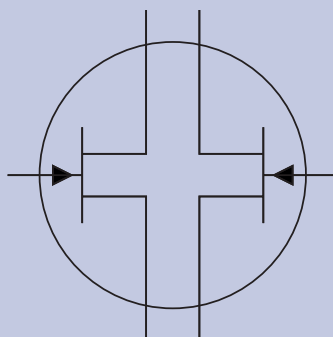


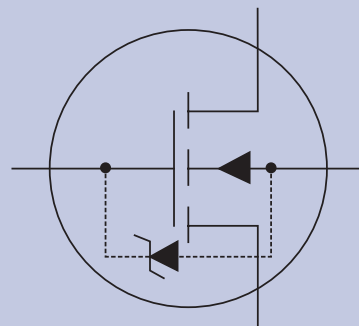
*Linear Integrated Systems*

**SMALL SIGNAL  
DISCRETE SEMICONDUCTORS**

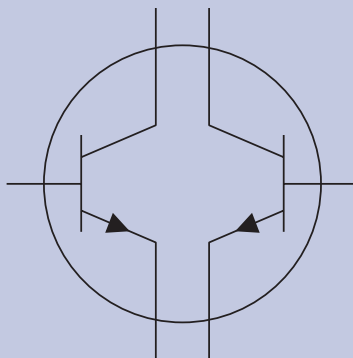
*JFETs*



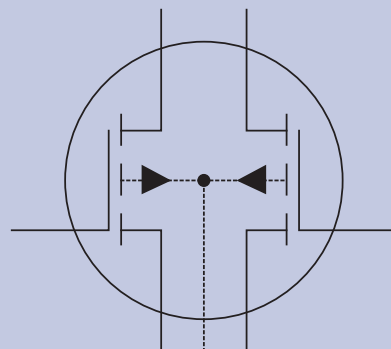
*DMOS Switches*



*BJTs*



*MOSFETs*



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# Introduction

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Linear Integrated Systems is a U.S.-based, full-service semiconductor manufacturer of specialty linear products. Since 1987, we have been supplying pin-for-pin replacements for over 2,000 discrete devices which are currently offered or were discontinued by Interfet, Intersil, Micro Power Systems, Motorola, National, Fairchild, Phillips, and Siliconix-Vishay. We strive to provide our customers with the necessary options, solutions, and technology to produce leadership end products.

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## Product Line Highlights

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### Lateral DMOS Switches

- Ultra Fast Switching ( $t_{ON}=1\text{ns typ}$ )
- N-Channel Enhancement Mode
- Single and Monolithic Quad Packages
- Available with Internal ESD Protection Diodes
- Low Capacitance ( $C_{rss}=0.5\text{pf max}$ )
- Additional Screening Available
- Second Source for Siliconix

### BJTs:

- NPN and PNP
- Tight Matching ( $\Delta V_{BE}=0.5\text{mV max}$ )
- Single and Monolithic Dual Packages
- General Purpose Versions ( $BV_{CEO}=25\text{-}60\text{V min}$ )
- Log Conformance Versions ( $r_e=1.5\Omega \text{ max}$ )
- Super Beta Versions ( $\beta=1000\text{-}2000 \text{ min}$ )
- Additional Screening Available
- Second Source for ADI, Intersil, Motorola, & National

### BiFET Amplifier:

- Monolithic: P-Channel MOSFET Input & NPN Driver
- High Input Impedance ( $R_{gs}=100\text{G}\Omega \text{ min}$ )
- Low Noise ( $e_n=25\mu\text{V typ}$ )
- High Gain ( $Y_{fs}=30,000\mu\text{S min}$ )

### Current Regulating Diodes:

- Nominal Current From 0.192 to 5.6mA
- Biasing Not Required
- Second Source for Siliconix

### JFETs:

- Single and Monolithic Dual Packages
- N-Channel and P-Channel Amplifiers
- Tight Matching ( $\Delta V_{gs}=0.1\text{mV max}$ )
- Ultra Low Noise Versions ( $e_n=3\text{nv}/\sqrt{\text{hz typ}}$ )
- High Frequency Versions
- High Impedance Versions ( $I_G=0.2\text{pA typ}$ )
- Low Leakage Versions ( $I_{GSS}=1\text{pA max}$ )
- N and P Channel Single Switches
- Additional Screening Available
- Second Source for Motorola, National, & Siliconix

### Low Leakage Diodes:

- Low Leakage Current ( $I_R=1 \text{ to } 500\text{pA}$ )
- Single and Monolithic Dual Packages
- Second Source for Intersil, National, & Siliconix

### MOSFETs:

- P-Channel: Single and Monolithic Dual Packages
- N-Channel: Single Packages
- Enhancement Mode Amplifiers
- Second Source for Intersil & Siliconix

### Photo FET

- Light Sensitive N-Channel JFET
- Second Source for Crystalonics

### Voltage Controlled Resistor:

- Monolithic Dual N-Channel JFET
- Second Source for Siliconix

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## Contacts

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To receive sales literature, quotations, samples, spice models, and technical support, please visit our website at <http://www.linearsystems.com>, or contact the Linear Integrated Systems world wide sales office:

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Tel: 510-490-9160

Fax: 510-353-0261

Email: [sales@linearsystems.com](mailto:sales@linearsystems.com)

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## Life Support Application Policy

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LIS products are not sold for applications in any medical equipment intended for use as a component of any life support system unless a specific written agreement pertaining to such intended use is executed between the manufacturer and LIS.

# Junction Field Effect Transistors

## Monolithic Dual Amplifiers

### N Channel

| P/N | $e_n$<br>nV/ $\sqrt{\text{Hz}}$<br>max | $\Delta V_{GS}$<br>mV<br>max | $BV_{GSS}$<br>V<br>min | $I_{DSS}$<br>mA<br>min | $I_{GSS}$<br>pA<br>max | $g_{fs}$<br>$\mu\text{S}$<br>min | PKG. |
|-----|--|------------------------------|------------------------|------------------------|------------------------|----------------------------------|------|
|-----|--|------------------------------|------------------------|------------------------|------------------------|----------------------------------|------|

### LOW NOISE

|       |    |    |     |     |      |      |                |
|-------|----|----|-----|-----|------|------|----------------|
| LS840 | 10 | 5  | -60 | 0.5 | -100 | 1000 | K1,K3,K5,K7,K8 |
| LS841 | 10 | 10 | -60 | 2   | -100 | 1000 | K1,K3,K5,K7,K8 |
| LS842 | 10 | 25 | -60 | 5   | -100 | 1000 | K1,K3,K5,K7,K8 |
| LS843 | 7  | 1  | -60 | 1.5 | -100 | 1500 | K1,K3,K5,K7,K8 |
| LS844 | 7  | 5  | -60 | 5   | -100 | 1500 | K1,K3,K5,K7,K8 |
| LS845 | 7  | 15 | -60 | 15  | -100 | 1500 | K1,K3,K5,K7,K8 |

### ULTRA LOW NOISE

|         |     |    |     |        |      |      |          |
|---------|-----|----|-----|--------|------|------|----------|
| LSK389A | 2.5 | 20 | -40 | 2-6    | -200 | 8000 | K1,K5,K7 |
| LSK389B | 2.5 | 20 | -40 | 6-10   | -200 | 8000 | K1,K5,K7 |
| LSK389C | 2.5 | 20 | -40 | 10-20  | -200 | 8000 | K1,K5,K7 |
| LSK389D | 2.5 | 20 | -40 | 20-30  | -200 | 8000 | K1,K5,K7 |
| LSK489  | 3.0 | 20 | -60 | 2.5-15 | -100 | 1500 | K1,K5,K7 |

### HIGH FREQUENCY

|             |    |    |     |   |      |      |                          |
|-------------|----|----|-----|---|------|------|--------------------------|
| 2N/SST5911  | 20 | 10 | -25 | 7 | -50  | 4000 | K1,K3,K4,<br>K5,K6,K7,K8 |
| 2N/SST5912  | 20 | 15 | -25 | 7 | -50  | 4000 | K1,K3,K4,<br>K5,K6,K7,K8 |
| 2N/SST5912C | 20 | 40 | -25 | 7 | -50  | 4000 | K1,K3,K4,<br>K5,K6,K7,K8 |
| U/SST440    | 20 | 10 | -25 | 6 | -500 | 4500 | K1,K6                    |
| U/SST441    | 20 | 20 | -25 | 6 | -500 | 4500 | K1,K6                    |

### LOW LEAKAGE / HIGH IMPEDANCE

|        |    |    |     |      |      |     |                |
|--------|----|----|-----|------|------|-----|----------------|
| LS830  | 70 | 25 | -40 | 0.06 | -1.0 | 70  | K1,K3,K5,K7,K8 |
| LS831  | 70 | 25 | -40 | 0.06 | -1.0 | 70  | K1,K3,K5,K7,K8 |
| LS832  | 70 | 25 | -40 | 0.06 | -1.0 | 70  | K1,K3,K5,K7,K8 |
| LS833  | 70 | 25 | -40 | 0.06 | -1.0 | 70  | K1,K3,K5,K7,K8 |
| LS5905 | 70 | 15 | -40 | 0.06 | -5.0 | 70  | K1,K3,K5,K7,K8 |
| LS5906 | 70 | 5  | -40 | 0.06 | -2.0 | 70  | K1,K3,K5,K7,K8 |
| LS5907 | 70 | 5  | -40 | 0.06 | -2.0 | 70  | K1,K3,K5,K7,K8 |
| LS5908 | 70 | 10 | -40 | 0.06 | -2.0 | 70  | K1,K3,K5,K7,K8 |
| LS5909 | 70 | 15 | -40 | 0.06 | -2.0 | 70  | K1,K3,K5,K7,K8 |
| U421   | 70 | 10 | -40 | 0.06 | -1.0 | 300 | K2,K3,K5       |
| U422   | 70 | 15 | -40 | 0.06 | -1.0 | 300 | K2,K3,K5       |
| U423   | 70 | 25 | -40 | 0.06 | -1.0 | 300 | K2,K3,K5       |
| U424   | 70 | 10 | -40 | 0.06 | -3.0 | 300 | K2,K3,K5       |
| U425   | 70 | 15 | -40 | 0.06 | -3.0 | 300 | K2,K3,K5       |
| U426   | 70 | 25 | -40 | 0.06 | -3.0 | 300 | K2,K3,K5       |

### GENERAL PURPOSE

|          |    |    |     |        |      |      |                |
|----------|----|----|-----|--------|------|------|----------------|
| U/SST401 | 20 | 5  | -50 | 0.5    | -100 | 2000 | K1,K4,K6,K7,K8 |
| U/SST402 | 20 | 10 | -50 | 0.5    | -100 | 2000 | K1,K4,K6,K7,K8 |
| U/SST403 | 20 | 10 | -50 | 0.5    | -100 | 2000 | K1,K4,K6,K7,K8 |
| U/SST404 | 20 | 15 | -50 | 0.5    | -100 | 2000 | K1,K4,K6,K7,K8 |
| U/SST405 | 20 | 20 | -50 | 0.5    | -100 | 2000 | K1,K4,K6,K7,K8 |
| U/SST406 | 20 | 40 | -50 | 0.5    | -100 | 2000 | K1,K4,K6,K7,K8 |
| 2N3954   | 15 | 5  | -60 | 0.5    | -100 | 1000 | K1,K3,K5,K7,K8 |
| 2N3954A  | 15 | 5  | -60 | 0.5    | -100 | 1000 | K1,K3,K5,K7,K8 |
| 2N3955   | 15 | 10 | -60 | 0.5    | -100 | 1000 | K1,K3,K5,K7,K8 |
| 2N3956   | 15 | 15 | -60 | 0.5    | -100 | 1000 | K1,K3,K5,K7,K8 |
| 2N3958   | 15 | 25 | -60 | 0.5    | -100 | 1000 | K1,K3,K5,K7,K8 |
| LSK589   | -  | 20 | -40 | 2.6-30 | -200 | 8000 | K1,K5,K7       |

### PChannel

### ULTRA LOW NOISE

|        |     |    |     |        |      |      |          |
|--------|-----|----|-----|--------|------|------|----------|
| LSJ689 | 3.5 | 20 | -50 | 2.5-30 | -100 | 1500 | K1,K5,K7 |
|--------|-----|----|-----|--------|------|------|----------|

