Advance Data Sheet

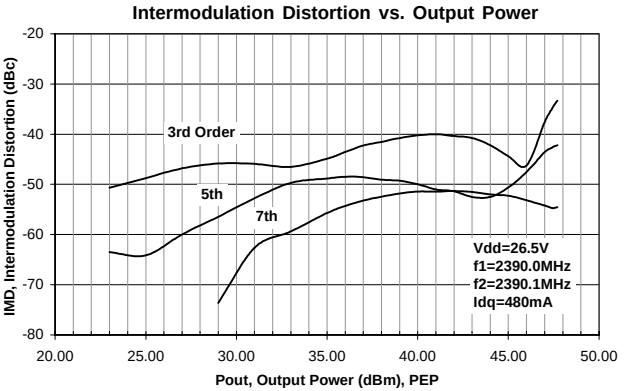
# SL-4524

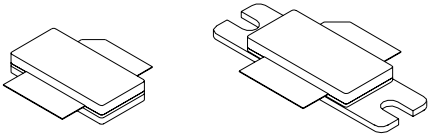
## 2400 MHz 45W
## 26.5V RF Power N-Channel Enhancement Mode LDMOS

## Product Description

The SL-4524 is Stanford Microdevices' high-linearity 45W LDMOS transistor designed for base station applications at or near 2400 MHz. Rated for minimum output power of 45W, it is ideal for CDMA, TDMA, GSM, FM, Single or Multi-Carrier Power Amplifiers in Class A or AB operation.

Patented LDMOS Technology is used to achieve high performance and reliability at a low cost. Dual nitride passivation and gold metallization ensure excellent device performance and reliability.



Model SL-45241 Model SL-45242

Available in pill or flange ceramic packages

## Product Features

- **Patented, High Reliability LDMOS Technology**
- **Low intermodulation distortion: –30dBc at 45W (PEP).**
- **Industry Standard Packages**
- **Surface-Mountable**

## Applications

- **CDMA, TDMA, GSM, FM**
- **Single/Multi-Carrier Applications in Class A or AB operation**

**RF and Functional Tests**
**(Tc=25C unless otherwise specified, Stanford Microdevices broadband fixture)**

| Symbol | Rating | Unit | Min | Typ | Max |
|---|---|---|---|---|---|
| Gplin | Linear Power Gain, Single Tone (CW)<br>(Vds=26.5V, Idq=480mA, Pout=10W, f=2390 MHz) | dB | 7.0 | 8.5 | - |
| Gps | Compressed Power Gain, Single Tone (CW)<br>(Vds=26.5V, Idq=480mA, Pout=45W, f=2390 MHz) | dB | 6.0 | 7.5 | - |
| η | Drain Efficiency, Single Tone (CW)<br>(Vds=26.5V, Idq=480mA, Pout=45W, f=2390 MHz) | % | 25 | 33 | - |
| IMD | Intermodulation Distortion, Two Tone<br>(Vds=26.5V, Idq=480mA, Pout=45W PEP,<br>f1=2390 MHz, f2=2390.1 MHz) | dBc | - | -32 | -30 |
| VSWR | Load Mismatch Survivability<br>(Vds= 26.5V, Idq= 480mA, Pout= 45W, f= 2390 MHz) | - | 10:1 | - | - |

## SL-4524 45W, 26.5V N-Channel Enhancement Mode LDMOS

### *AC Characteristics*

| Symbol | Rating | Unit | Min | Typ | Max |
|---|---|---|---|---|---|
| Coss | Output Capacitance (Vds=26V, Vgs=0V, f=1MHz) | pF | - | 62 | - |
| Crss | Feedback Capacitance (Vds=26V, Vgs=0V, f=1MHz) | pF | - | 2.8 | - |

