

# RF Power LDMOS Transistors

## High Ruggedness N-Channel Enhancement-Mode Lateral MOSFETs

These high ruggedness devices are designed for use in high VSWR industrial, medical, broadcast, aerospace and mobile radio applications. Their unmatched input and output design allows for wide frequency range use from 1.8 to 600 MHz.

**Typical Performance:**  $V_{DD} = 50$  Vdc

Frequency (MHz)	Signal Type	$P_{out}$ (W)	$G_{ps}$ (dB)	$\eta_D$ (%)
87.5–108 (1,2)	CW	1309 CW	24.1	77.6
230 (3)	Pulse (100 $\mu$ sec, 20% Duty Cycle)	1250 Peak	23.0	72.3

### Load Mismatch/Ruggedness

Frequency (MHz)	Signal Type	VSWR	$P_{in}$ (W)	Test Voltage	Result
230 (3)	Pulse (100 $\mu$ sec, 20% Duty Cycle)	> 65:1 at all Phase Angles	11.5 Peak (3 dB Overdrive)	50	No Device Degradation

1. Measured in 87.5–108 MHz broadband reference circuit.
2. The values shown are the center band performance numbers across the indicated frequency range.
3. Measured in 230 MHz narrowband test circuit.

### Features

- Unmatched Input and Output Allowing Wide Frequency Range Utilization
- Device can be used Single-Ended or in a Push-Pull Configuration
- Qualified up to a Maximum of 50  $V_{DD}$  Operation
- Characterized from 30 to 50 V for Extended Power Range
- Suitable for Linear Application with Appropriate Biasing
- Integrated ESD Protection with Greater Negative Gate-Source Voltage Range for Improved Class C Operation
- Characterized with Series Equivalent Large-Signal Impedance Parameters
- Recommended drivers: AFT05MS004N (4 W) or MRFE6VS25N (25 W)

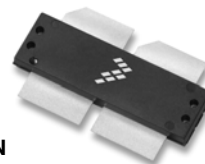
### Typical Applications

- Broadcast
  - FM broadcast
  - HF and VHF broadcast
- Industrial, Scientific, Medical (ISM)
  - CO<sub>2</sub> laser generation
  - Plasma etching
  - Particle accelerators (synchrotrons)
  - MRI
  - Industrial heating/welding
- Aerospace
  - VHF omnidirectional range (VOR)
  - Weather radar
- Mobile Radio
  - HF and VHF communications
  - PMR base stations

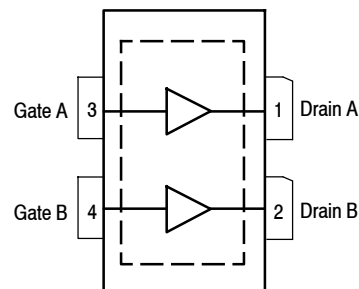
**MRFE6VP61K25N**  
**MRFE6VP61K25GN**

**1.8–600 MHz, 1250 W CW, 50 V**  
**WIDEBAND**  
**RF POWER LDMOS TRANSISTORS**

**OM-1230-4L**  
**PLASTIC**  
**MRE6VP61K25N**



**OM-1230G-4L**  
**PLASTIC**  
**MRE6VP61K25GN**



(Top View)

Note: Exposed backside of the package is the source terminal for the transistors.

**Figure 1. Pin Connections**

**Table 1. Maximum Ratings**

Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	-0.5, +133	Vdc
Gate-Source Voltage	$V_{GS}$	-6.0, +10	Vdc
Storage Temperature Range	$T_{stg}$	-65 to +150	°C
Case Operating Temperature Range	$T_C$	-40 to +150	°C
Operating Junction Temperature Range (1,2)	$T_J$	-40 to +225	°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	3333 16.67	W W/°C

**Table 2. Thermal Characteristics**

Characteristic	Symbol	Value (2,3)	Unit
Thermal Resistance, Junction to Case CW: Case Temperature $109^\circ\text{C}$ , 1250 W CW, 50 Vdc, $I_{DQ(A+B)} = 245$ mA, 98 MHz	$R_{\theta JC}$	0.06	°C/W
Thermal Impedance, Junction to Case Pulse: Case Temperature $74^\circ\text{C}$ , 1250 W Peak, 100 $\mu\text{sec}$ Pulse Width, 20% Duty Cycle, $I_{DQ(A+B)} = 100$ mA, 230 MHz	$Z_{\theta JC}$	0.016	°C/W

**Table 3. ESD Protection Characteristics**

Test Methodology	Class
Human Body Model (per JESD22-A114)	2, passes 2500 V
Machine Model (per EIA/JESD22-A115)	B, passes 250 V
Charge Device Model (per JESD22-C101)	IV, passes 2000 V

**Table 4. Moisture Sensitivity Level**

Test Methodology	Rating	Package Peak Temperature	Unit
Per JESD22-A113, IPC/JEDEC J-STD-020	3	260	°C

**Table 5. Electrical Characteristics** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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**Off Characteristics (4)**

Gate-Source Leakage Current ( $V_{GS} = 5$ Vdc, $V_{DS} = 0$ Vdc)	$I_{GSS}$	—	—	1	$\mu\text{Adc}$
Drain-Source Breakdown Voltage ( $V_{GS} = 0$ Vdc, $I_D = 100$ mAdc)	$V_{(BR)DSS}$	133	—	—	Vdc
Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 50$ Vdc, $V_{GS} = 0$ Vdc)	$I_{DSS}$	—	—	10	$\mu\text{Adc}$
Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 100$ Vdc, $V_{GS} = 0$ Vdc)	$I_{DSS}$	—	—	20	$\mu\text{Adc}$

**On Characteristics**

Gate Threshold Voltage (4) ( $V_{DS} = 10$ Vdc, $I_D = 1776$ $\mu\text{Adc}$ )	$V_{GS(th)}$	1.7	2.2	2.7	Vdc
Gate Quiescent Voltage ( $V_{DD} = 50$ Vdc, $I_{D(A+B)} = 100$ mAdc, Measured in Functional Test)	$V_{GS(Q)}$	1.9	2.4	2.9	Vdc
Drain-Source On-Voltage (4) ( $V_{GS} = 10$ Vdc, $I_D = 2$ Adc)	$V_{DS(on)}$	—	0.2	—	Vdc
Forward Transconductance (4) ( $V_{DS} = 10$ Vdc, $I_D = 30$ Adc)	$g_{fs}$	—	28.0	—	S

1. Continuous use at maximum temperature will affect MTTF.
2. MTTF calculator available at <http://www.freescale.com/rf/calculators>.
3. Refer to [AN1955](#) – *Thermal Measurement Methodology of RF Power Amplifiers*. Go to <http://www.freescale.com/rf> and search AN1955.
4. Each side of device measured separately.