# Junction Field Effect Transistors Cont'd

## Single Amplifiers

### N Channel

| P/N                                 | $e_n$<br>nV/ $\sqrt{\text{Hz}}$<br>typ | $V_{GS(off)}$<br>V<br>max | $BV_{GSS}$<br>V<br>min | $I_{DSS}$<br>mA<br>min | $I_{GSS}$<br>pA<br>max | $g_{fs}$<br>$\mu\text{S}$<br>min | PKG.     |
|-------------------------------------|--|---------------------------|------------------------|------------------------|------------------------|----------------------------------|----------|
| <b>LOW NOISE</b>                    |  |                           |                        |                        |                        |                                  |          |
| J/SST201                            | 6                                      | -1.5                      | -40                    | 0.2                    | -100                   | 500                              | F4,F7    |
| J/SST202                            | 6                                      | -4.0                      | -40                    | 0.9                    | -100                   | 1000                             | F4,F7    |
| LS846                               | 11                                     | -3.5                      | -60                    | 1.5                    | -100                   | 1000                             | F4,F7    |
| <b>ULTRA LOW NOISE</b>              |  |                           |                        |                        |                        |                                  |          |
| LSK170A                             | 2.5                                    | -2                        | -40                    | 2.6-6.5                | -1                     | 22000                            | F4,F7    |
| LSK170B                             | 2.5                                    | -2                        | -40                    | 6-12                   | -1                     | 22000                            | F4,F7    |
| LSK170C                             | 2.5                                    | -2                        | -40                    | 10-20                  | -1                     | 22000                            | F4,F7    |
| LSK170D                             | 2.5                                    | -2                        | -40                    | 18-30                  | -1                     | 22000                            | F4,F7    |
| LSK189                              | 3.5                                    | -3.5                      | -60                    | 2.5-15                 | -0.1                   | 1500                             | F4,F7    |
| <b>HIGH FREQUENCY</b>               |  |                           |                        |                        |                        |                                  |          |
| 2N/PN/SST4416                       | 6                                      | -6.0                      | -30                    | 5                      | -100                   | 4500                             | F3,F6,F7 |
| 2N/PN/SST4416A                      | 6                                      | -6.0                      | -35                    | 5                      | -100                   | 4500                             | F3,F6,F7 |
| J/SST210                            | 10                                     | -3.0                      | -25                    | 2                      | -100                   | 4000                             | F4,F7    |
| J/SST211                            | 10                                     | -4.5                      | -25                    | 7                      | -100                   | 6000                             | F4,F7    |
| J/SST212                            | 10                                     | -6.0                      | -25                    | 15                     | -100                   | 7000                             | F4,F7    |
| J/SST/U308                          | 6                                      | -6.5                      | -25                    | 12                     | -1000                  | 8000                             | F1,F4,F7 |
| J/SST/U309                          | 6                                      | -4.0                      | -25                    | 12                     | -1000                  | 10000                            | F1,F4,F7 |
| J/SST/U310                          | 6                                      | -6.5                      | -25                    | 24                     | -1000                  | 8000                             | F1,F4,F7 |
| <b>LOW LEAKAGE / HIGH IMPEDANCE</b> |  |                           |                        |                        |                        |                                  |          |
| 2N/PN/SST4117                       | 15                                     | -1.8                      | -40                    | 0.03                   | -10                    | 70                               | F3,F4,F7 |
| 2N/PN/SST4117A                      | 15                                     | -1.8                      | -40                    | 0.03                   | -1                     | 70                               | F3,F4,F7 |
| 2N/PN/SST4118                       | 15                                     | -3.0                      | -40                    | 0.08                   | -10                    | 80                               | F3,F4,F7 |
| 2N/PN/SST4118A                      | 15                                     | -3.0                      | -40                    | 0.08                   | -1                     | 80                               | F3,F4,F7 |
| 2N/PN/SST4119                       | 15                                     | -6.0                      | -40                    | 0.20                   | -10                    | 100                              | F3,F4,F7 |
| 2N/PN/SST4119A                      | 15                                     | -6.0                      | -40                    | 0.20                   | -1                     | 100                              | F3,F4,F7 |
| 2N/PF5301                           | 45                                     | -3.0                      | -30                    | 0.03                   | -1                     | 70                               | F3,F4    |
| <b>GENERAL PURPOSE</b>              |  |                           |                        |                        |                        |                                  |          |
| LSK190                              | -                                      | -2                        | -40                    | 2.6-30                 | -1                     | 22000                            | F4,F7    |

### P Channel

| P/N                    | $e_n$<br>nV/ $\sqrt{\text{Hz}}$<br>typ | $V_{GS(off)}$<br>V<br>max | $BV_{GSS}$<br>V<br>min | $I_{DSS}$<br>mA<br>min | $I_{GSS}$<br>pA<br>max | $g_{fs}$<br>$\mu\text{S}$<br>min | PKG.            |
|------------------------|--|---------------------------|------------------------|------------------------|------------------------|----------------------------------|-----------------|
| <b>ULTRA LOW NOISE</b> |  |                           |                        |                        |                        |                                  |                 |
| LSJ74A                 | 4                                      | -2                        | -25                    | 2.6-6.5                | -1                     | 22000                            | F4,F(SOT89-New) |
| LSJ74B                 | 4                                      | -2                        | -25                    | 6-12                   | -1                     | 22000                            | F4,F(SOT89-New) |
| LSJ74C                 | 4                                      | -2                        | -25                    | 10-20                  | -1                     | 22000                            | F4,F(SOT89-New) |
| LSJ74D                 | 4                                      | -2                        | -25                    | 18-30                  | -1                     | 22000                            | F4,F(SOT89-New) |
| <b>GENERAL PURPOSE</b> |  |                           |                        |                        |                        |                                  |                 |
| LSJ94                  | -2                                     | -25                       | 2.6-6.5                | -1                     | 22000                  | F4,F(SOT89-New)                  |                 |

## Single Switches

| P/N              | $R_{DS(on)}$<br>$\Omega$<br>max | $V_{GS(off)}$<br>V<br>max | $I_{DSS}$<br>mA<br>min | $I_{GSS}$<br>pA<br>max | $BV_{GSS}$<br>V<br>min | $C_{RSS}$<br>pF<br>max | PKG.     |
|------------------|---------------------------------|---------------------------|------------------------|------------------------|------------------------|------------------------|----------|
| <b>N-CHANNEL</b> |                                 |                           |                        |                        |                        |                        |          |
| 2N/PN/SST4391    | 30                              | -10                       | 50                     | -100                   | -40                    | 3.5                    | F1,F4,F7 |
| 2N/PN/SST4392    | 60                              | -5                        | 25                     | -100                   | -40                    | 3.5                    | F1,F4,F7 |
| 2N/PN/SST4393    | 100                             | -3                        | 5                      | -100                   | -40                    | 3.5                    | F1,F4,F7 |
| J/SST108         | 8                               | -10                       | 80                     | -3000                  | -25                    | 15                     | F4,F7    |
| J/SST109         | 12                              | -6                        | 40                     | -3000                  | -25                    | 15                     | F4,F7    |
| J/SST110         | 15                              | -4                        | 10                     | -3000                  | -25                    | 15                     | F4,F7    |
| J/SST111         | 30                              | -10                       | 20                     | -1000                  | -35                    | 5                      | F4,F7    |
| J/SST112         | 50                              | -5                        | 5                      | -1000                  | -35                    | 5                      | F4,F7    |
| J/SST113         | 100                             | -3                        | 2                      | -1000                  | -35                    | 5                      | F4,F7    |
| <b>P-CHANNEL</b> |                                 |                           |                        |                        |                        |                        |          |
| 2N5018           | 75                              | 10                        | -10                    | 2000                   | 30                     | 7                      | F2       |
| 2N5019           | 150                             | 5                         | -5                     | 2000                   | 30                     | 7                      | F2       |
| 2N5114           | 75                              | 10                        | -30                    | 500                    | 30                     | 7                      | F2       |
| 2N5115           | 100                             | 6                         | -15                    | 500                    | 30                     | 7                      | F2       |
| 2N5116           | 150                             | 4                         | -5                     | 500                    | 30                     | 7                      | F2       |
| J/SST174         | 85                              | 10                        | -20                    | 1000                   | 30                     | 7                      | F5,F9    |
| J/SST175         | 125                             | 6                         | -7                     | 1000                   | 30                     | 7                      | F5,F9    |
| J/SST176         | 250                             | 4                         | -2                     | 1000                   | 30                     | 7                      | F5,F9    |
| J/SST177         | 300                             | 2.25                      | -1.5                   | 1000                   | 30                     | 7                      | F5,F9    |

# Field Effect Transistors

## Lateral DMOS FET Switches

### N Channel Enhancement Mode

| P/N | $R_{DS(on)}$<br>$\Omega$<br>max | $t_{ON}$<br>ns<br>max | $BV_{DS}$<br>V<br>min | $C_{RSS}$<br>pF<br>max | Protection<br>Diode | PKG. |
|-----|---------------------------------|-----------------------|-----------------------|------------------------|---------------------|------|
|-----|---------------------------------|-----------------------|-----------------------|------------------------|---------------------|------|

#### SINGLE

|         |     |     |    |     |     |    |
|---------|-----|-----|----|-----|-----|----|
| SD210DE | 45  | 2.0 | 30 | 0.5 | NO  | L7 |
| SD211DE | 45  | 2.0 | 30 | 0.5 | YES | L6 |
| SD213DE | 45  | 2.0 | 10 | 0.5 | YES | L6 |
| SD214DE | 45  | 2.0 | 20 | 0.5 | NO  | L7 |
| SD215DE | 45  | 2.0 | 20 | 0.5 | YES | L6 |
| SST210  | 50  | 2.0 | 30 | 0.5 | NO  | L5 |
| SST211  | 50  | 2.0 | 30 | 0.5 | YES | L4 |
| SST213  | 50  | 2.0 | 10 | 0.5 | YES | L4 |
| SST214  | 50  | 2.0 | 20 | 0.5 | NO  | L5 |
| SST215  | 50  | 2.0 | 20 | 0.5 | YES | L4 |
| SST823  | 5.0 | 2.0 | 25 | 5.0 | YES | L4 |
| SST824  | 5.0 | 2.0 | 25 | 5.0 | YES | L4 |

#### MONOLITHIC QUAD

|          |    |     |    |     |     |          |
|----------|----|-----|----|-----|-----|----------|
| SD5000I  | 70 | 2.0 | 20 | 0.5 | YES | L2       |
| SD5000N  | 70 | 2.0 | 20 | 0.5 | YES | L1,L8,L9 |
| SD5001N  | 70 | 2.0 | 10 | 0.5 | YES | L1,L8,L9 |
| SD5400CY | 75 | 2.0 | 20 | 0.5 | YES | L3       |
| SD5401CY | 75 | 2.0 | 10 | 0.5 | YES | L3       |

## MOSFETs

### N & P Channel Enhancement Mode

| P/N | $V_{GS(TH)}$<br>V<br>min | $BV_{DS}$<br>V<br>min | $R_{DS(on)}$<br>$\Omega$<br>max | $I_{D(on)}$<br>mA<br>min | $I_{GSS}$<br>pA<br>max | CH. | PKG. |
|-----|--------------------------|-----------------------|---------------------------------|--------------------------|------------------------|-----|------|
|-----|--------------------------|-----------------------|---------------------------------|--------------------------|------------------------|-----|------|

#### SINGLE

|        |      |     |     |    |          |   |    |
|--------|------|-----|-----|----|----------|---|----|
| 2N4351 | 1.0  | 25  | 300 | 3  | 10       | N | M2 |
| 2N4352 | 1.0  | 25  | 300 | 3  | 10       | N | M2 |
| 3N163  | -3.0 | -40 | 250 | -5 | $\pm 10$ | P | M1 |
| 3N164  | -3.0 | -30 | 300 | -3 | $\pm 10$ | P | M1 |
| 3N170  | 1.0  | 25  | 200 | 10 | 10       | N | M2 |
| 3N171  | 1.5  | 25  | 200 | 10 | 10       | N | M2 |

#### MONOLITHIC DUAL

|       |      |     |     |    |          |   |    |
|-------|------|-----|-----|----|----------|---|----|
| 3N165 | -2.0 | -40 | 300 | -5 | $\pm 10$ | P | M3 |
| 3N166 | -2.0 | -30 | 300 | -5 | $\pm 10$ | P | M3 |
| 3N190 | -2.0 | -30 | 300 | -5 | $\pm 10$ | P | M4 |
| 3N191 | -2.0 | -30 | 300 | -5 | $\pm 10$ | P | M4 |

# Bipolar Junction Transistors

## Monolithic Dual NPN

| P/N | $h_{FE}$<br>min | $\Delta V_{BE}$<br>mV<br>max | $BV_{CBO}$<br>V<br>min | $I_C$<br>mA<br>max | $C_{OBO}$<br>pF<br>max | $f_t$<br>MHz<br>min | PKG. |
|-----|-----------------|------------------------------|------------------------|--------------------|------------------------|---------------------|------|
|-----|-----------------|------------------------------|------------------------|--------------------|------------------------|---------------------|------|

|         |      |     |    |     |   |     |                |
|---------|------|-----|----|-----|---|-----|----------------|
| IT120A  | 225  | 1   | 45 | 10  | 2 | 220 | B1,B2,B3,B4,B7 |
| IT120   | 225  | 2   | 45 | 10  | 2 | 220 | B1,B2,B3,B4,B7 |
| IT121   | 100  | 3   | 45 | 10  | 2 | 180 | B1,B2,B3,B4,B7 |
| IT122   | 100  | 5   | 45 | 10  | 2 | 180 | B1,B2,B3,B4,B7 |
| IT124   | 1500 | 5   | 2  | 10  | 2 | 100 | B1,B2,B3,B4,B7 |
| LS310   | 150  | 3   | 25 | 10  | 2 | 200 | B1,B2,B3,B4,B7 |
| LS311   | 150  | 1   | 45 | 10  | 2 | 200 | B1,B2,B3,B4,B7 |
| LS312   | 200  | 0.5 | 60 | 10  | 2 | 200 | B1,B2,B3,B4,B7 |
| LS313   | 400  | 1   | 45 | 10  | 2 | 200 | B1,B2,B3,B4,B7 |
| LS3250A | 150  | 2   | 45 | 150 | 2 | 600 | B1,B2,B3,B4,B7 |
| LS3250B | 100  | 5   | 40 | 150 | 2 | 600 | B1,B2,B3,B4,B7 |
| LS3250C | 50   | 10  | 20 | 150 | 2 | 600 | B1,B2,B3,B4,B7 |