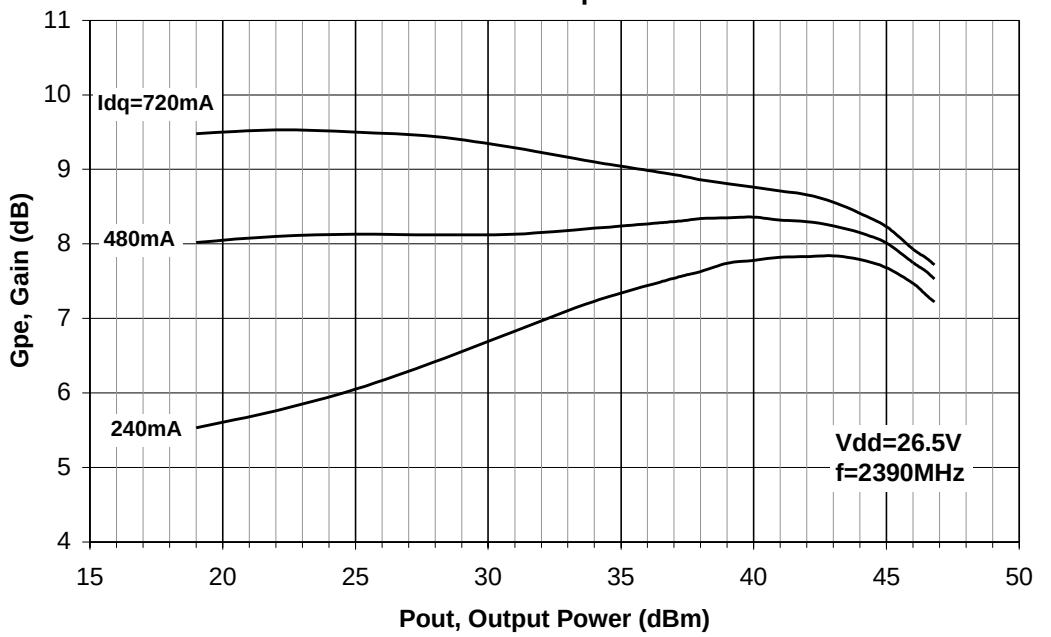
### *Electrical DC Characteristics(Tc=25°C unless otherwise specified)*

| Symbol | Characteristics | Unit | Min | Typ | Max |
|---|---|---|---|---|---|
| BVdss | Drain to Source Voltage, gate connected to source (Vgs=0V, Ids=1mA) | Volts | 65 | - | - |
| Idss | Drain to Source Leakage Current (Vds=28V, Vgs=0) | mA | - | - | 2.0 |
| Igss | Gate to Source Leakage Current (Vgs=20V, Vds=0) | uA | - | - | 2.0 |
| Vth | Threshold Voltage (Vds=10V, Ids=1mA) | Volts | 2.0 | 3.0 | 5.0 |
| Vgs (on) | Gate Quiescent Voltage (Vds=26V, Ids=450mA) | Volts | 3.0 | 4.0 | 6.0 |
| Vds (on) | Drain to Source On Voltage (Vgs=10V, Ids=1A) | Volts | - | 0.14 | |
| Gm | Forward Transconductance (Vds=10V, Ids=5A) | S | 2.2 | 3.0 | - |