(continued)

**Table 5. Electrical Characteristics** ( $T_A = 25^\circ\text{C}$  unless otherwise noted) (continued)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>Dynamic Characteristics</b>					
Reverse Transfer Capacitance <sup>(1)</sup> ( $V_{DS} = 50\text{ Vdc} \pm 30\text{ mV(rms)ac}$ @ 1 MHz, $V_{GS} = 0\text{ Vdc}$ )	$C_{rss}$	—	2.8	—	pF
Output Capacitance <sup>(1)</sup> ( $V_{DS} = 50\text{ Vdc} \pm 30\text{ mV(rms)ac}$ @ 1 MHz, $V_{GS} = 0\text{ Vdc}$ )	$C_{oss}$	—	185	—	pF
Input Capacitance <sup>(1)</sup> ( $V_{DS} = 50\text{ Vdc}$ , $V_{GS} = 0\text{ Vdc} \pm 30\text{ mV(rms)ac}$ @ 1 MHz)	$C_{iss}$	—	562	—	pF
<b>Functional Tests</b> <sup>(2,3)</sup> (In Freescale Test Fixture, 50 ohm system) $V_{DD} = 50\text{ Vdc}$ , $I_{DQ(A+B)} = 100\text{ mA}$ , $P_{out} = 1250\text{ W Peak}$ (250 W Avg.), $f = 230\text{ MHz}$ , 100 $\mu\text{sec}$ Pulse Width, 20% Duty Cycle					
Power Gain	$G_{ps}$	22.0	23.0	24.5	dB
Drain Efficiency	$\eta_D$	68.5	72.3	—	%
Input Return Loss	IRL	—	-13	-9	dB

**Table 6. Load Mismatch/Ruggedness** (In Freescale Test Fixture, 50 ohm system)  $I_{DQ(A+B)} = 100\text{ mA}$ 

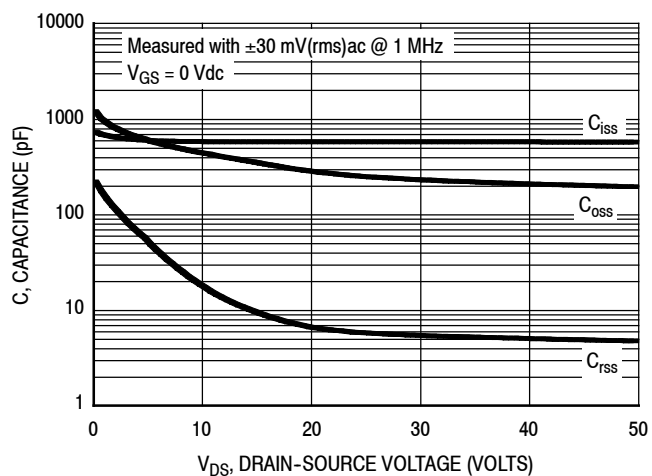
Frequency (MHz)	Signal Type	VSWR	$P_{in}$ (W)	Test Voltage, $V_{DD}$	Result
230	Pulse (100 $\mu\text{sec}$ , 20% Duty Cycle)	> 65:1 at all Phase Angles	11.5 Peak (3 dB Overdrive)	50	No Device Degradation

**Table 7. Ordering Information**

Device	Tape and Reel Information	Package
MRFE6VP61K25NR6	R6 Suffix = 150 Units, 56 mm Tape Width, 13-Reel	OM-1230-4L
MRFE6VP61K25GNR6		OM-1230G-4L

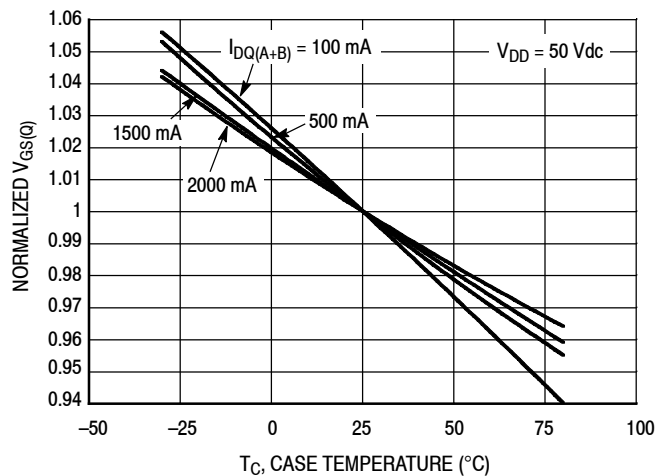
- Each side of device measured separately.
- Devices tested without thermal grease.
- Measurements made with device in straight lead configuration before any lead forming operation is applied. Lead forming is used for gull wing (GN) parts.

### TYPICAL CHARACTERISTICS



**Note:** Each side of device measured separately.

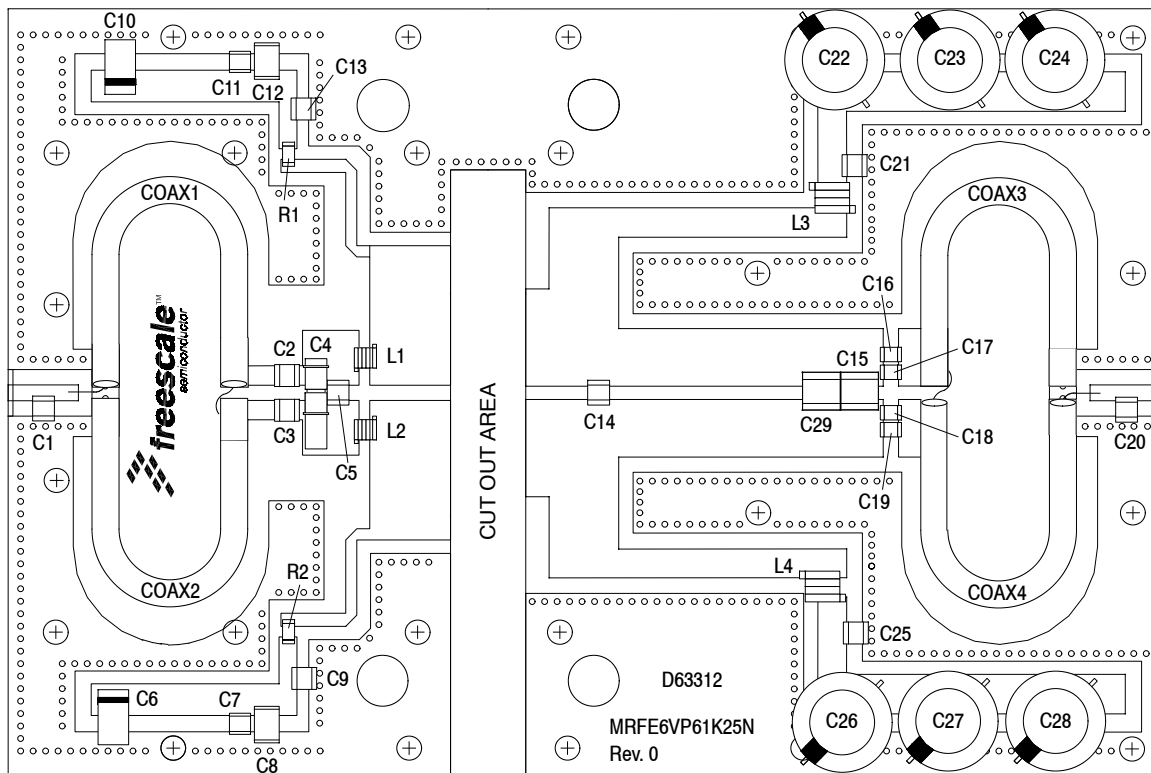
**Figure 2. Capacitance versus Drain-Source Voltage**