## Single NPN

| P/N | $h_{FE}$<br>@1mA<br>min | $h_{FE}$<br>@10mA<br>min | $BV_{CBO}$<br>V<br>min | $I_C$<br>mA<br>max | $C_{OBO}$<br>pF<br>max | $f_t$<br>MHz<br>min | PKG. |
|-----|-------------------------|--------------------------|------------------------|--------------------|------------------------|---------------------|------|
|-----|-------------------------|--------------------------|------------------------|--------------------|------------------------|---------------------|------|

|          |     |     |    |     |   |     |       |
|----------|-----|-----|----|-----|---|-----|-------|
| LS3250SA | 150 | 120 | 45 | 150 | 2 | 600 | B5,B6 |
| LS3250SB | 100 | 80  | 40 | 150 | 2 | 600 | B5,B6 |
| LS3250SC | 50  | 40  | 20 | 150 | 2 | 600 | B5,B6 |

## Monolithic Dual NPN Super Beta

| P/N | $h_{FE}$<br>min | $\Delta V_{BE}$<br>mV<br>max | $BV_{CBO}$<br>V<br>min | $I_C$<br>mA<br>max | $C_{OBO}$<br>pF<br>max | $f_t$<br>MHz<br>min | PKG. |
|-----|-----------------|------------------------------|------------------------|--------------------|------------------------|---------------------|------|
|-----|-----------------|------------------------------|------------------------|--------------------|------------------------|---------------------|------|

|       |      |   |    |   |   |     |                |
|-------|------|---|----|---|---|-----|----------------|
| LS301 | 2000 | 1 | 18 | 5 | 2 | 100 | B1,B2,B3,B4,B7 |
| LS302 | 1000 | 1 | 35 | 5 | 2 | 100 | B1,B2,B3,B4,B7 |
| LS303 | 2000 | 1 | 10 | 5 | 2 | 100 | B1,B2,B3,B4,B7 |

## Monolithic Dual PNP

| P/N | $h_{FE}$<br>min | $\Delta V_{BE}$<br>mV<br>max | $BV_{CBO}$<br>V<br>min | $I_C$<br>mA<br>max | $C_{OBO}$<br>pF<br>max | $f_t$<br>MHz<br>min | PKG. |
|-----|-----------------|------------------------------|------------------------|--------------------|------------------------|---------------------|------|
|-----|-----------------|------------------------------|------------------------|--------------------|------------------------|---------------------|------|

|         |     |     |     |     |   |     |                |
|---------|-----|-----|-----|-----|---|-----|----------------|
| IT130A  | 225 | 1   | -45 | -10 | 2 | 110 | B1,B2,B3,B4,B7 |
| IT130   | 225 | 2   | -45 | -10 | 2 | 110 | B1,B2,B3,B4,B7 |
| IT131   | 100 | 3   | -45 | -10 | 2 | 90  | B1,B2,B3,B4,B7 |
| IT132   | 100 | 5   | -45 | -10 | 2 | 90  | B1,B2,B3,B4,B7 |
| LS350   | 100 | 5   | -25 | -10 | 2 | 200 | B1,B2,B3,B4,B7 |
| LS351   | 150 | 1   | -45 | -10 | 2 | 200 | B1,B2,B3,B4,B7 |
| LS352   | 200 | 0.5 | -60 | -10 | 2 | 200 | B1,B2,B3,B4,B7 |
| LS3550A | 150 | 2   | -45 | -50 | 2 | 600 | B1,B2,B3,B4,B7 |
| LS3550B | 100 | 5   | -40 | -50 | 2 | 600 | B1,B2,B3,B4,B7 |
| LS3550C | 50  | 10  | -20 | -50 | 2 | 600 | B1,B2,B3,B4,B7 |

## Single PNP

| P/N | $h_{FE}$<br>@1mA<br>min | $h_{FE}$<br>@10mA<br>min | $BV_{CBO}$<br>V<br>min | $I_C$<br>mA<br>max | $C_{OBO}$<br>pF<br>max | $f_t$<br>MHz<br>min | PKG. |
|-----|-------------------------|--------------------------|------------------------|--------------------|------------------------|---------------------|------|
|-----|-------------------------|--------------------------|------------------------|--------------------|------------------------|---------------------|------|

|          |     |     |     |     |   |     |       |
|----------|-----|-----|-----|-----|---|-----|-------|
| LS3550SA | 150 | 120 | -45 | -50 | 2 | 600 | B5,B6 |
| LS3550SB | 100 | 80  | -40 | -50 | 2 | 600 | B5,B6 |
| LS3550SC | 50  | 40  | -20 | -50 | 2 | 600 | B5,B6 |

## Monolithic Dual Log Conformance

| P/N | $h_{FE}$<br>min | $r_e$<br>$\Omega$ | $\Delta V_{BE}$<br>mV<br>max | $BV_{CBO}$<br>V<br>min | $I_C$<br>mA<br>max | Type | PKG. |
|-----|-----------------|-------------------|------------------------------|------------------------|--------------------|------|------|
|-----|-----------------|-------------------|------------------------------|------------------------|--------------------|------|------|

|       |     |     |   |     |     |     |                |
|-------|-----|-----|---|-----|-----|-----|----------------|
| LS318 | 150 | 1.5 | 1 | 25  | 10  | NPN | B1,B2,B3,B4,B7 |
| LS358 | 100 | 1.5 | 1 | -20 | -10 | PNP | B1,B2,B3,B4,B7 |

# Other Discrete Devices

## Low Leakage Diodes

| P/N           | $I_R$<br>pA<br>max | $V_F$<br>V<br>typ | $BV_R$<br>V<br>min | $C_R$<br>pF<br>max | PKG. |
|---------------|--------------------|-------------------|--------------------|--------------------|------|
| <b>SINGLE</b> |                    |                   |                    |                    |      |
| JPAD5         | -5                 | 0.8               | -35                | 2                  | D1   |
| JPAD10        | -10                | 0.8               | -35                | 2                  | D1   |
| JPAD20        | -20                | 0.8               | -35                | 2                  | D1   |
| JPAD50        | -50                | 0.8               | -35                | 2                  | D1   |
| JPAD100       | -100               | 0.8               | -35                | 2                  | D1   |
| JPAD200       | -200               | 0.8               | -35                | 2                  | D1   |
| JPAD500       | -500               | 0.8               | -35                | 2                  | D1   |
| PAD1          | -1                 | 0.8               | -45                | 0.8                | D2   |
| PAD2          | -2                 | 0.8               | -45                | 0.8                | D2   |
| PAD5          | -5                 | 0.8               | -45                | 0.8                | D2   |
| PAD10         | -10                | 0.8               | -35                | 2                  | D2   |
| PAD20         | -20                | 0.8               | -35                | 2                  | D2   |
| PAD50         | -50                | 0.8               | -35                | 2                  | D2   |
| PAD100        | -100               | 0.8               | -35                | 2                  | D2   |
| SSTPAD5       | -5                 | 0.8               | -30                | 2                  | D7   |
| SSTPAD10      | -10                | 0.8               | -30                | 2                  | D7   |
| SSTPAD20      | -20                | 0.8               | -30                | 2                  | D7   |
| SSTPAD50      | -50                | 0.8               | -30                | 2                  | D7   |

### MONOLITHIC DUAL

|           |      |     |     |     |    |
|-----------|------|-----|-----|-----|----|
| DPAD1     | -1   | 0.8 | -45 | 0.8 | D4 |
| DPAD2     | -2   | 0.8 | -45 | 2   | D3 |
| DPAD5     | -5   | 0.8 | -45 | 2   | D3 |
| DPAD10    | -10  | 0.8 | -45 | 2   | D3 |
| DPAD20    | -20  | 0.8 | -45 | 2   | D3 |
| DPAD50    | -50  | 0.8 | -45 | 2   | D3 |
| DPAD100   | -100 | 0.8 | -45 | 2   | D3 |
| ID100     | -10  | 0.8 | -30 | 1   | D5 |
| ID101     | -10  | 0.8 | -30 | 1   | D6 |
| SSTDPAD5  | -5   | 0.8 | -30 | 4   | D8 |
| SSTDPAD10 | -10  | 0.8 | -30 | 4   |    |

## Current Regulators

| P/N      | $I_F$<br>mA<br>min | $I_F$<br>mA<br>max | $V_L$<br>V<br>max | $P_{OV}$<br>V<br>min | $Z_d$<br>M $\Omega$<br>typ | $Z_k$<br>M $\Omega$<br>typ | PKG.  |
|----------|--------------------|--------------------|-------------------|----------------------|----------------------------|----------------------------|-------|
| J/SST500 | 0.192              | 0.288              | 1.2               | 50                   | 15                         | 2.5                        | F7,F8 |
| J/SST501 | 0.264              | 0.396              | 1.3               | 50                   | 10                         | 1.6                        | F7,F8 |
| J/SST502 | 0.344              | 0.516              | 1.5               | 50                   | 7.0                        | 1.1                        | F7,F8 |
| J/SST503 | 0.448              | 0.672              | 1.7               | 50                   | 5.0                        | 0.8                        | F7,F8 |
| J/SST504 | 0.600              | 0.900              | 1.9               | 50                   | 3.5                        | 0.55                       | F7,F8 |
| J/SST505 | 0.800              | 1.200              | 2.1               | 50                   | 2.0                        | 0.40                       | F7,F8 |
| J/SST506 | 1.120              | 1.680              | 2.5               | 50                   | 1.5                        | 0.25                       | F7,F8 |
| J/SST507 | 1.440              | 2.160              | 2.8               | 50                   | 1.0                        | 0.19                       | F7,F8 |
| J/SST508 | 1.900              | 2.900              | 3.1               | 50                   | 0.7                        | 0.13                       | F7,F8 |
| J/SST509 | 2.400              | 3.600              | 3.5               | 50                   | 0.5                        | 0.09                       | F7,F8 |
| J/SST510 | 2.900              | 4.300              | 3.9               | 50                   | 0.4                        | 0.07                       | F7,F8 |
| J/SST511 | 3.800              | 5.600              | 4.2               | 50                   | 0.3                        | 0.05                       | F7,F8 |

## Voltage Controlled Resistor

| P/N    | $V_{GS(off)}$<br>V<br>min | $BV_{GSS}$<br>V<br>min | $r_{ds(on)}$<br>$\Omega$<br>min | $r_{ds(on)}$<br>$\Omega$<br>max | PKG. |
|--------|---------------------------|------------------------|---------------------------------|---------------------------------|------|
| VCR11N | -8                        | -25                    | 70                              | 200                             | K1   |

## Photo FET

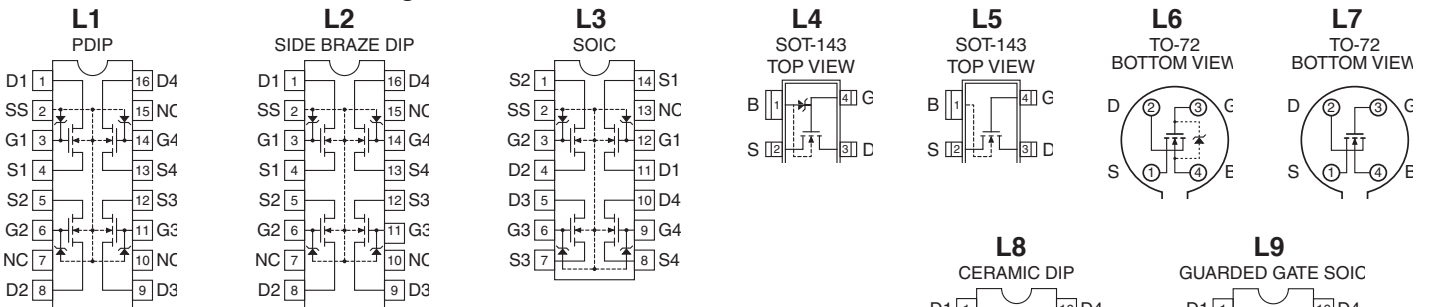
| P/N   | $V_{GS(off)}$<br>V<br>min | $I_{GSS}$<br>pA<br>max | $S_G$<br>$\mu\text{AmWcm}^2$<br>min | $R_{DS(on)}$<br>$\Omega$<br>typ | PKG. |
|-------|---------------------------|------------------------|-------------------------------------|---------------------------------|------|
| LS627 | -1                        | -30                    | 6.4                                 | 100                             | F3   |