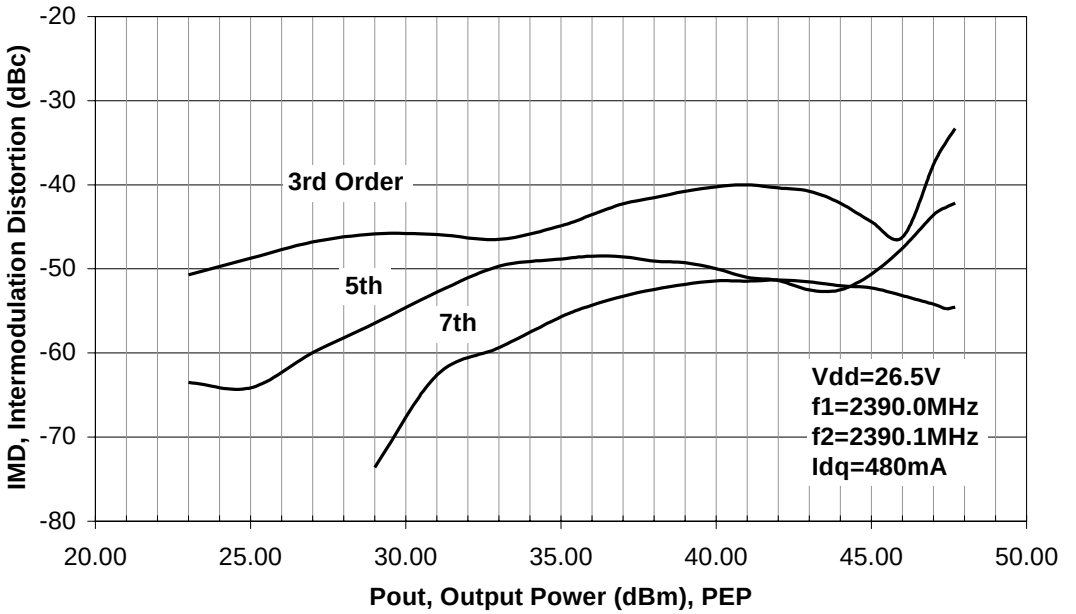
### *Thermal Characteristics*

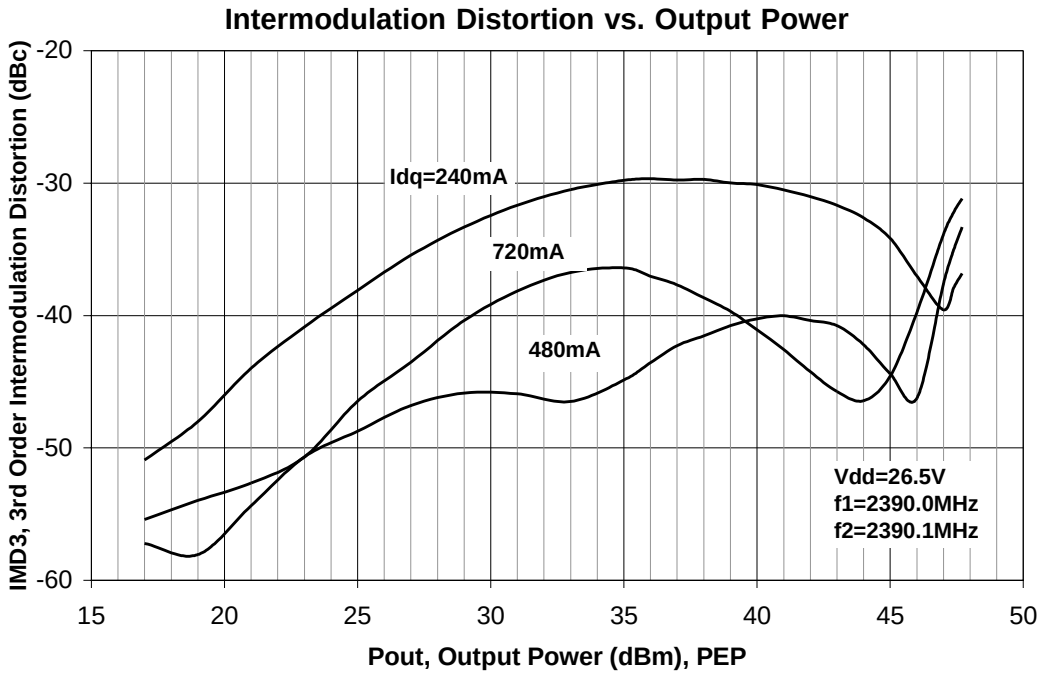
| Symbol | Characteristics | Unit | Min | Typ | Max |
|---|---|---|---|---|---|
| Θjc | Thermal Resistance, Junction to Case | °C/W | - | - | 1.3 |