$I_{DQ}$ (mA)	Slope (mV/°C)
100	-2.70
500	-2.42
1500	-2.22
2000	-2.05

**Figure 3. Normalized  $V_{GS}$  versus Quiescent Current and Case Temperature**

## 230 MHz NARROWBAND PRODUCTION TEST FIXTURE



**Figure 4. MRFE6VP61K25N Narrowband Test Circuit Component Layout — 230 MHz**

**Table 8. MRFE6VP61K25N Narrowband Test Circuit Component Designations and Values — 230 MHz**

Part	Description	Part Number	Manufacturer
C1	20 pF Chip Capacitor	ATC100B200JT500XT	ATC
C2, C3, C5	27 pF Chip Capacitors	ATC100B270JT500XT	ATC
C4	0.8–8.0 pF Variable Capacitor, Gigatrim	27291SL	Johanson
C6, C10	22 $\mu$ F, 35 V Tantalum Capacitors	T491X226K035AT	Kemet
C7, C11	0.1 $\mu$ F Chip Capacitors	CDR33BX104AKWS	AVX
C8, C12	220 nF Chip Capacitors	C1812C224K5RAC-TU	Kemet
C9, C13, C21, C25	1000 pF Chip Capacitors	ATC100B102JT50XT	ATC
C14	39 pF Chip Capacitor	ATC100B390JT500XT	ATC
C15	39 pF Chip Capacitor	ATC100C390JT250XT	ATC
C16, C17, C18, C19	240 pF Chip Capacitors	ATC100B241JT200XT	ATC
C20	9.1 pF Chip Capacitor	ATC100B9R1BT500XT	ATC
C22, C23, C24, C26, C27, C28	470 $\mu$ F, 63 V Electrolytic Capacitors	MCGPR63V477M13X26-RH	Multicomp
C29	47 pF Chip Capacitor	ATC100C470JT250XT	ATC
Coax1, 2, 3, 4	25 $\Omega$ Semi Rigid Coax, 2.2" Shield Length	UT-141C-25	Micro-Coax
L1, L2	5 nH Inductors	A02TKLC	Coilcraft
L3, L4	6.6 nH Inductors	GA3093-ALC	Coilcraft
R1, R2	10 $\Omega$ , 1/4 W Chip Resistors	CRCW120610R0JNEA	Vishay
PCB	Arlon AD255A 0.030", $\epsilon_r = 2.55$	D63312	MTL