## BiFET Amplifier

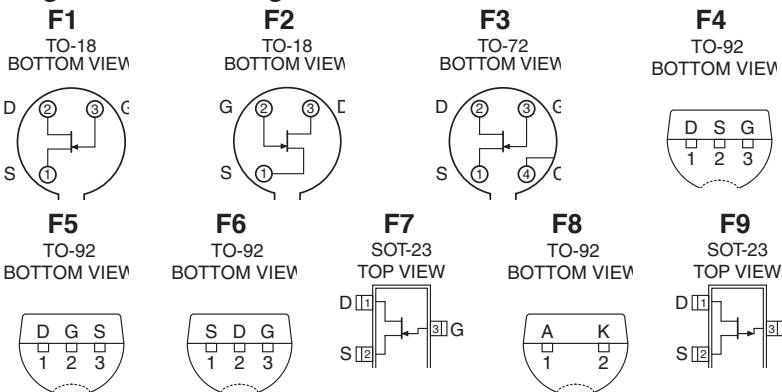
| P/N   | $V_{GS(off)}$<br>V<br>typ | $BV_{GSS}$<br>V<br>min | $e_n$<br>$\mu\text{V}$<br>typ | $g_{fs}$<br>$\mu\text{S}$<br>min | $C_{RS}$<br>pF<br>typ | PKG.     |
|-------|---------------------------|------------------------|-------------------------------|----------------------------------|-----------------------|----------|
| LS320 | -10                       | -20                    | 25                            | 30000                            | 1.5                   | A1,A2,A3 |

# Package Options

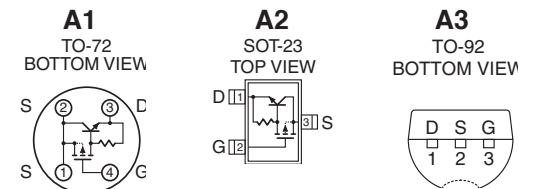
## Lateral DMOS Switch Packages



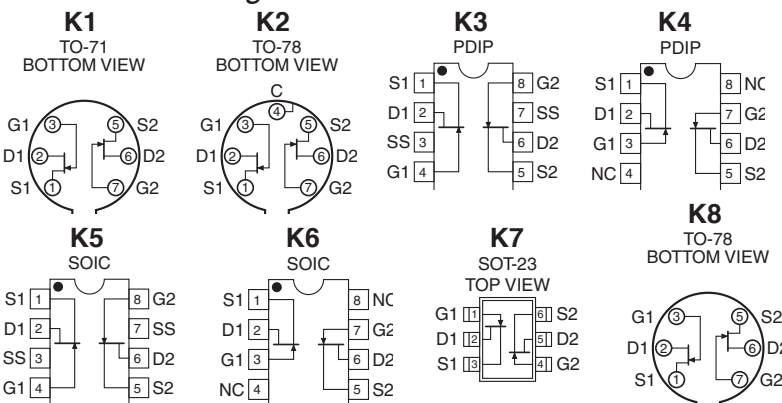
## Single JFET Packages



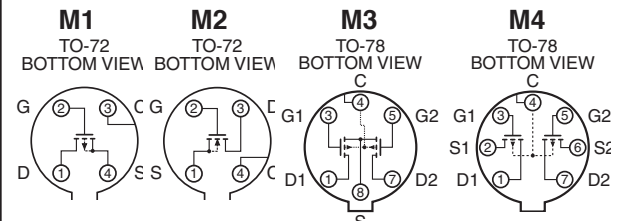
## BiFET Amplifier Packages



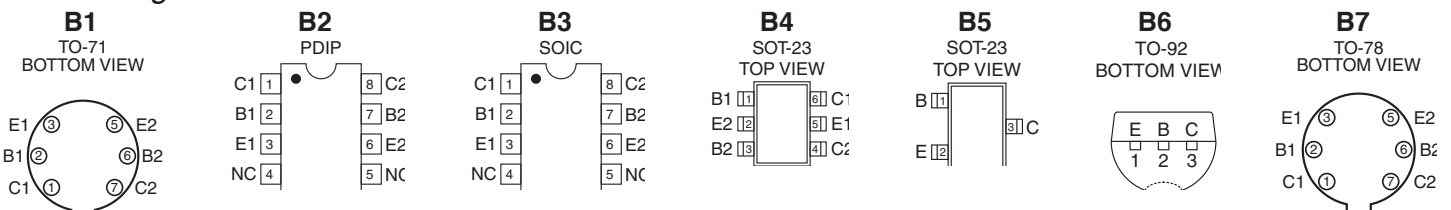
## Dual JFET Packages



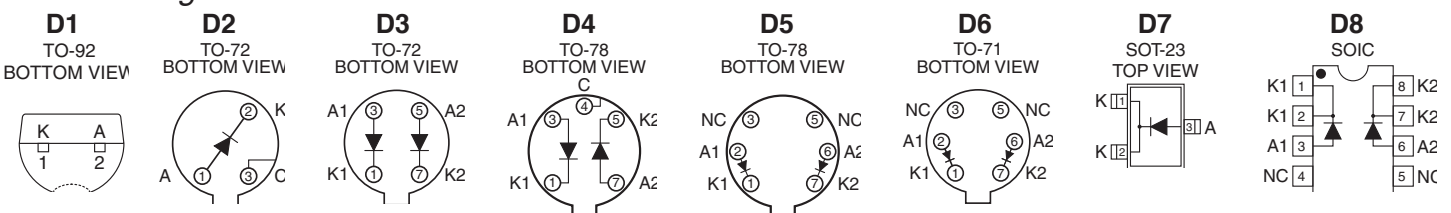
## MOSFET Packages



## BJT Packages



## Diode Packages





# Cross Reference Guide

| Industry # | LIS #  | Industry # | LIS #  | Industry # | LIS # | Industry # | LIS #   | Industry # | LIS #   | Industry # | LIS #  |
|------------|--------|------------|--------|------------|-------|------------|---------|------------|---------|------------|--------|
| 100S       | LS845  | 204S       | LS842  | 2N2920     | LS312 | 2N3517     | LS122   | 2N4021     | LS132   | 2N4937     | LS351  |
| 102M       | LS5912 | 2078A      | LS3955 | 2N2920A    | LS312 | 2N3521     | LS122   | 2N4022     | LS132   | 2N4937     | LS351  |
| 102S       | LS842  | 2079A      | LS3955 | 2N2936     | LS120 | 2N3522     | LS122   | 2N4023     | LS312   | 2N4938     | LS351  |
| 103M       | LS842  | 2080A      | LS841  | 2N2937     | LS120 | 2N3587     | LS122   | 2N4024     | LS312   | 2N4939     | LS351  |
| 103S       | LS842  | 2081A      | LS841  | 2N2972     | LS122 | 2N3608     | LS3N163 | 2N4025     | LS312   | 2N4940     | LS132  |
| 104M       | LS842  | 2098A      | LS841  | 2N2973     | LS122 | 2N3680     | LS120   | 2N4044     | LS312   | 2N4941     | LS131  |
| 105M       | LS842  | 2099A      | LS841  | 2N2974     | LS120 | 2N3684     | LS842   | 2N4045     | LS312   | 2N4942     | LS132  |
| 105U       | LS845  | 210U       | LS5912 | 2N2975     | LS120 | 2N3685     | LS842   | 2N4082     | LS3954  | 2N4955     | LS122  |
| 106M       | LS5912 | 2130U      | LS840  | 2N2976     | LS120 | 2N3686     | LS842   | 2N4083     | LS3955  | 2N4956     | LS122  |
| 107M       | LS5912 | 2132U      | LS3955 | 2N2977     | LS120 | 2N3687     | LS842   | 2N4084     | LS845   | 2N4977     | LSJ108 |
| 110U       | LS842  | 2134U      | LS3956 | 2N2978     | LS120 | 2N3726     | LS131   | 2N4085     | LS845   | 2N4978     | LSJ108 |
| 115U       | LS842  | 2136U      | LS3955 | 2N2979     | LS120 | 2N3727     | LS130   | 2N4091     | LS4391  | 2N4979     | LSJ110 |
| 120U       | LS842  | 2138U      | LS3958 | 2N2980     | LS121 | 2N3728     | LS122   | 2N4091A    | LS4391  | 2N5018     | LS4391 |
| 1227A      | LS842  | 2139U      | LS3958 | 2N2981     | LS122 | 2N3729     | LS121   | 2N4092     | LS4392  | 2N5019     | LS4391 |
| 125U       | LS842  | 2147U      | LS3958 | 2N2982     | LS122 | 2N3800     | LS132   | 2N4092A    | LS4392  | 2N5045     | LS840  |
| 1278A      | LS842  | 2148U      | LS3958 | 2N3044     | LS122 | 2N3801     | LS132   | 2N4093     | LS4392  | 2N5046     | LS840  |
| 1279A      | LS842  | 2149U      | LS3958 | 2N3045     | LS122 | 2N3802     | LS132   | 2N4093A    | LS4392  | 2N5047     | LS840  |
| 1280A      | LS5912 | 231S       | LS3954 | 2N3046     | LS121 | 2N3803     | LS132   | 2N4100     | LS312   | 2N5090     | LS122  |
| 1281A      | LS842  | 232S       | LS3955 | 2N3047     | LS122 | 2N3804     | LS130   | 2N4116     | LS5911  | 2N5103     | LS5912 |
| 1282A      | LS842  | 233S       | LS3956 | 2N3048     | LS122 | 2N3804A    | LS130   | 2N4116A    | LS5912  | 2N5104     | LS5912 |
| 1283A      | LS842  | 234S       | LS3955 | 2N3049     | LS122 | 2N3805     | LS130   | 2N4117     | LS5905  | 2N5105     | LS5912 |
| 1284A      | LS845  | 235S       | LS3958 | 2N3050     | LS122 | 2N3805A    | LS130   | 2N4117A    | LS5905  | 2N5114     | LS4391 |
| 1285A      | LS842  | 241U       | LS842  | 2N3051     | LS122 | 2N3806     | LS352   | 2N4118     | LS5905  | 2N5115     | LS4392 |
| 1286A      | LS845  | 250U       | LS4391 | 2N3052     | LS122 | 2N3806     | LS351   | 2N4118A    | LS5905  | 2N5116     | LS4393 |
| 130U       | LS842  | 251U       | LS4392 | 2N3059     | LS122 | 2N3807     | LS352   | 2N4119     | LS5905  | 2N5117     | LS352  |
| 1325A      | LS845  | 2N2060     | LS120  | 2N3066     | LS842 | 2N3808     | LS352   | 2N4119A    | LS5905  | 2N5118     | LS352  |
| 135U       | LS842  | 2N2060A    | LS121  | 2N3067     | LS842 | 2N3809     | LS352   | 2N4120     | LS3N163 | 2N5119     | LS351  |
| 142T       | LS4392 | 2N2060B    | LS121  | 2N3068     | LS842 | 2N3810     | LS352   | 2N4139     | LS842   | 2N5120     | LS131  |
| 14T        | LS845  | 2N2223A    | LS121  | 2N3069     | LS842 | 2N3810A    | LS352   | 2N4220     | LS845   | 2N5121     | LS132  |
| 155U       | LS5912 | 2N2333     | LS122  | 2N3070     | LS842 | 2N3811     | LS352   | 2N4220A    | LS845   | 2N5122     | LS132  |
| 158T       | LS842  | 2N2453     | LS311  | 2N3071     | LS842 | 2N3811A    | LS352   | 2N4221     | LS845   | 2N5123     | LS131  |
| 159T       | LS5912 | 2N2453     | LS122  | 2N3072     | LS842 | 2N3812     | LS132   | 2N4221A    | LS845   | 2N5124     | LS132  |
| 1714A      | LS842  | 2N2453A    | LS121  | 2N3084     | LS842 | 2N3813     | LS132   | 2N4222     | LS845   | 2N5125     | LS132  |
| 182S       | LS4391 | 2N2453A    | LS311  | 2N3085     | LS842 | 2N3814     | LS132   | 2N4222A    | LS845   | 2N5158     | LSJ108 |
| 183S       | LS842  | 2N2480     | LS122  | 2N3086     | LS842 | 2N3815     | LS132   | 2N4223     | LS5912  | 2N5159     | LSJ110 |
| 197S       | LS842  | 2N2480A    | LS121  | 2N3087     | LS842 | 2N3816     | LS3N163 | 2N4224     | LS5912  | 2N5196     | LS840  |
| 198S       | LS842  | 2N2639     | LS120  | 2N3088     | LS842 | 2N3816A    | LS3N163 | 2N4267     | LS3N163 | 2N5197     | LS841  |
| 199S       | LS842  | 2N2639     | LS311  | 2N3088A    | LS842 | 2N3817     | LS130   | 2N4302     | LS4392  | 2N5198     | LS841  |
| 1N5283     | LS5905 | 2N2640     | LS311  | 2N3089     | LS842 | 2N3817A    | LS130   | 2N4303     | LS4392  | 2N5199     | LS842  |
| 1N5284     | LS5905 | 2N2640     | LS122  | 2N3089A    | LS842 | 2N3819     | LS845   | 2N4304     | LS4393  | 2N5245     | LS5912 |
| 1N5285     | LS5905 | 2N2641     | LS122  | 2N3333     | LS132 | 2N3820     | LS4393  | 2N4338     | LS842   | 2N5246     | LS5912 |
| 1N5286     | LS5905 | 2N2641     | LS311  | 2N3334     | LS132 | 2N3821     | LS842   | 2N4339     | LS842   | 2N5247     | LS5912 |
| 1N5287     | LS5905 | 2N2642     | LS311  | 2N3335     | LS132 | 2N3822     | LS842   | 2N4340     | LS842   | 2N5248     | LS5912 |
| 1N5288     | LS5905 | 2N2642     | LS122  | 2N3336     | LS132 | 2N3823     | LS842   | 2N4341     | LS842   | 2N5254     | LS132  |
| 1N5289     | LS5905 | 2N2643     | LS122  | 2N3347     | LS312 | 2N3824     | LS842   | 2N4352     | LS3N163 | 2N5255     | LS132  |
| 1N5290     | LS5905 | 2N2643     | LS311  | 2N3348     | LS312 | 2N3907     | LS120   | 2N4382     | LS4392  | 2N5256     | LS130  |
| 1N5291     | LS5905 | 2N2644     | LS311  | 2N3349     | LS132 | 2N3908     | LS120   | 2N4391     | LS4391  | 2N5257     | LS842  |
| 1N5292     | LS5905 | 2N2644     | LS122  | 2N3350     | LS312 | 2N3910     | LS312   | 2N4392     | LS4392  | 2N5258     | LS842  |
| 1N5293     | LS842  | 2N2652     | LS312  | 2N3351     | LS312 | 2N3921     | LS844   | 2N4393     | LS4393  | 2N5259     | LS842  |
| 1N5294     | LS842  | 2N2652     | LS120  | 2N3352     | LS132 | 2N3922     | LS844   | 2N4416     | LS5912  | 2N5358     | LS842  |
| 1N5295     | LS842  | 2N2652A    | LS120  | 2N3365     | LS842 | 2N3949     | LS132   | 2N4416A    | LS5912  | 2N5359     | LS842  |
| 1N5296     | LS842  | 2N2652A    | LS312  | 2N3366     | LS842 | 2N3950     | LS132   | 2N4445     | LSJ108  | 2N5360     | LS842  |
| 1N5297     | LS842  | 2N2720     | LS312  | 2N3367     | LS842 | 2N3954     | LS3954  | 2N4446     | LSJ108  | 2N5361     | LS842  |
| 1N5299     | LS842  | 2N2720     | LS312  | 2N3368     | LS842 | 2N3954A    | LS3954A | 2N4447     | LSJ108  | 2N5362     | LS842  |
| 1N5300     | LS842  | 2N2721     | LS312  | 2N3369     | LS842 | 2N3955     | LS845   | 2N4448     | LSJ108  | 2N5363     | LS845  |
| 1N5301     | LS842  | 2N2721     | LS312  | 2N3370     | LS842 | 2N3955A    | LS3954  | 2N4856     | LS4391  | 2N5364     | LS5912 |
| 1N5302     | LS842  | 2N2722     | LS311  | 2N3409     | LS122 | 2N3956     | LS3956  | 2N4856A    | LS4391  | 2N5391     | LS842  |
| 1N5303     | LS842  | 2N2802     | LS132  | 2N3410     | LS122 | 2N3957     | LS3955  | 2N4857     | LS4392  | 2N5392     | LS842  |
| 1N5304     | LS842  | 2N2803     | LS132  | 2N3411     | LS122 | 2N3958     | LS3958  | 2N4857A    | LS4392  | 2N5393     | LS842  |
| 1N5305     | LS842  | 2N2804     | LS132  | 2N3423     | LS122 | 2N3967     | LS845   | 2N4858     | LS4393  | 2N5394     | LS842  |
| 1N5306     | LS842  | 2N2805     | LS132  | 2N3424     | LS122 | 2N3967A    | LS845   | 2N4858A    | LS4393  | 2N5395     | LS842  |
| 1N5307     | LS842  | 2N2806     | LS132  | 2N3425     | LS318 | 2N3968     | LS845   | 2N4859     | LS4393  | 2N5396     | LS842  |
| 1N5308     | LS842  | 2N2807     | LS132  | 2N3436     | LS842 | 2N3968A    | LS845   | 2N4859A    | LS4393  | 2N5397     | LS5912 |
| 1N5309     | LS842  | 2N2903     | LS312  | 2N3437     | LS842 | 2N3969     | LS845   | 2N4860     | LS4391  | 2N5432     | LSJ108 |
| 1N5310     | LS842  | 2N2903A    | LS312  | 2N3438     | LS842 | 2N3970     | LS4391  | 2N4860A    | LS4391  | 2N5433     | LSJ108 |
| 1N5311     | LS842  | 2N2910     | LS122  | 2N3452     | LS842 | 2N3971     | LS4392  | 2N4861     | LS4392  | 2N5434     | LSJ110 |
| 1N5312     | LS842  | 2N2913     | LS311  | 2N3453     | LS842 | 2N3972     | LS4393  | 2N4861A    | LS4392  | 2N5452     | LS840  |
| 1N5313     | LS842  | 2N2914     | LS311  | 2N3454     | LS842 | 2N4009     | LS132   | 2N4867     | LS842   | 2N5453     | LS840  |
| 1N5314     | LS842  | 2N2915     | LS311  | 2N3456     | LS842 | 2N4010     | LS132   | 2N4867A    | LS842   | 2N5454     | LS840  |
| 2000M      | LS842  | 2N2915A    | LS120  | 2N3458     | LS842 | 2N4011     | LS132   | 2N4868     | LS842   | 2N5457     | LS842  |
| 2001M      | LS842  | 2N2916     | LS311  | 2N3459     | LS842 | 2N4015     | LS132   | 2N4868A    | LS842   | 2N5458     | LS842  |
| 200S       | LS4392 | 2N2916A    | LS120  | 2N3460     | LS842 | 2N4016     | LS312   | 2N4869     | LS842   | 2N5459     | LS842  |
| 200U       | LS842  | 2N2917     | LS311  | 2N3513     | LS122 | 2N4017     | LS132   | 2N4869A    | LS842   | 2N5460     | LS842  |
| 201S       | LS4391 | 2N2918     | LS311  | 2N3514     | LS122 | 2N4018     | LS132   | 2N4878     | LS312   | 2N5461     | LS842  |
| 202S       | LS4392 | 2N2919     | LS312  | 2N3515     | LS122 | 2N4019     | LS132   | 2N4879     | LS312   | 2N5462     | LS842  |
| 203S       | LS842  | 2N2919A    | LS120  | 2N3516     | LS122 | 2N4020     | LS132   | 2N4880     | LS312   | 2N5463     | LS842  |