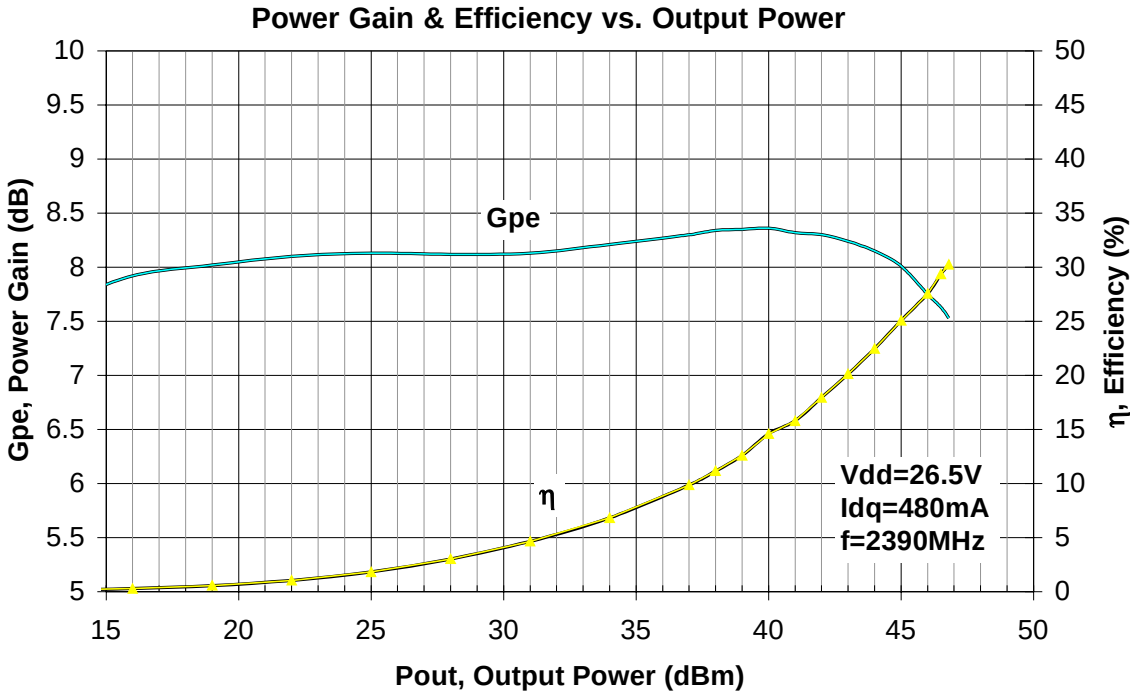
## Power Gain vs Output Power

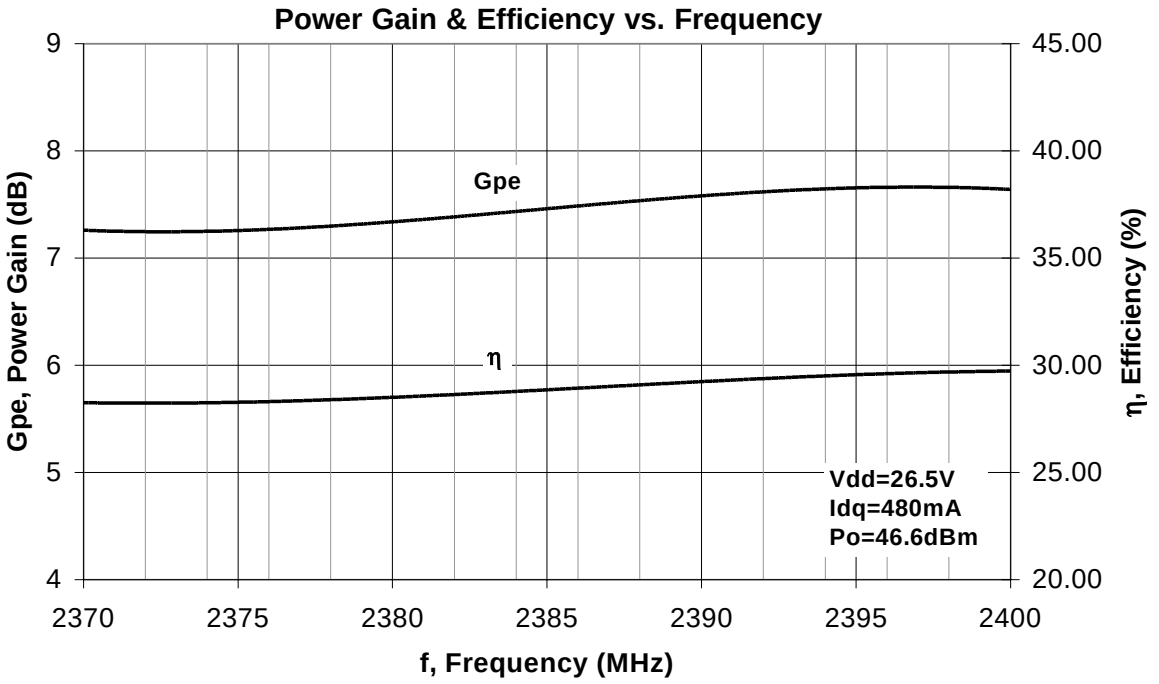


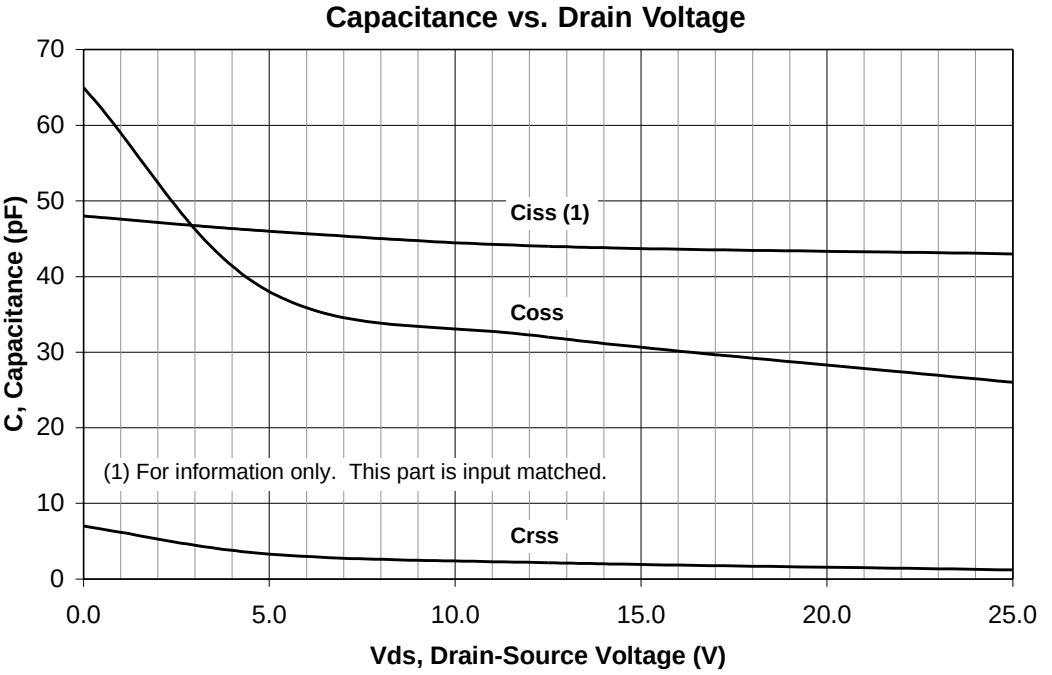

## Intermodulation Distortion vs. Output Power



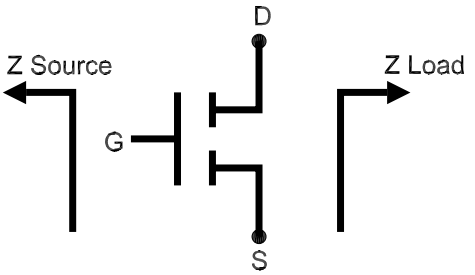

Intermodulation Distortion vs. Output Power
IMD3, 3rd Order Intermodulation Distortion (dBc)
-20
-30
-40
-50
-60
Idq=240mA
720mA
480mA
Vdd=26.5V
f1=2390.0MHz
f2=2390.1MHz
15
20
25
30
35
40
45
50
Pout, Output Power (dBm), PEP


Power Gain & Efficiency vs. Output Power
Gpe, Power Gain (dB)
10
9.5
9
8.5
8
7.5
7
6.5
6
5.5
5
η, Efficiency (%)
50
45
40
35
30
25
20
15
10
5
0
Gpe
η
Vdd=26.5V
Idq=480mA
f=2390MHz
15
20
25
30
35
40
45
50
Pout, Output Power (dBm)


Power Gain & Efficiency vs. Frequency
Gpe, Power Gain (dB)
η, Efficiency (%)
f, Frequency (MHz)
Gpe
η
Vdd=26.5V
Idq=480mA
Po=46.6dBm
9
8
7
6
5
4
45.00
40.00
35.00
30.00
25.00
20.00
2370
2375
2380
2385
2390
2395
2400