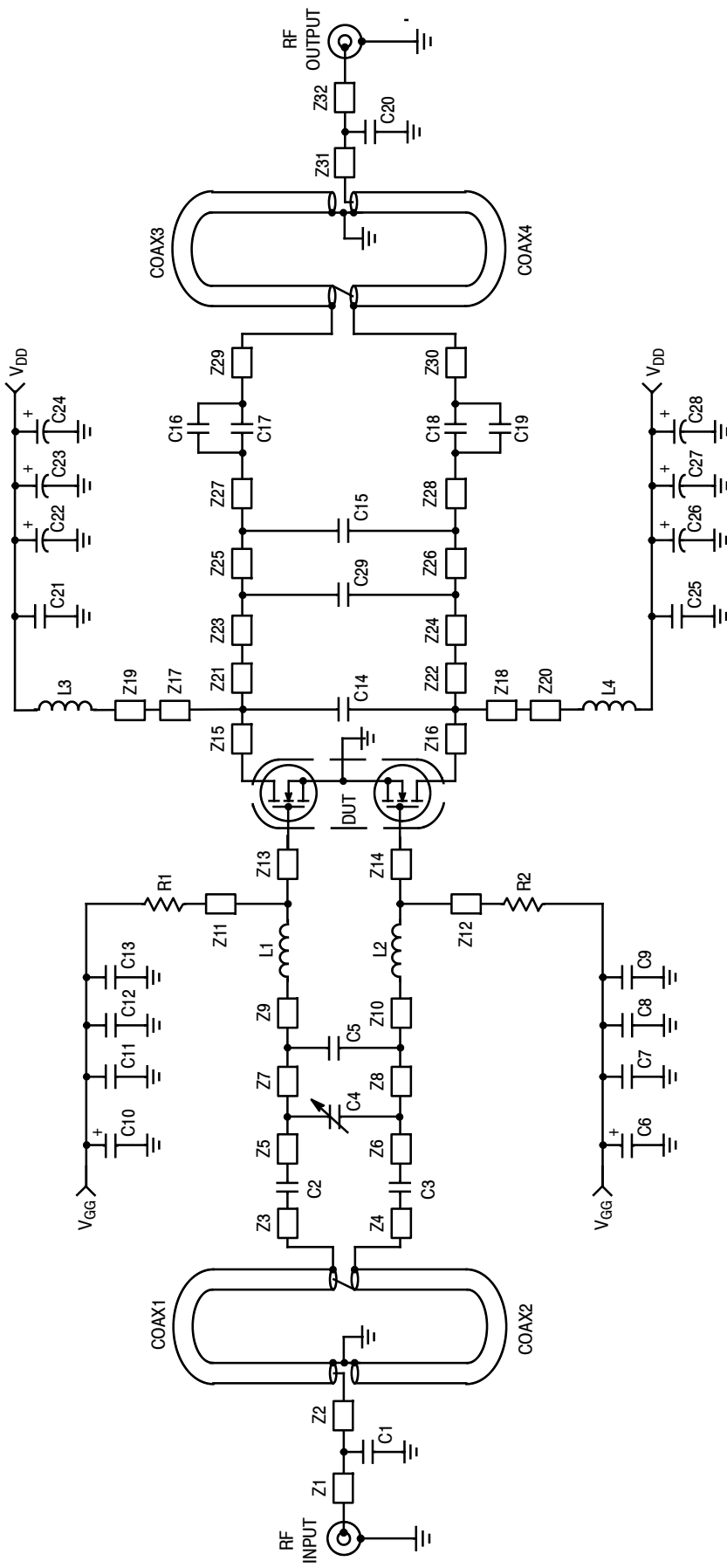


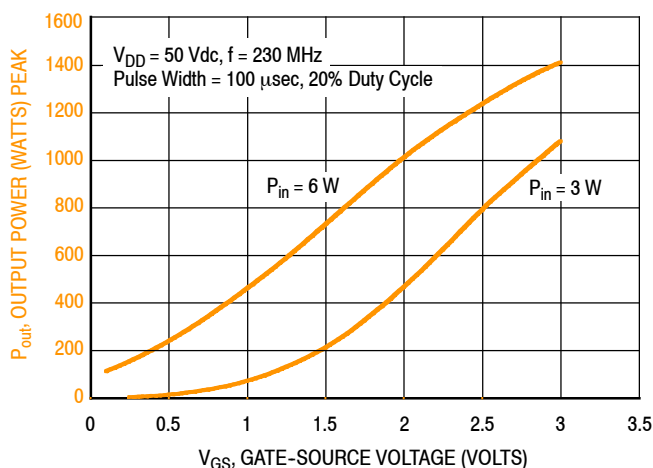
Figure 5. MRFE6VP61K25N Narrowband Test Circuit Schematic — 230 MHz

Table 9. MRFE6VP61K25N Narrowband Test Circuit Microstrips — 230 MHz

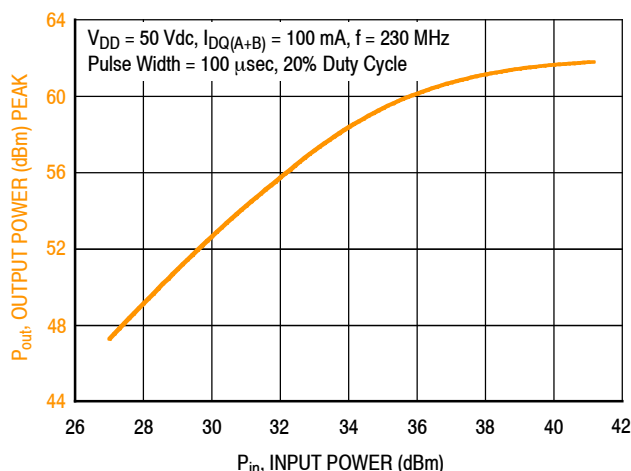
Microstrip	Description
Z1	0.192" x 0.082" Microstrip
Z2	0.175" x 0.082" Microstrip
Z3, Z4	0.170" x 0.100" Microstrip
Z5, Z6	0.116" x 0.285" Microstrip
Z7, Z8	0.116" x 0.285" Microstrip
Z9, Z10	0.108" x 0.285" Microstrip
Z11*, Z12*	0.872" x 0.058" Microstrip
Z13, Z14	0.412" x 0.726" Microstrip
Z15, Z16	0.416" x 0.507" Microstrip
Z17*, Z18*	0.466" x 0.363" Microstrip
Z19*, Z20*	0.187" x 0.154" Microstrip
Z21, Z22	0.059" x 0.507" Microstrip
Z23, Z24	1.006" x 0.300" Microstrip
Z25, Z26	0.247" x 0.300" Microstrip
Z27, Z28	0.125" x 0.300" Microstrip
Z29, Z30	0.116" x 0.300" Microstrip
Z31	0.186" x 0.082" Microstrip
Z32	0.179" x 0.082" Microstrip

\* Line lengths include microstrip bends

### TYPICAL CHARACTERISTICS — 230 MHz

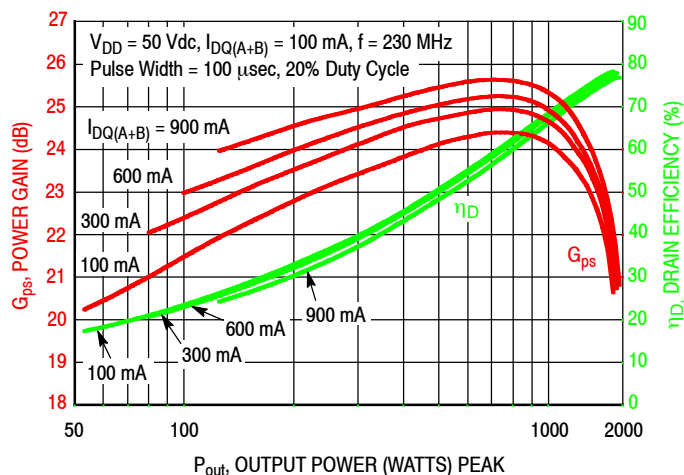


**Figure 6. Output Power versus Gate-Source Voltage at a Constant Input Power**

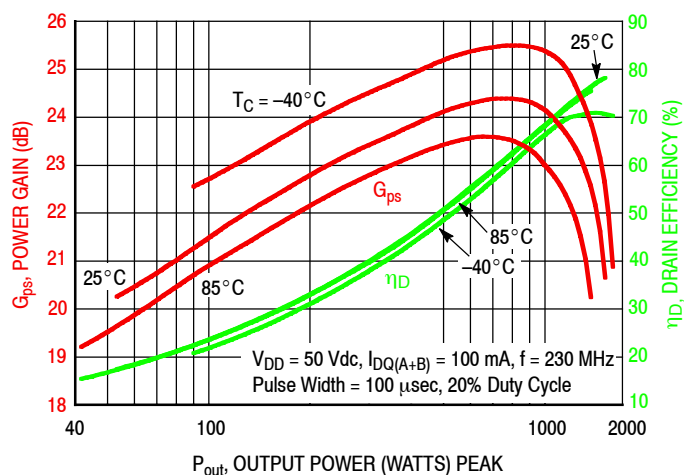


f (MHz)	P1dB (W)	P3dB (W)
230	1295	1518

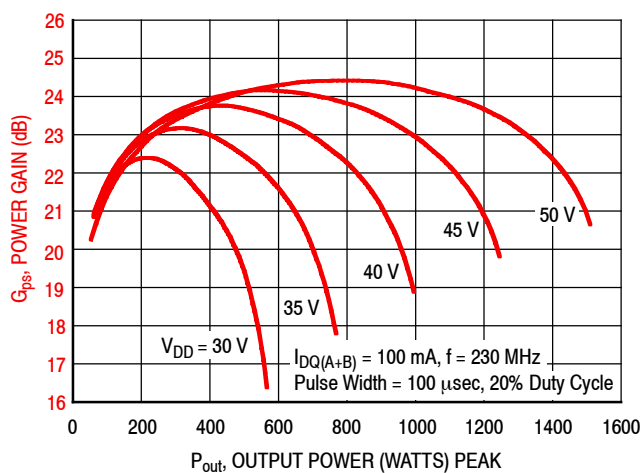
**Figure 7. Output Power versus Input Power**