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|------------|--------|------------|---------|------------|--------|------------|--------|------------|-----------|------------|-----------|
| 2N5464     | LS842  | 2N6451     | LS4393  | AD841      | LS841  | BFY82      | LS122  | CR200      | LS842     | E412       | LS842     |
| 2N5465     | LS842  | 2N6452     | LS4393  | AD842      | LS842  | BFY83      | LS122  | CR220      | LS842     | E413       | LS841     |
| 2N5484     | LS5912 | 2N6453     | LS4393  | AD845      | LS5911 | BFY84      | LS122  | CR240      | LS842     | E414       | LS841     |
| 2N5485     | LS5912 | 2N6454     | LS4393  | AD846      | LS5912 | BFY85      | LS122  | CR270      | LS842     | E415       | LS842     |
| 2N5486     | LS5912 | 2N6483     | LSU401  | AD847      | LS5912 | BFY86      | LS122  | CR300      | LS842     | E420       | LS5911    |
| 2N5515     | LS840  | 2N6484     | LSU402  | BC264      | LS845  | BFY91      | LS122  | CR330      | LS842     | E421       | LS5912    |
| 2N5516     | LS841  | 2N6485     | LSU404  | BC264A     | LS842  | BFY92      | LS122  | CR360      | LS842     | E430       | LS4391    |
| 2N5516     | LS841  | 2N6502     | LS122   | BC264B     | LS845  | BN209      | LS122  | CR390      | LS842     | E431       | LS4391    |
| 2N5517     | LS841  | 2N6503     | LS122   | BC264C     | LS845  | BSV22      | LS5912 | CR430      | LS842     | E500       | LS845     |
| 2N5518     | LS842  | 2N6905     | LS844   | BC264D     | LS5912 | BSV78      | LS4391 | CR470      | LS842     | E501       | LS845     |
| 2N5519     | LS842  | 2N6906     | LS844   | BCY87      | LS121  | BSV79      | LS4392 | CR530      | LS842     | E502       | LS845     |
| 2N5520     | LS840  | 2N6907     | LS845   | BCY88      | LS122  | BSV80      | LS4393 | CRO91      | LS842     | E503       | LS845     |
| 2N5521     | LS841  | 2SC294     | LS122   | BCY89      | LS122  | C2306      | LS840  | CRR0240    | LS845     | E504       | LS845     |
| 2N5522     | LS841  | 2SK170     | LS843   | BF244A     | LS5912 | C413N      | LSJ110 | CRR0360    | LS845     | E505       | LS845     |
| 2N5523     | LS842  | 3N145      | LS3N163 | BF244B     | LS5912 | C6690      | LS842  | CRR0560    | LS842     | E506       | LS842     |
| 2N5524     | LS842  | 3N146      | LS3N163 | BF244C     | LS5912 | C6691      | LS842  | CRR0800    | LS842     | E507       | LS842     |
| 2N5545     | LS840  | 3N155      | LS3N163 | BF245A     | LS5912 | C6692      | LS842  | CRR1250    | LS842     | E508       | LS842     |
| 2N5546     | LS841  | 3N155A     | LS3N163 | BF245B     | LS5912 | C673       | LS842  | CRR1950    | LS842     | E509       | LS842     |
| 2N5547     | LS841  | 3N156      | LS3N163 | BF245C     | LS5912 | C674       | LS842  | CRR2900    | LS842     | E510       | LS842     |
| 2N5549     | LS4392 | 3N156A     | LS3N163 | BF256LA    | LS5912 | C680       | LS842  | CRR4300    | LS842     | E511       | LS842     |
| 2N5561     | LSU401 | 3N157      | LS3N163 | BF256LB    | LS5912 | C681       | LS842  | D2T2218    | LS122     | EPAD100    | LSJPAD100 |
| 2N5561     | LS844  | 3N157A     | LS3N163 | BF256LC    | LS5912 | C681A      | LS842  | D2T2219    | LS122     | EPAD200    | LSJPAD200 |
| 2N5562     | LSU402 | 3N158      | LS3N163 | BF410A     | LS842  | C682       | LS842  | D2T2904    | LS132     | EPAD50     | LSJPAD50  |
| 2N5563     | LSU404 | 3N158A     | LS3N163 | BF410B     | LS842  | C683       | LS842  | D2T2905    | LS132     | EPAD500    | LSJPAD500 |
| 2N5564     | LS5911 | 3N163      | LS3N163 | BF410C     | LS842  | C683A      | LS842  | D2T918     | LS122     | ESM25      | LS841     |
| 2N5565     | LS5911 | 3N164      | LS3N164 | BF410D     | LS842  | C684       | LS845  | DA102      | LS840     | ESM25A     | LS841     |
| 2N5566     | LS5912 | 3N165      | LS3N165 | BFQ10      | LS844  | C684A      | LS845  | DA402      | LS840     | ESM4091    | LS4391    |
| 2N5592     | LS842  | 3N166      | LS3N166 | BFQ11      | LSU401 | C685       | LS845  | DN5564     | LS4391    | ESM4092    | LS4392    |
| 2N5593     | LS842  | 3N170      | LS3N170 | BFQ12      | LS844  | C685A      | LS845  | DN5565     | LS4391    | ESM4093    | LS4393    |
| 2N5594     | LS842  | 3N171      | LS3N171 | BFQ13      | LS844  | CM600      | LS4392 | DN5566     | LS4391    | ESM4302    | LS842     |
| 2N5638     | LS4391 | 3N174      | LS3N163 | BFQ14      | LS845  | CM601      | LS4391 | DN5567     | LS4391    | ESM4303    | LS845     |
| 2N5639     | LS4392 | 703U       | LS845   | BFQ15      | LS845  | CM602      | LS4391 | DPAD1      | LSDPAD1   | ESM4304    | LS845     |
| 2N5640     | LS4393 | 704U       | LS845   | BFQ16      | LS845  | CM603      | LS4391 | DPAD10     | LSDPAD10  | FE0654A    | LS5912    |
| 2N5647     | LS5905 | 705U       | LS5912  | BFQ23      | LS5912 | CM640      | LS4393 | DPAD100    | LSDPAD100 | FE0654B    | LS5912    |
| 2N5648     | LS5905 | 707U       | LS4391  | BFQ26      | LS844  | CM641      | LS4393 | DPAD2      | LSDPAD2   | FE100      | LS842     |
| 2N5649     | LS5905 | 714U       | LS842   | BFQ44      | LS5912 | CM642      | LS4393 | DPAD20     | LSDPAD20  | FE100A     | LS842     |
| 2N5793     | LS122  | 734EU      | LS5912  | BFQ45      | LS5912 | CM643      | LS4392 | DPAD5      | LSDPAD5   | FE102      | LS5905    |
| 2N5794     | LS122  | 734U       | LS5912  | BFQ49      | LS3958 | CM644      | LS4392 | DPAD50     | LSDPAD50  | FE102A     | LS5905    |
| 2N5795     | LS132  | 751U       | LS842   | BFR30      | LS842  | CM645      | LS4392 | DU4339     | LS842     | FE104      | LS5905    |
| 2N5796     | LS132  | 752U       | LS842   | BFR31      | LS842  | CM646      | LS4392 | DU4340     | LS842     | FE104A     | LS5905    |
| 2N5801     | LS4393 | 753U       | LS842   | BFR45      | LS5912 | CM647      | LS4391 | E100       | LS842     | FE200      | LS842     |
| 2N5802     | LS4393 | 754U       | LS842   | BFS21      | LS842  | CM650      | LSJ108 | E101       | LS842     | FE202      | LS842     |
| 2N5803     | LS4392 | 755U       | LS842   | BFS21A     | LS842  | CM651      | LSJ108 | E102       | LS842     | FE204      | LS842     |
| 2N5843     | LS130  | 756U       | LS842   | BFS67      | LS842  | CM652      | LSJ108 | E108       | LSJ108    | FE300      | LS842     |
| 2N5844     | LS130  | A050       | LS844   | BFS68      | LS842  | CM653      | LSJ108 | E109       | LSJ109    | FE302      | LS842     |
| 2N5902     | LS830  | A192       | LS5912  | BFS68P     | LS5912 | CM697      | LSJ110 | E110       | LSJ110    | FE304      | LS842     |
| 2N5903     | LS830  | A5T3821    | LS5912  | BFS70      | LS842  | CM800      | LSJ110 | E111       | LS4391    | FE3819     | LS845     |
| 2N5904     | LS830  | A5T3822    | LS5912  | BFS71      | LS842  | CP643      | LSJ110 | E112       | LS4392    | FE5457     | LS842     |
| 2N5905     | LS5905 | A5T3823    | LS5912  | BFS72      | LS842  | CP650      | LSJ108 | E113       | LS4393    | FE5458     | LS842     |
| 2N5906     | LS5906 | AD3954     | LS3954  | BFS73      | LS842  | CP651      | LSJ108 | E174       | LS4391    | FE5459     | LS842     |
| 2N5907     | LS5907 | AD3954A    | LS3954A | BFS74      | LS4391 | CP652      | LSJ108 | E175       | LS4392    | FE5484     | LS5912    |
| 2N5908     | LS5908 | AD3954A    | LS3954A | BFS75      | LS4392 | CP653      | LSJ108 | E176       | LS4393    | FE5485QN   | LS5912    |
| 2N5909     | LS5909 | AD3955     | LS3955  | BFS76      | LS4393 | CR022      | LS5905 | E177       | LS4393    | FE5486     | LS5912    |
| 2N5911     | LS5911 | AD3956     | LS3956  | BFS77      | LS4393 | CR024      | LS5905 | E201       | LS842     | FM1100     | LS3954    |
| 2N5912     | LS5912 | AD3957     | LS3955  | BFS78      | LS4391 | CR027      | LS5905 | E202       | LS842     | FM1100A    | LS5906    |
| 2N5949     | LS5912 | AD3958     | LS3958  | BFS79      | LS4392 | CR030      | LS5905 | E203       | LS842     | FM1101A    | LS5906    |
| 2N5950     | LS5912 | AD810      | LS310   | BFS80      | LS5912 | CR033      | LS5905 | E204       | LS842     | FM1102     | LS3954    |
| 2N5951     | LS5912 | AD811      | LS311   | BFT46      | LS842  | CR039      | LS5905 | E210       | LS5912    | FM1102A    | LS5906    |
| 2N5952     | LS5912 | AD812      | LS312   | BFW10      | LS842  | CR043      | LS5905 | E211       | LS5912    | FM1103     | LS3955    |
| 2N5953     | LS5912 | AD813      | LS313   | BFW11      | LS842  | CR047      | LS5905 | E212       | LS5912    | FM1103A    | LS5908    |
| 2N6085     | LS122  | AD814      | LS302   | BFW12      | LS845  | CR056      | LS5905 | E230       | LS842     | FM1104     | LS3957    |
| 2N6086     | LS122  | AD815      | LS301   | BFW13      | LS842  | CR062      | LS5905 | E231       | LS842     | FM1104A    | LS5909    |
| 2N6087     | LS121  | AD816      | LS303   | BFW39      | LS122  | CR068      | LS842  | E232       | LS842     | FM1105     | LS3954    |
| 2N6088     | LS121  | AD820      | LS350   | BFW39A     | LS120  | CR075      | LS842  | E270       | LS4393    | FM1105A    | LS832     |
| 2N6089     | LS122  | AD821      | LS351   | BFW55      | LS842  | CR075      | LS842  | E271       | LS4392    | FM1106     | LS3954    |
| 2N6090     | LS121  | AD822      | LS352   | BFW56      | LS842  | CR082      | LS842  | E300       | LS5912    | FM1106A    | LS832     |
| 2N6091     | LS121  | AD830      | LS830   | BFW61      | LS5912 | CR082      | LS842  | E304       | LS5912    | FM1107     | LS3954    |
| 2N6092     | LS121  | AD831      | LS831   | BFX11      | LS132  | CR091      | LS842  | E305       | LS5912    | FM1107A    | LS832     |
| 2N6441     | LS122  | AD832      | LS832   | BFX15      | LS131  | CR100      | LS842  | E308       | LS4391    | FM1108     | LS3955    |
| 2N6442     | LS122  | AD833      | LS833   | BFX36      | LS122  | CR110      | LS842  | E309       | LS4391    | FM1108A    | LS832     |
| 2N6443     | LS122  | AD835      | LS842   | BFX70      | LS122  | CR120      | LS842  | E310       | LS4391    | FM1109     | LS3957    |
| 2N6444     | LS122  | AD836      | LS842   | BFX71      | LS122  | CR130      | LS842  | E400       | LS841     | FM1109A    | LS832     |
| 2N6445     | LS121  | AD837      | LS842   | BFX72      | LS122  | CR140      | LS842  | E401       | LS841     | FM1110     | LS3955    |
| 2N6446     | LS121  | AD838      | LS845   | BFX99      | LS120  | CR160      | LS842  | E402       | LS841     | FM1110A    | LS5908    |
| 2N6447     | LS121  | AD839      | LS845   | BFY20      | LS122  | CR160      | LS842  | E410       | LS841     | FM1111     | LS3957    |
| 2N6448     | LS121  | AD840      | LS840   | BFY81      | LS122  | CR180      | LS842  | E411       | LS841     | FM1111A    | LS5909    |