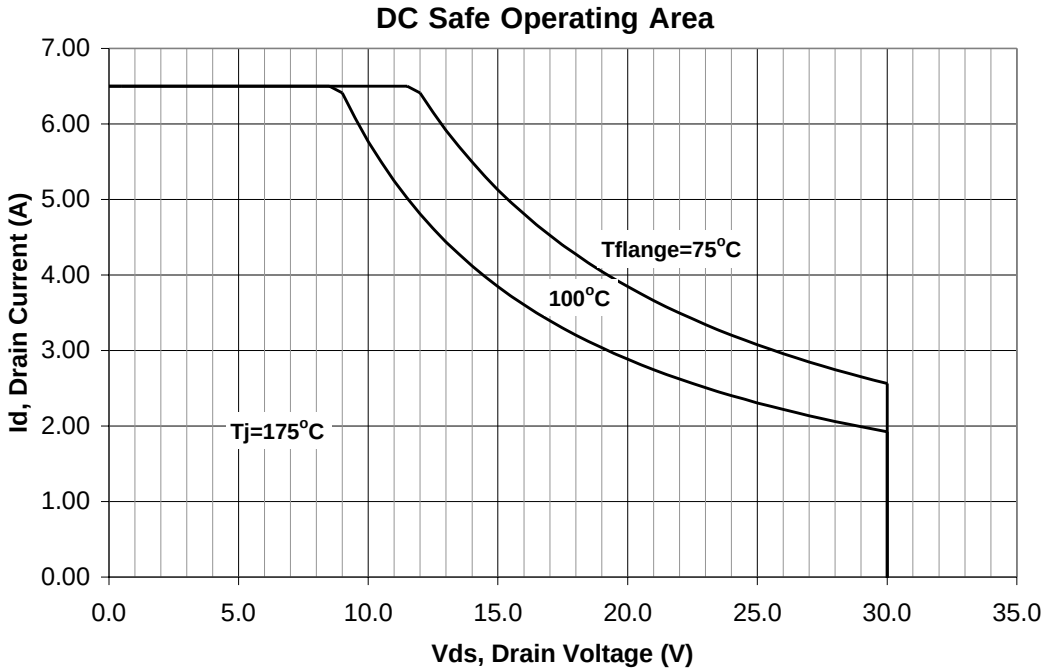

Capacitance vs. Drain Voltage
C, Capacitance (pF)
Vds, Drain-Source Voltage (V)
Ciss (1)
Coss
Crss
(1) For information only. This part is input matched.
70
60
50
40
30
20
10
0
0.0
5.0
10.0
15.0
20.0
25.0

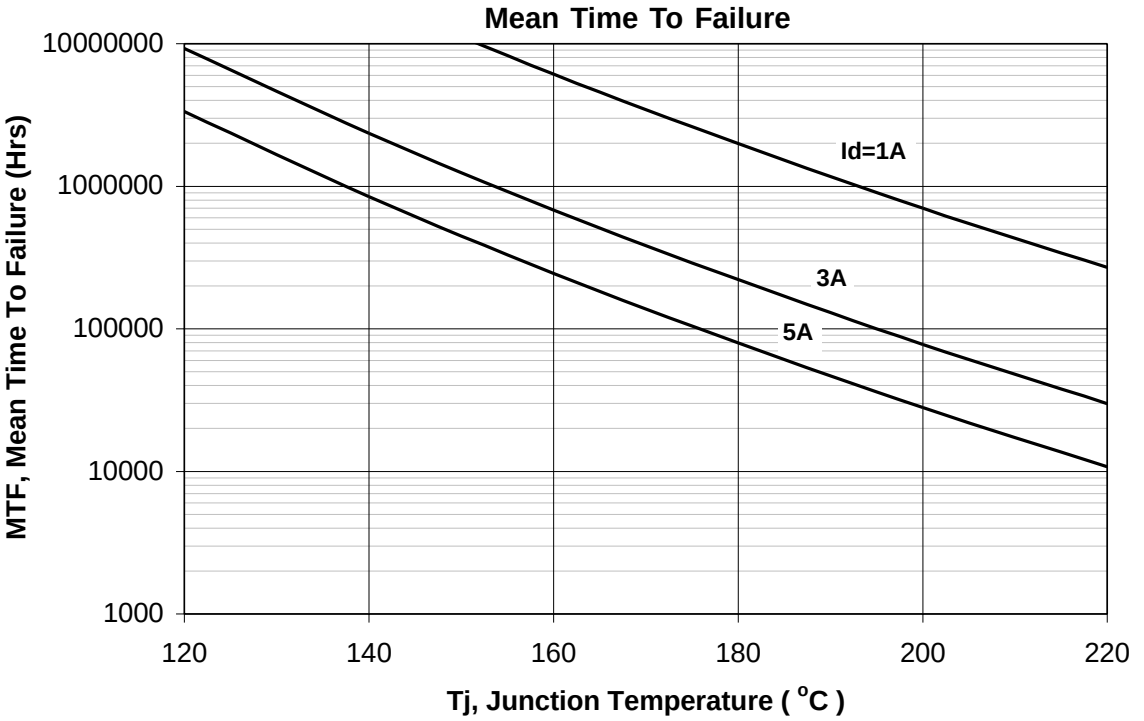
## SL-4524 45W, 26.5V N-Channel Enhancement Mode LDMOS