**Figure 8. Power Gain and Drain Efficiency versus Output Power and Quiescent Current**



**Figure 9. Power Gain and Drain Efficiency versus Output Power**



**Figure 10. Power Gain versus Output Power and Drain-Source Voltage**

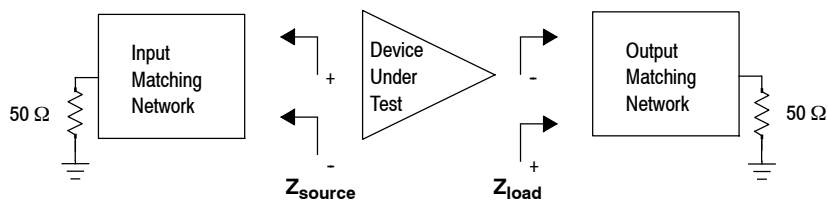
MRFE6VP61K25N MRFE6VP61K25GN

## 230 MHz NARROWBAND PRODUCTION TEST FIXTURE

f MHz	$Z_{\text{source}}$ $\Omega$	$Z_{\text{load}}$ $\Omega$
230	$2.10 + j3.70$	$2.55 + j1.90$

$Z_{\text{source}}$  = Test circuit impedance as measured from gate to gate, balanced configuration.

$Z_{\text{load}}$  = Test circuit impedance as measured from drain to drain, balanced configuration.



**Figure 11. Narrowband Series Equivalent Source and Load Impedance — 230 MHz**



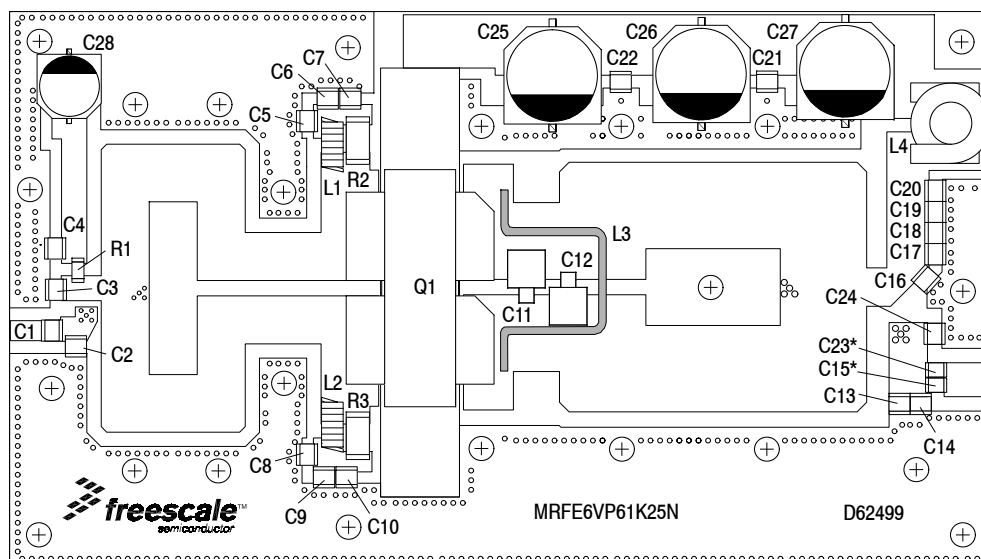
## 87.5–108 MHz BROADBAND REFERENCE CIRCUIT

**Table 10. 87.5–108 MHz Broadband Performance** (In Freescale Reference Circuit, 50 ohm system)

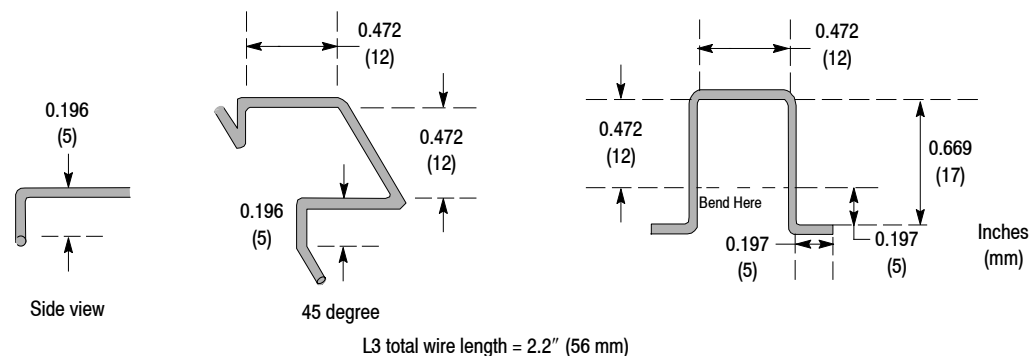
$V_{DD} = 50 \text{ Vdc}$ ,  $I_{DQ(A+B)} = 250 \text{ mA}$ ,  $P_{in} = 5 \text{ W}$ , CW

Frequency (MHz)	$G_{ps}$ (dB)	$\eta_D$ (%)	$P_{out}$ (W)
87.5	23.8	78.3	1212
98	24.1	77.6	1309
108	23.6	77.8	1161

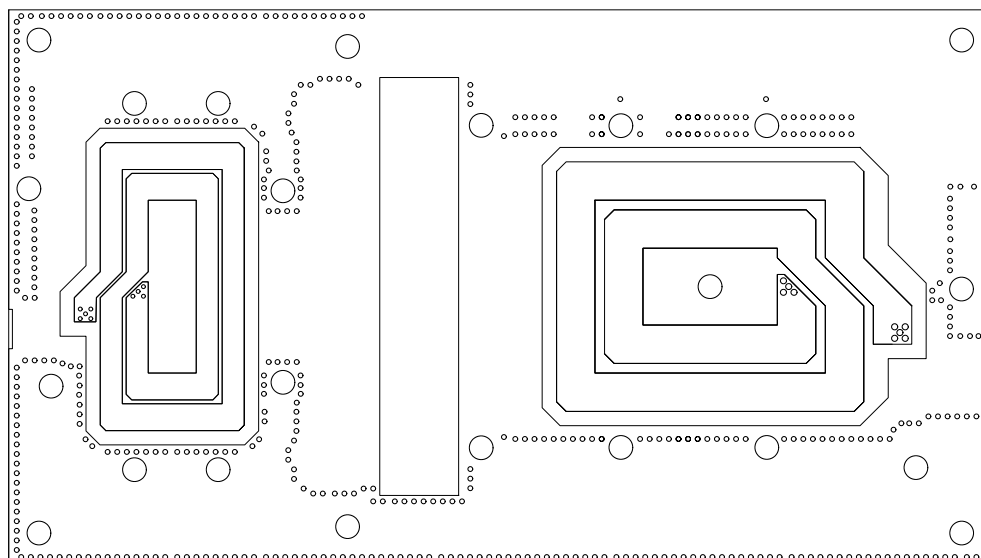
**87.5–108 MHz BROADBAND REFERENCE CIRCUIT — 2.88" x 5.11" (73.1 mm x 130 mm)**



\*C15 and C23 are mounted vertically.