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| FM1112     | LS840   | IT502      | LS844  | ITE3804    | LS130   | J230       | LS842     | KE4391     | LS4391  | LS3550C    | LS3550C |
| FM1200     | LS3954  | IT503      | LS845  | ITE3806    | LS132   | J231       | LS842     | KE4392     | LS4392  | LS358      | LS358   |
| FM1201     | LS3954  | IT504      | LS845  | ITE3807    | LS132   | J232       | LS842     | KE4393     | LS4393  | LS3954A    | LS3954A |
| FM1202     | LS3954  | IT505      | LS845  | ITE3808    | LS132   | J270       | LS4393P   | KE4416     | LS5912  | LS3954     | LS3954  |
| FM1203     | LS3955  | IT550      | LS5912 | ITE3809    | LS132   | J271       | LS4392    | KE4856     | LS4391  | LS3955     | LS3955  |
| FM1204     | LS3955  | IT5911     | LS5911 | ITE3810    | LS130   | J300A      | LS5912    | KE4857     | LS4392  | LS3956     | LS3956  |
| FM1205     | LS3954  | IT5912     | LS5912 | ITE3811    | LS130   | J300B      | LS5912    | KE4858     | LS4393  | LS3958     | LS3958  |
| FM1206     | LS3954  | ITC2975    | LS120  | ITE3907    | LS120   | J300C      | LS5912    | KE4859     | LS4391  | LS4117     | LS4117  |
| FM1207     | LS3954  | ITC2976    | LS120  | ITE3908    | LS120   | J300D      | LS5912    | KE4860     | LS4392  | LS4118     | LS4118  |
| FM1208     | LS3955  | ITC2977    | LS120  | ITE4017    | LS132   | J304       | LS5912    | KE4861     | LS4393  | LS4119     | LS4119  |
| FM1209     | LS3955  | ITC2978    | LS120  | ITE4018    | LS132   | J305       | LS5912    | KE5103     | LS5912  | LS4391     | LS4391  |
| FM1210     | LS3955  | ITC2979    | LS120  | ITE4019    | LS132   | J308       | LS4391    | KE5104     | LS5912  | LS4392     | LS4392  |
| FM1211     | LS5911  | ITC3347    | LS312  | ITE4020    | LS132   | J309       | LS4391    | KH5196     | LS840   | LS4393     | LS4393  |
| FM3954     | LS3954  | ITC3348    | LS312  | ITE4021    | LS132   | J310       | LS4391    | KH5197     | LS841   | LS5905     | LS5905  |
| FM3954A    | LS3954  | ITC3349    | LS132  | ITE4022    | LS132   | J401       | LSU401    | KH5198     | LS5911  | LS5906     | LS5906  |
| FM3955     | LS3955  | ITC3350    | LS312  | ITE4023    | LS312   | J402       | LSU402    | KH5199     | LS845   | LS5907     | LS5907  |
| FM3955A    | LS3954  | ITC3351    | LS312  | ITE4024    | LS312   | J403       | LSU403    | KK4416     | LS5912  | LS5908     | LS5908  |
| FM3956     | LS3956  | ITC3352    | LS132  | ITE4025    | LS312   | J404       | LS845     | LDF603     | LS845   | LS5909     | LS5909  |
| FM3957     | LS3955  | ITC3800    | LS132  | ITE4117    | LS5905  | J405       | LS845     | LDF604     | LS845   | LS5911     | LS5911  |
| FM3958     | LS3958  | ITC3802    | LS132  | ITE4118    | LS5905  | J406       | LS845     | LDF605     | LS845   | LS5912     | LS5912  |
| FN4117     | LS5905  | ITC3804    | LS130  | ITE4119    | LS5905  | J410       | LS841     | LM114      | LS120   | LS5912C    | LS5912C |
| FN4117A    | LS5905  | ITC3806    | LS132  | ITE4338    | LS842   | J411       | LS842     | LM114A     | LS312   | LS823      | LS823   |
| FN4118     | LS5905  | ITC3807    | LS132  | ITE4339    | LS842   | J412       | LS842     | LM115      | LS120   | LS824      | LS824   |
| FN4118A    | LS5905  | ITC3808    | LS132  | ITE4340    | LS842   | J420       | LS5911    | LM194      | LS120   | LS830      | LS830   |
| FN4119     | LS5905  | ITC3809    | LS132  | ITE4341    | LS842   | J421       | LS5912    | LM394      | LS120   | LS831      | LS831   |
| FN4119A    | LS5905  | ITC3810    | LS130  | ITE4391    | LS4391  | J500       | LS845     | LSIT120    | LS120   | LS832      | LS832   |
| FN4119A    | LS5905  | ITC3811    | LS130  | ITE4392    | LS4392  | J501       | LS845     | LSIT120A   | LS120A  | LS833      | LS833   |
| FN4392     | LS4392  | ITC4017    | LS132  | ITE4393    | LS4393  | J502       | LS845     | LSIT121    | LS121   | LS840      | LS840   |
| FN4393     | LS4393  | ITC4018    | LS132  | ITE4416    | LS5912  | J503       | LS845     | LSIT122    | LS122   | LS841      | LS841   |
| FTO654A    | LS5912  | ITC4019    | LS132  | ITE4867    | LS842   | J504       | LS845     | LSIT130    | LS130   | LS842      | LS842   |
| FTO654B    | LS5912  | ITC4020    | LS132  | ITE4868    | LS842   | J505       | LS845     | LSIT130A   | LS130A  | LS843      | LS843   |
| FTO654C    | LS845   | ITC4021    | LS132  | ITE4869    | LS842   | J506       | LS842     | LSIT131    | LS131   | LS844      | LS844   |
| FTO654D    | LS845   | ITC4022    | LS132  | ITE500     | LS845   | J507       | LS842     | LSIT132    | LS132   | LS845      | LS845   |
| FTO704     | LS3N163 | ITC4023    | LS312  | ITE501     | LS845   | J508       | LS842     | LSJ210     | LSJ210  | LS846      | LS846   |
| GET5457    | LS842   | ITC4024    | LS312  | ITE502     | LS845   | J509       | LS842     | LSJ211     | LSJ211  | M163       | LS3N163 |
| GET5458    | LS842   | ITC4025    | LS312  | ITE503     | LS845   | J510       | LS842     | LSJ212     | LSJ212  | M164       | LS3N164 |
| GET5459    | LS842   | ITC4053    | LS120  | ITE504     | LS845   | J511       | LS842     | LSJ108     | LSJ108  | M440       | LS5911  |
| HA7807     | LS132   | ITE2639    | LS120  | ITE505     | LS845   | J552       | LS842     | LSJ109     | LSJ109  | M441       | LS5911  |
| HA7809     | LS132   | ITE2640    | LS122  | ITE506     | LS842   | J553       | LS842     | LSJ110     | LSJ110  | M5911      | LS5911  |
| HDIG1030   | LS3N163 | ITE2641    | LS122  | ITE507     | LS842   | J554       | LS842     | LSJ110     | LSJ110  | M5912      | LS5912  |
| ID100      | LSID100 | ITE2642    | LS120  | J108       | LSJ108  | J555       | LS842     | LS3N163    | LS3N163 | MAT01      | LS312   |
| ID101      | LSID101 | ITE2643    | LS122  | J109       | LSJ109  | J556       | LS842     | LS3N164    | LS3N164 | MAT02      | LS318   |
| IMF3954    | LS3954  | ITE2644    | LS122  | J110       | LSJ110  | J557       | LS842     | LS3N165    | LS3N165 | MAT03      | LS358   |
| IMF3954A   | LS3954A | ITE2720    | LS120  | J110A      | LSJ110A | J9100      | LS842     | LS3N166    | LS3N166 | MD1120     | LS122   |
| IMF3955    | LS3955  | ITE2721    | LS122  | J111       | LS4391  | JPAD10     | LSJPAD10  | LS3N170    | LS3N170 | MD1121     | LS122   |
| IMF3955A   | LS3954  | ITE2722    | LS120  | J111A      | LS4391  | JPAD100    | LSJPAD100 | LS3N171    | LS3N171 | MD1122     | LS122   |
| IMF3956    | LS3956  | ITE2903    | LS122  | J112       | LS4392  | JPAD200    | LSJPAD200 | LSU401     | LSU401  | MD1123     | LS132   |
| IMF3957    | LS3955  | ITE2913    | LS122  | J112A      | LS4392  | JPAD5      | LSJPAD5   | LSU402     | LSU402  | MD1129     | LS122   |
| IMF3958    | LS3958  | ITE2914    | LS122  | J113       | LS4393  | JPAD50     | LSJPAD50  | LSU403     | LSU403  | MD1130     | LS132   |
| IMF6485    | LSU405  | ITE2915    | LS120  | J113A      | LS4393  | JPAD500    | LSJPAD500 | LSU404     | LSU404  | MD2218     | LS122   |
| IT100      | LS4393P | ITE2916    | LS120  | J1401      | LS830   | K210-18    | LS5912    | LSU405     | LSU405  | MD2219     | LS122   |
| IT101      | LS4391P | ITE2917    | LS122  | J1401      | LS844   | K211-18    | LS5912    | LSU406     | LSU406  | MD2369     | LS122   |
| IT108      | LS5912  | ITE2918    | LS122  | J1402      | LS844   | K212-18    | LS5912    | LS421      | LS421   | MD2904     | LS132   |
| IT109      | LS4391  | ITE2919    | LS120  | J1402      | LS832   | K300-18    | LS5912    | LS422      | LS422   | MD2905     | LS132   |
| IT120      | LS120   | ITE2920    | LS120  | J1403      | LS832   | K304-18    | LS5912    | LS423      | LS423   | MD2974     | LS120   |
| IT120A     | LS120A  | ITE2936    | LS120  | J1403      | LS844   | K305-18    | LS5912    | LS424      | LS424   | MD2975     | LS120   |
| IT121      | LS121   | ITE2937    | LS120  | J1404      | LS845   | K308-18    | LS4391    | LS425      | LS425   | MD2978     | LS120   |
| IT122      | LS122   | ITE2972    | LS122  | J1404      | LS832   | K309-18    | LS4391    | LS426      | LS426   | MD2979     | LS120   |
| IT124      | LS124   | ITE2973    | LS122  | J1404      | LSU404  | K310-18    | LS4391    | LS301      | LS301   | MD3008     | LS120   |
| IT126      | LS312   | ITE2974    | LS120  | J1405      | LSU405  | KA3524     | LS124     | LS302      | LS302   | MD3250     | LS132   |
| IT127      | LS312   | ITE2975    | LS120  | J1405      | LS832   | KE3684     | LS842     | LS303      | LS303   | MD3251     | LS132   |
| IT128      | LS312   | ITE2976    | LS120  | J1406      | LS845   | KE3685     | LS842     | LS310      | LS310   | MD3409     | LS122   |
| IT129      | LS311   | ITE2977    | LS120  | J1406      | LSU406  | KE3686     | LS842     | LS311      | LS311   | MD3410     | LS122   |
| IT130      | LS130   | ITE2978    | LS120  | J1406      | LS845   | KE3687     | LS842     | LS312      | LS312   | MD3467     | LS132   |
| IT130A     | LS130A  | ITE2979    | LS120  | J1406      | LS832   | KE3823     | LS5912    | LS313      | LS313   | MD3725     | LS122   |
| IT131      | LS131   | ITE3066    | LS842  | J174       | LS4391P | KE3970     | LS4391    | LS318      | LS318   | MD3762     | LS132   |
| IT132      | LS132   | ITE3067    | LS842  | J175       | LS4392P | KE3971     | LS4391    | LS3250     | LS3250  | MD4957     | LS132   |
| IT136      | LS352   | ITE3068    | LS842  | J176       | LS4393P | KE3972     | LS4391    | LS3250A    | LS3250  | MD5000     | LS132   |
| IT137      | LS352   | ITE3347    | LS312  | J177       | LS4393P | KE4091     | LS4391    | LS3250B    | LS3250  | MD7000     | LS122   |
| IT138      | LS351   | ITE3348    | LS312  | J201       | LS842   | KE4092     | LS4391    | LS3250C    | LS3250  | MD7001     | LS132   |
| IT139      | LS351   | ITE3349    | LS132  | J202       | LS842   | KE4093     | LS4391    | LS350      | LS350   | MD7002     | LS122   |
| IT140      | LS313   | ITE3350    | LS312  | J203       | LS842   | KE4220     | LS842     | LS351      | LS351   | MD7003     | LS132   |
| IT1700     | LS3N163 | ITE3351    | LS312  | J204       | LS842   | KE4221     | LS842     | LS352      | LS352   | MD7004     | LS122   |
| IT1702     | LS3N163 | ITE3680    | LS120  | J210       | LSJ210  | KE4222     | LS842     | LS3550     | LS3550  | MD7007     | LS122   |
| IT500      | LS844   | ITE3800    | LS132  | J211       | LSJ211  | KE4223     | LS5912    | LS3550A    | LS3550A | MD708      | LS122   |
| IT501      | LS844   | ITE3802    | LS132  | J212       | LSJ212  | KE4224     | LS5912    | LS3550B    | LS3550B | MD8001     | LS120   |