| Frequency MHz | Z Source | Z Load |
|---|---|---|
| 2330 | 1.71 - j4.76 | 0.31 - j1.55 |
| 2340 | 1.70 - j4.73 | 0.31 - j1.53 |
| 2350 | 1.69 - j4.69 | 0.31 - j1.51 |
| 2360 | 1.68 - j4.66 | 0.31 - j1.49 |
| 2370 | 1.67 - j4.63 | 0.31 - j1.47 |
| 2380 | 1.67 - j4.63 | 0.30 - j1.45 |
| 2390 | 1.67 - j4.60 | 0.30 - j1.44 |
| 2400 | 1.66 - j4.57 | 0.30 - j1.42 |
| 2410 | 1.65 - j4.54 | 0.30 - j1.40 |
| 2420 | 1.64 - j4.48 | 0.30 - j1.38 |
| 2430 | 1.63 - j4.45 | 0.30 - j1.36 |

**Series Equivalent Input and Output Impedances, Vdd= 26.5V, Idq= 480mA**




Mean Time To Failure
MTF, Mean Time To Failure (Hrs)
10000000
1000000
100000
10000
1000
120
140
160
180
200
220
Id=1A
3A
5A
Tj, Junction Temperature ( °C )

# SL-4524 45W, 26.5V N-Channel Enhancement Mode LDMOS

## Absolute Maximum Ratings

| Rating | Symbol | Value | Unit |
|---|---|---|---|
| Drain to Source, gate connected to source | BVdss | 65 | Volts |
| Gate to Source Voltage | BVgs | +/- 20 | Volts |
| Total Device Dissipation @Tcase=70°C<br>Derate above 70°C | Pd | 100<br>0.8 | Watts<br>W/°C |
| Storage Temperature Range | Tstg | -65 to +150 | °C |
| Operating Junction Temperature | $T_J$ | 200 | °C |

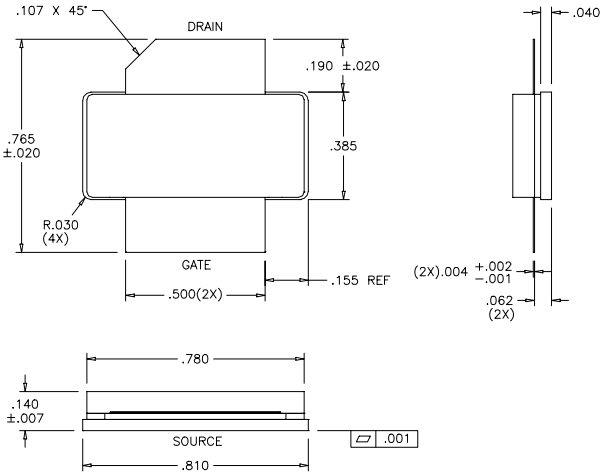
## Part Number Ordering Information

| Part Number | Package |
|---|---|
| SL-45241 | Pill |
| SL-45242 | Flange |

***Caution:***

MOS Devices are susceptable to damage from ElectroStaticDischarge (ESD). Appropriate precautions in handling, packaging and testing MOS devices must be observed.

## Pill Package




Note:
1) Cut lead identifies drain.
2) Dimensions are in inches.
3) Tolerances:
   .XX +/- .01
   .XXX +/- .005

## Flange Package