**Figure 12. MRFE6VP61K25N 87.5–108 MHz Broadband Reference Circuit Component Layout**



**Figure 13. MRFE6VP61K25N 87.5–108 MHz Broadband Reference Circuit Component Layout — Bottom**

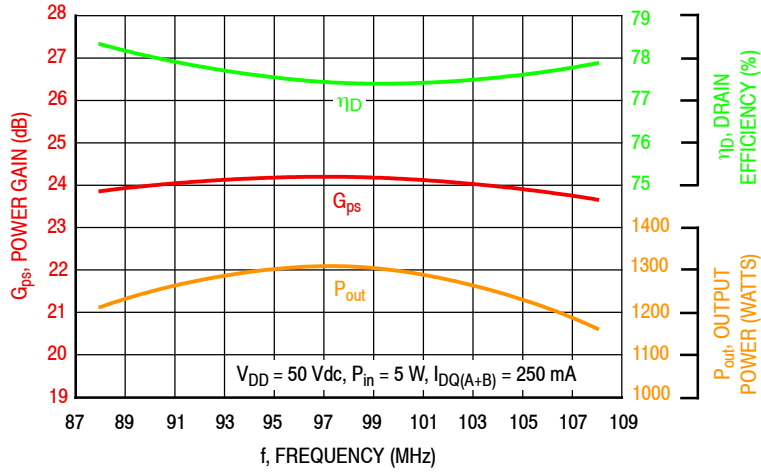
## 87.5–108 MHz BROADBAND REFERENCE CIRCUIT

**Table 11. MRFE6VP61K25N 87.5–108 MHz Broadband Reference Circuit Component Designations and Values**

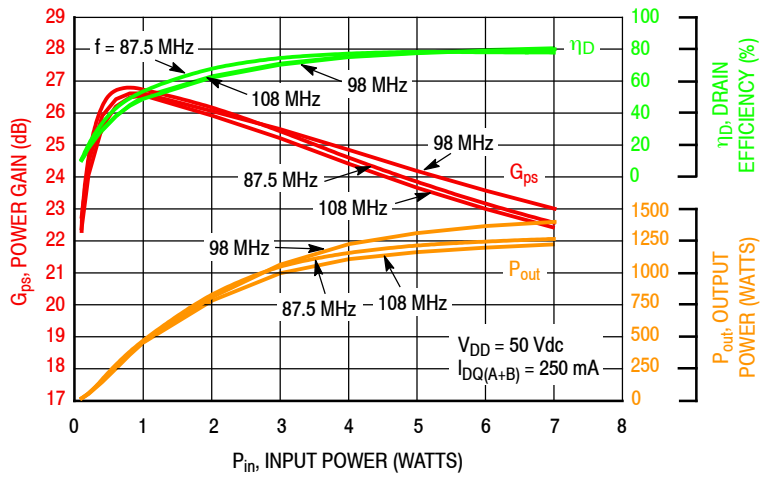
Part	Description	Part Number	Manufacturer
C1, C3, C6, C9, C18, C19, C20, C21, C22	1000 pF Chip Capacitors	ATC100B102JT50XT	ATC
C2	22 pF Chip Capacitor	ATC100B220JT500XT	ATC
C4, C5, C8	10000 pF Chip Capacitors	ATC200B103KT50XT	ATC
C7, C10, C15, C16, C17, C23	470 pF Chip Capacitors	ATC100B471JT200XT	ATC
C11	100 pF, 300 V Mica	MIN02-002EC101J-F	CDE
C12	15 pF, 300 V Mica	MIN02-002CC150J-F	CDE
C13	6.2 pF Chip Capacitor	ATC100B6R2BT500XT	ATC
C14	15 pF Chip Capacitor	ATC100B150JT500XT	ATC
C24	12 pF Chip Capacitor	ATC100B120JT500XT	ATC
C25, C26, C27	220 $\mu$ F, 63 V Electrolytic Capacitors	EEU-FC1J221	Panasonic
C28	22 $\mu$ F, 35 V Electrolytic Capacitor	UUD1V220MCL1GS	Nichicon
L1, L2	17.5 nH Inductors, 6 Turns	B06TJLC	Coilcraft
L3	1.5 mm Non-Tarnish Silver Plated Copper Wire, Total Wire Length = 2.2"/56 mm	SP1500NT-001	—
L4	22 nH Inductor	1212VS-22NMEB	Coilcraft
Q1	RF Power LDMOS Transistor	MRFE6VP61K25NR6	Freescale
R1	10 $\Omega$ , 1/4 W Chip Resistor	CRCW120610R0JNEA	Vishay
R2, R3	33 $\Omega$ , 2 W Chip Resistors	1-2176070-3	TE Connectivity
PCB	Arlon TC350 0.030", $\epsilon_r = 3.5$	D62499	MTL

Note: Refer to MRFE6VP61K25N's [printed circuit boards and schematics](#) to download the 87.5–108 MHz heatsink drawing.