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|------------|---------|------------|--------|------------|----------|-------------|------------|------------|--------|------------|--------|
| MD8002     | LS120   | MP5912     | LS5912 | NPD5566    | LS844    | SL362       | LS122      | SST4857    | LS4857 | TD202      | LS122  |
| MD8003     | LS122   | MP5912C    | LS5912 | NPD8301    | LS3954   | SSM2220     | LS358      | SST4858    | LS4858 | TD2219     | LS122  |
| MD918      | LS122   | MP830      | LS830  | NPD8302    | LS3955   | SD210       | SD210      | SST4859    | LS4859 | TD224      | LS122  |
| MD982      | LS132   | MP831      | LS831  | NPD8303    | LS3956   | SD210DE     | SD210DE    | SST4860    | LS4860 | TD225      | LS122  |
| MD984      | LS132   | MP832      | LS832  | P1086      | LS4393   | SD211DE     | SD211DE    | SST4861    | LS4861 | TD226      | LS122  |
| MEF3954    | LS3954  | MP833      | LS833  | P1087      | LS4393   | SD211       | SD211      | SST5114    | LS5114 | TD227      | LS122  |
| MEF3955    | LS3955  | MP840      | LS840  | PAD1       | LSPAD1   | SD213       | SD213      | SST5115    | LS5115 | TD228      | LS122  |
| MEF3956    | LS3956  | MP841      | LS841  | PAD10      | LSPAD10  | SD213DE     | SD211DE    | SST5116    | LS5116 | TD229      | LS122  |
| MEF3957    | LS841   | MP842      | LS842  | PAD100     | LSPAD100 | SD214DE     | SD214DE    | SST5460    | LS5460 | TD230      | LS122  |
| MEF3958    | LS3958  | MP843      | LS843  | PAD2       | LSPAD2   | SD214       | SD214      | SST5461    | LS5461 | TD231      | LS122  |
| MEF5561    | LS844   | MP844      | LS844  | PAD20      | LSPAD20  | SD215DE     | SD215DE    | SST5462    | LS5462 | TD232      | LS122  |
| MEF5562    | LS844   | MP845      | LS845  | PAD5       | LSPAD5   | SD215       | SD215      | SST5463    | LS5463 | TD233      | LS122  |
| MEF5563    | LS844   | MPF102     | LS5912 | PAD50      | LSPAD50  | SD217       | LS823      | SST5464    | LS5464 | TD234      | LS122  |
| MEM520     | LS3N164 | MPF103     | LS842  | PF510      | LS4391   | SD219       | LS824      | SST5465    | LS5465 | TD235      | LS122  |
| MEM520C    | LS3N164 | MPF104     | LS842  | PN4091     | LS4391   | SD5000      | SD5000     | SST5484    | LS5484 | TD236      | LS122  |
| MEM561     | LS3N163 | MPF105     | LS842  | PN4092     | LS4392   | SD5000N     | SD5000N    | SST5485    | LS5485 | TD237      | LS122  |
| MEM561C    | LS3N163 | MPF106     | LS5912 | PN4093     | LS4393   | SD5001      | SD5001     | SST5486    | LS5486 | TD238      | LS122  |
| MEM806     | LS3N163 | MPF107     | LS5912 | PN4117     | LS5905   | SD5001N     | SD5001N    | SST5638    | LS5638 | TD239      | LS122  |
| MEM806A    | LS3N163 | MPF108     | LS5912 | PN4117A    | LS5905   | SD5000I     | SD5000I    | SST5639    | LS5639 | TD240      | LS121  |
| MFE2000    | LS5912  | MPF109     | LS5912 | PN4118     | LS5905   | SD5400      | SD5400     | SST5640    | LS5640 | TD241      | LS121  |
| MFE2001    | LS5912  | MPF111     | LS5912 | PN4118A    | LS5905   | SD5400CY    | SD5400CY   | SST5911    | LS5911 | TD242      | LS120  |
| MFE2004    | LS4392  | MPF112     | LS5912 | PN4119     | LS5905   | SD5401      | SD5401     | SST5912    | LS5912 | TD243      | LS120  |
| MFE2005    | LS4392  | MPF256     | LS4391 | PN4119A    | LS5905   | SD5401CY    | SD5401CY   | SST823     | SST823 | TD244      | LS122  |
| FE2006     | LS4391  | MPF4391    | LS4391 | PN4120     | LS5905   | SSTPAD5     | LSPAD5     | SST824     | SST824 | TD245      | LS122  |
| MFE2007    | LS4391  | MPF4392    | LS4392 | PN4120A    | LS5905   | SSTPAD10    | LSPAD10    | SU2020     | LS3954 | TD246      | LS122  |
| MFE2008    | LS4393  | MPF4393    | LS4393 | PN4302     | LS842    | SSTPAD20    | LSPAD20    | SU2021     | LS3954 | TD247      | LS122  |
| MFE2009    | LS4393  | MPF820     | LS4391 | PN4303     | LS845    | SSTPAD50    | LSPAD50    | SU2022     | LS3954 | TD248      | LS122  |
| MFE2010    | LSJ110  | MPF970     | LS4391 | PN4304     | LS845    | SSTPAD100   | LSPAD100   | SU2023     | LS3954 | TD250      | LS120  |
| MFE2011    | LSJ108  | MPF971     | LS4393 | PN4391     | LS4391   | SSTD PAD5   | LSD PAD5   | SU2024     | LS3954 | TD2905     | LS122  |
| MFE2012    | LSJ108  | ND5700     | LS120  | PN4392     | LS4392   | SSTD PAD10  | LSD PAD10  | SU2025     | LS3954 | TD400      | LS132  |
| MFE2093    | LS842   | ND5701     | LS120  | PN4393     | LS4393   | SSTD PAD20  | LSD PAD20  | SU2026     | LS3954 | TD401      | LS132  |
| MFE2094    | LS842   | ND5702     | LS120  | PN4416     | LS5912   | SSTD PAD50  | LSD PAD50  | SU2027     | LS3954 | TD402      | LS132  |
| MFE823     | LS3N163 | NDF9401    | LS832  | PN5163     | LS5912   | SSTD PAD100 | LSD PAD100 | SU2028     | LS3954 | TD500      | LS132  |
| MK10       | LS5912  | NDF9402    | LS832  | S04416     | LS5912   | SST108      | LSJ108     | SU2029     | LS3954 | TD501      | LS132  |
| MMBF310    | LS4391  | NDF9403    | LS832  | SA2253     | LS122    | SST109      | LSJ108     | SU2030     | LS3954 | TD502      | LS132  |
| MMBF4391   | LS4391  | NDF9404    | LS832  | SA2254     | LS122    | SST110      | LSJ110     | SU2031     | LS3954 | TD509      | LS132  |
| MMBF4392   | LS4392  | NDF9405    | LS832  | SA2255     | LS122    | SST111      | LS111      | SU2032     | LS3954 | TD510      | LS132  |
| MMBF4393   | LS4393  | NDF9406    | LS832  | SA2644     | LS120    | SST112      | LS112      | SU2033     | LS3954 | TD511      | LS132  |
| MMBF4416   | LS5912  | NDF9407    | LS832  | SA2648     | LS120    | SST113      | LS113      | SU2034     | LS3955 | TD512      | LS132  |
| MMBF4860   | LS4391  | NDF9408    | LS832  | SA2710     | LS120    | SST174      | LS174      | SU2035     | LS3954 | TD513      | LS132  |
| MMBF5310   | LS4391  | NDF9409    | LS832  | SA2711     | LS120    | SST175      | LS175      | SU2074     | LS3954 | TD514      | LS132  |
| MMBF5457   | LS842   | NDF9410    | LS832  | SA2712     | LS121    | SST176      | LS176      | SU2075     | LS3954 | TD517      | LS132  |
| MMBF5484   | LS842   | NF4445     | LSJ108 | SA2713     | LS121    | SST177      | LS177      | SU2076     | LS3954 | TD518      | LS132  |
| MMF1       | LS844   | NF4446     | LSJ108 | SA2714     | LS122    | SST201      | LS201      | SU2077     | LS3954 | TD519      | LS132  |
| MMF2       | LS844   | NF4447     | LSJ108 | SA2715     | LS120    | SST202      | LS202      | SU2078     | LS425  | TD520      | LS132  |
| MMF3       | LS844   | NF4448     | LSJ108 | SA2716     | LS120    | SST203      | LS203      | SU2079     | LS425  | TD521      | LS132  |
| MMF4       | LS844   | NF500      | LS5912 | SA2717     | LS121    | SST204      | LS204      | SU2080     | LS845  | TD522      | LS132  |
| MMF5       | LS844   | NF501      | LS5912 | SA2718     | LS122    | SST210      | SST210     | SU2081     | LS845  | TD523      | LS132  |
| MMF6       | LS844   | NF506      | LS5912 | SA2719     | LS120    | SST211      | SST211     | SU2098     | LS841  | TD524      | LS132  |
| MMT3823    | LS842   | NF510      | LS4393 | SA2720     | LS121    | SST213      | SST213     | SU2098A    | LS840  | TD525      | LS132  |
| MP301      | LS301   | NF511      | LS4393 | SA2721     | LS122    | SST214      | SST214     | SU2098B    | LS841  | TD526      | LS132  |
| MP302      | LS302   | NF520      | LS842  | SA2722     | LS120    | SST215      | SST215     | SU2099     | LS841  | TD527      | LS131  |
| MP303      | LS303   | NF521      | LS842  | SA2723     | LS121    | SST270      | SST270     | SU2099A    | LS841  | TD528      | LS131  |
| MP310      | LS310   | NF522      | LS842  | SA2724     | LS122    | SST271      | SST271     | SU2365     | LSU401 | TD5902     | LS5906 |
| MP311      | LS311   | NF523      | LS842  | SA2726     | LS122    | SST308      | LSJ308     | SU2365A    | LSU401 | TD5903     | LS841  |
| MP312      | LS312   | NF530      | LS842  | SA2727     | LS122    | SST309      | LSJ309     | SU2366     | LSU402 | TD5904     | LS5908 |
| MP313      | LS313   | NF531      | LS842  | SA2738     | LS120    | SST310      | LSJ310     | SU2366A    | LSU402 | TD5905     | LS5905 |
| MP318      | LS318   | NF532      | LS842  | SA2739     | LS120    | SST404      | LSU404     | SU2367     | LSU403 | TD5906     | LS5906 |
| MP350      | LS350   | NF533      | LS842  | SDF500     | LS840    | SST405      | LSU405     | SU2367A    | LSU403 | TD5907     | LS841  |
| MP351      | LS351   | NF5457     | LS842  | SDF501     | LS840    | SST406      | LSU406     | SU2368     | LSU404 | TD5908     | LS5908 |
| MP352      | LS352   | NF5458     | LS842  | SDF502     | LS840    | SST410      | LS410      | SU2368A    | LSU404 | TD5909     | LS5909 |
| MP358      | LS358   | NF5459     | LS842  | SDF503     | LS840    | SST411      | LS411      | SU2369     | LSU405 | TD5911     | LS5911 |
| MP360      | LS350   | NF5484     | LS5912 | SDF504     | LS840    | SST412      | LS412      | SU2369A    | LSU405 | TD5911A    | LS5911 |
| MP361      | LS351   | NF5485     | LS5912 | SDF505     | LS840    | SST4117     | LS4117     | SU2410     | LS424  | TD5912     | LS5912 |
| MP362      | LS352   | NF5486     | LS5912 | SDF506     | LS840    | SST4118     | LS4118     | SU2411     | LS425  | TD5912A    | LS5912 |
| MP3954     | LS3954  | NF5638     | LS4391 | SDF507     | LS840    | SST4119     | LS4119     | SU2412     | LS426  | TD700      | LS122  |
| MP3954A    | LS3954A | NF5639     | LS4392 | SDF509     | LS840    | SST4091     | LS4091     | SU2652     | LS844  | TD701      | LS122  |
| MP3955     | LS3955  | NF5640     | LS4393 | SDF510     | LS3954   | SST4092     | LS4092     | SU2653     | LS844  | TD709      | LS122  |
| MP3956     | LS3956  | NF580      | LSJ108 | SDF512     | LS3954   | SST4093     | LS4093     | SU2654     | LS844  | TD710      | LS122  |
| MP3958     | LS3958  | NF581      | LSJ108 | SDF513     | LS3954   | SST4391     | LS4391     | SU2655     | LS844  | TD711      | LS122  |
| MP5905     | LS5905  | NF582      | LSJ108 | SDF514     | LS3954   | SST4392     | LS4392     | SU2656     | LS845  | TD713      | LS122  |
| MP5906     | LS5906  | NF583      | LSJ110 | SDF661     | LS122    | SST4393     | LS4393     | TD100      | LS122  | TIS14      | LS842  |
| MP5907     | LS5907  | NF584      | LSJ108 | SDF662     | LS122    | SST440      | LS5911     | TD101      | LS122  | TIS25      | LS842  |
| MP5908     | LS5908  | NF585      | LS4393 | SDF663     | LS122    | SST441      | LS5911     | TD102      | LS122  | TIS26      | LS842  |
| MP5909     | LS5909  | NPD5564    | LS844  | SL301      | LS122    | SST4416     | LS4416     | TD200      | LS122  | TIS27      | LS842  |
| MP5911     | LS5911  | NPD5565    | LS844  | SL360      | LS122    | SST4856     | LS4856     | TD201      | LS122  | TIS41      | LS4393 |

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| TIS58      | LS5912 | U250       | LS5908  | UC2134     | LS3956   |
| TIS68      | LS3955 | U250A      | LS5908  | UC2136     | LS3955   |
| TIS69      | LS3955 | U251       | LS5905  | UC2138     | LS3958   |
| TIS70      | LS3956 | U251A      | LS5909  | UC2139     | LS3958   |
| TIS73      | LS4391 | U252       | LS5911  | UC2147     | LS3958   |
| TIS74      | LS4392 | U253       | LS5912  | UC2148     | LS3958   |
| TIS75      | LS4393 | U254       | LS4393  | UC2149     | LS3958   |
| TIS88      | LS5912 | U256       | LS4391  | UC220      | LS842    |
| TIXS41     | LS842  | U257       | LS4391  | UC240      | LS842    |
| TIXS42     | LS5905 | U273       | LS5906  | UC241      | LS842    |
| TN4117     | LS5905 | U273A      | LS5906  | UC250      | LS4391   |
| TN4117A    | LS5905 | U274       | LS5906  | UC251      | LS4392   |
| TN4118     | LS5905 | U274A      | LS5906  | UC401      | LS4393   |
| TN4118A    | LS5905 | U275       | LS5906  | UC450      | LS4391   |
| TN4119     | LS5905 | U275A      | LS5906  | UC451      | LS4393   |
| TN4119A    | LS5905 | U280       | LS842   | UC703      | LS845    |
| TN4338     | LS842  | U281       | LS842   | UC704      | LS845    |
| TN4339     | LS842  | U282       | LS842   | UC705      | LS5912   |
| TN4340     | LS842  | U283       | LS842   | UC707      | LS4391   |
| TN4341     | LS842  | U284       | LS842   | UC714      | LS842    |
| TN5114     | LS4391 | U285       | LS842   | UC714E     | LS842    |
| TP5115     | LS4392 | U300       | LS4391  | UC734      | LS5912   |
| TP5116     | LS4393 | U3000      | LS842   | UC734E     | LS5912   |
| U1177      | LS845  | U3001      | LS842   | UC751      | LS842    |
| U1178      | LS842  | U3002      | LS842   | UC752      | LS842    |
| U1179      | LS842  | U301       | LS4392  | UC753      | LS842    |
| U1180      | LS845  | U3011      | LS842   | UC754      | LS842    |
| U1181      | LS845  | U3012      | LS842   | UC755      | LS842    |
| U1182      | LS842  | U304       | LS4391  | UC756      | LS842    |
| U1277      | LS842  | U305       | LS4392  | UC807      | LS4391   |
| U1278      | LS842  | U306       | LS4393  | UX2910     | LS312    |
| U1279      | LS842  | U308       | LS4391  | VCR11N     | LSVCR11N |
| U1280      | LS842  | U309       | LS4391  | VCR12N     | LS3958   |
| U1281      | LS842  | U310       | LS4391  | VCR13N     | LS3958   |
| U1282      | LS842  | U311       | LS4392  | VCR2N      | LS4392   |
| U1283      | LS842  | U320       | LSJ108  | VCR3P      | LS4391   |
| U1284      | LS842  | U321       | LSJ110  | VCR4N      | LS842    |
| U1285      | LS845  | U322       | LSJ108  | VCR6P      | LS4391   |
| U1287      | LS4392 | U350       | LS4391  | VCR7N      | LS832    |
| U1288      | LS842  | U401       | LSU401  | VFW40      | LS122    |
| U1322      | LS845  | U402       | LSU402  | WK5457     | LS842    |
| U1323      | LS845  | U403       | LSU403  | WK5458     | LS842    |
| U1324      | LS845  | U404       | LSU404  | WK5459     | LS842    |
| U1325      | LS845  | U405       | LSU405  | ZDT40      | LS122    |
| U1420      | LS842  | U406       | LSU406  | ZDT41      | LS312    |
| U1421      | LS842  | U410       | LS841   | ZDT42      | LS312    |
| U1422      | LS842  | U411       | LS841   | ZDT44      | LS312    |
| U1714      | LS842  | U412       | LS842   | ZDT45      | LS312    |
| U182       | LS4392 | U421       | LS421   |            |          |
| U183       | LS842  | U422       | LS422   |            |          |
| U1897      | LS4391 | U423       | LS423   |            |          |
| U1898      | LS4392 | U424       | LS424   |            |          |
| U1899      | LS4393 | U425       | LS425   |            |          |
| U197       | LS842  | U426       | LS426   |            |          |
| U198       | LS842  | U427       | LS832   |            |          |
| U199       | LS842  | U428       | LS833   |            |          |
| U200       | LS4393 | U430       | LS4391  |            |          |
| U201       | LS4392 | U431       | LS4391  |            |          |
| U202       | LS4391 | U440       | LS5911  |            |          |
| U2074E     | LS5912 | U441       | LS5912  |            |          |
| U221       | LS4391 | U443       | LS5911  |            |          |
| U222       | LS4391 | U444       | LS5912  |            |          |
| U231       | LS842  | U508       | LS5905  |            |          |
| U231       | LS842  | UC100      | LS842   |            |          |
| U232       | LS842  | UC110      | LS842   |            |          |
| U233       | LS842  | UC115      | LS842   |            |          |
| U234       | LS842  | UC130      | LS842   |            |          |
| U235       | LS842  | UC155      | LS5912  |            |          |
| U240       | LSJ108 | UC1700     | LS3N163 |            |          |
| U241       | LSJ108 | UC1764     | LS3N163 |            |          |
| U242       | LSJ108 | UC20       | LS842   |            |          |
| U243       | LSJ108 | UC200      | LS842   |            |          |
| U248       | LS5906 | UC201      | LS842   |            |          |
| U248A      | LS5906 | UC210      | LS5912  |            |          |
| U249       | LS5907 | UC2130     | LS840   |            |          |
| U249A      | LS5907 | UC2132     | LS3955  |            |          |









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