**TYPICAL CHARACTERISTICS — 87.5–108 MHz  
BROADBAND REFERENCE CIRCUIT**

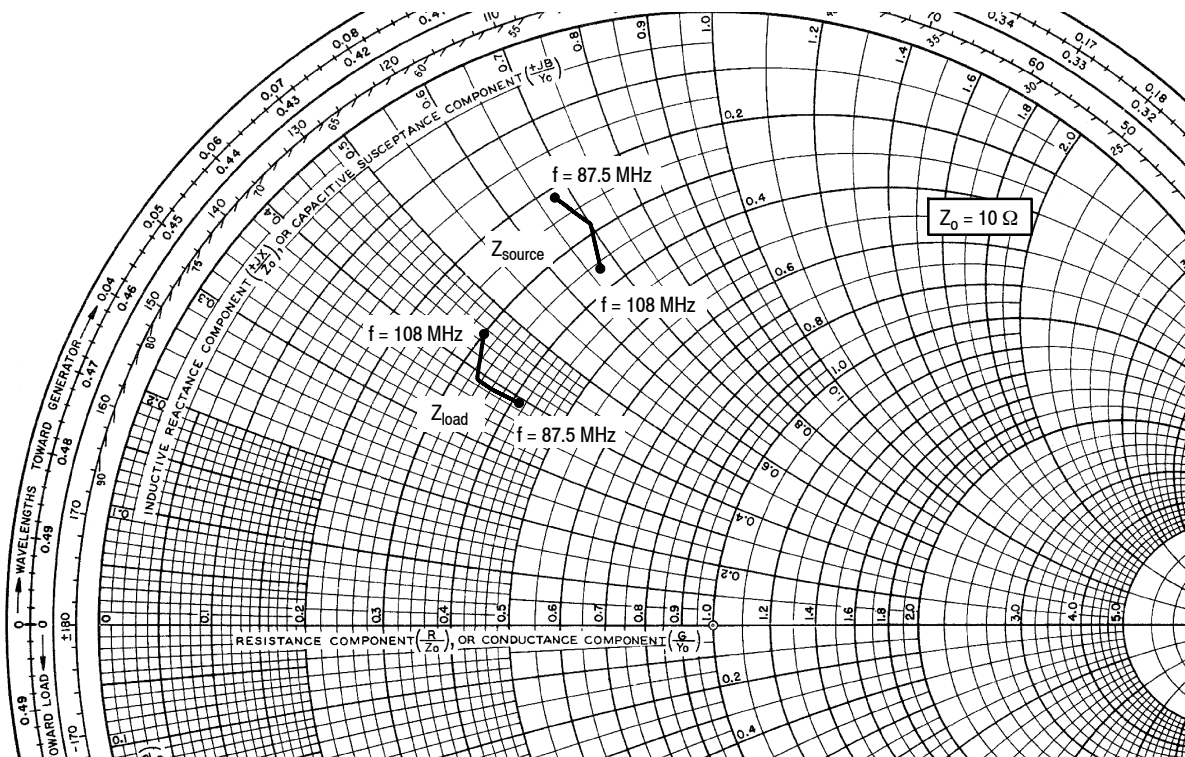


**Figure 14. Power Gain, Drain Efficiency and CW Output Power versus Frequency**



**Figure 15. Power Gain, Drain Efficiency and CW Output Power versus Input Power and Frequency**

### 87.5–108 MHz BROADBAND REFERENCE CIRCUIT



f MHz	Z <sub>source</sub> Ω	Z <sub>load</sub> Ω
87.5	2.10 + j6.67	4.11 + j3.87
98	2.80 + j6.96	3.33 + j3.85
108	3.60 + j6.65	2.97 + j4.45

Z<sub>source</sub> = Test circuit impedance as measured from gate to gate, balanced configuration.

Z<sub>load</sub> = Test circuit impedance as measured from drain to drain, balanced configuration.

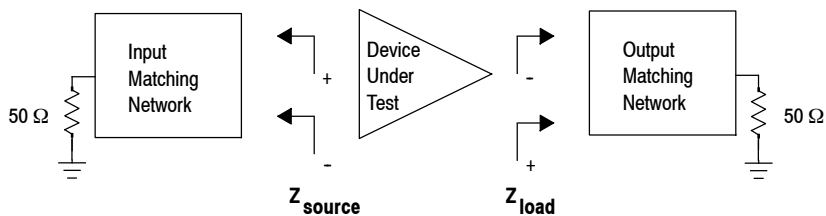
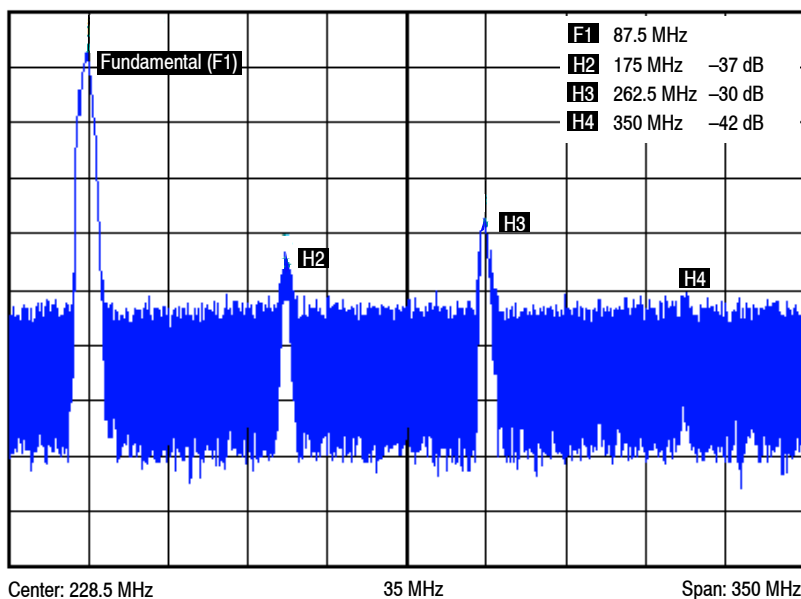


Figure 16. Broadband Series Equivalent Source and Load Impedance — 87.5–108 MHz

**HARMONIC MEASUREMENTS — 87.5–108 MHz  
BROADBAND REFERENCE CIRCUIT**

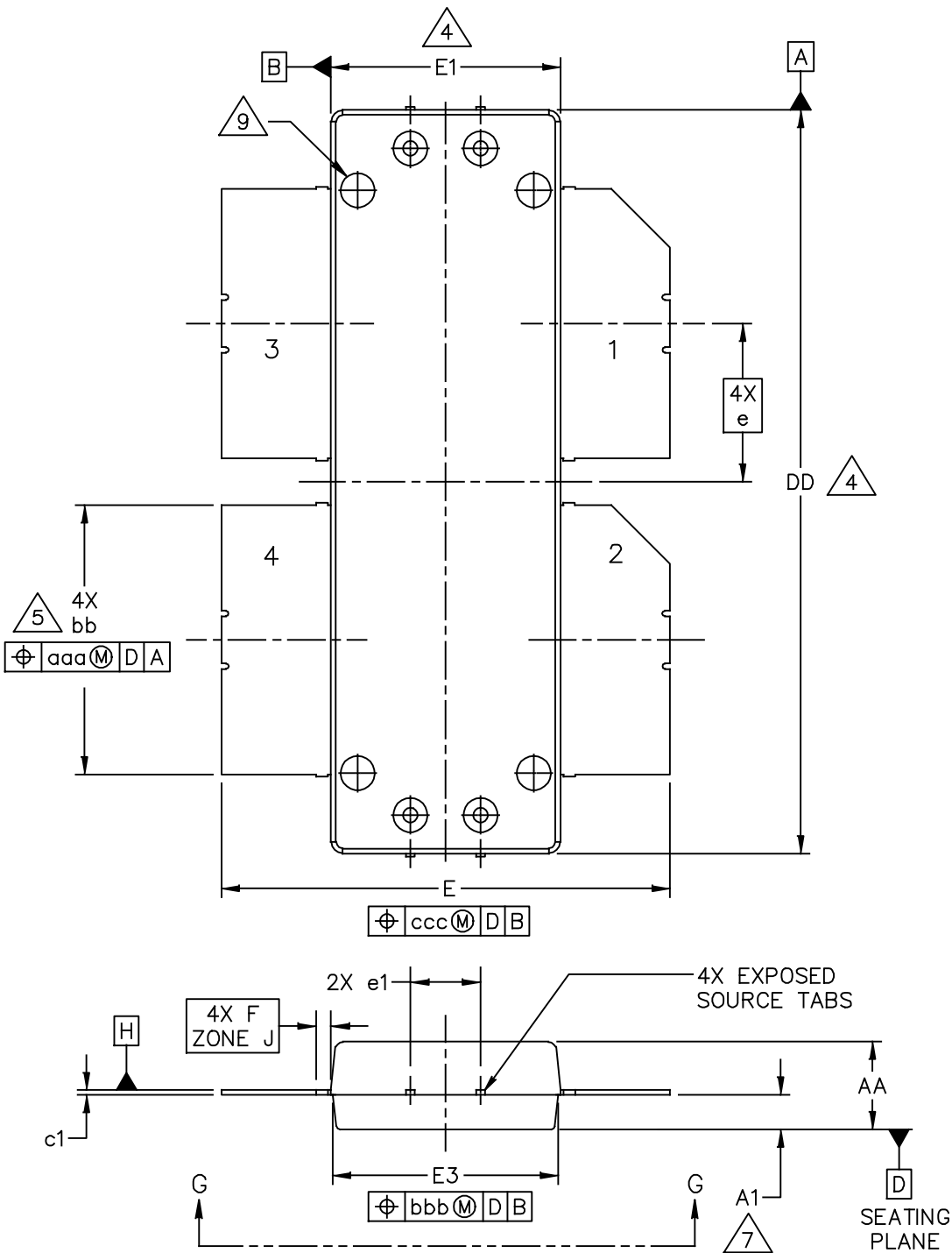


<b>F1</b>	87.5 MHz
<b>H2</b>	175 MHz -37 dB
<b>H3</b>	262.5 MHz -30 dB
<b>H4</b>	350 MHz -42 dB

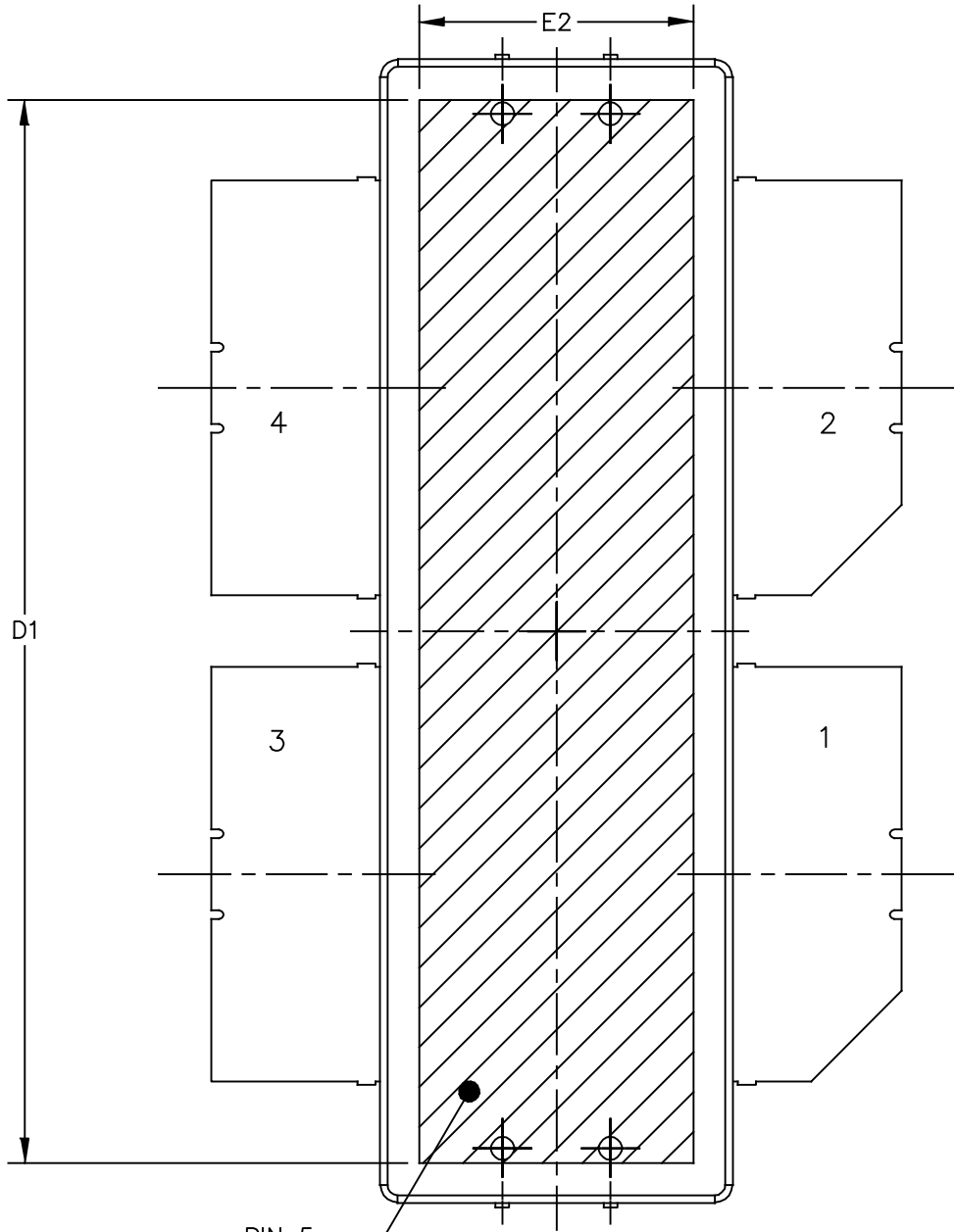
<b>H2 (175 MHz)</b>	<b>H3 (262.5 MHz)</b>	<b>H4 (350 MHz)</b>
-37 dB	-30 dB	-42 dB

**Figure 17. 87.5 MHz Harmonics @ 1215 W CW**

PACKAGE DIMENSIONS



© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.	MECHANICAL OUTLINE	PRINT VERSION NOT TO SCALE
TITLE:  OM-1230-4L	DOCUMENT NO: 98ASA00506D	REV: B
	STANDARD: NON-JEDEC	
	03 DEC 2014	



PIN 5  
  
 BOTTOM VIEW  
 VIEW G-G

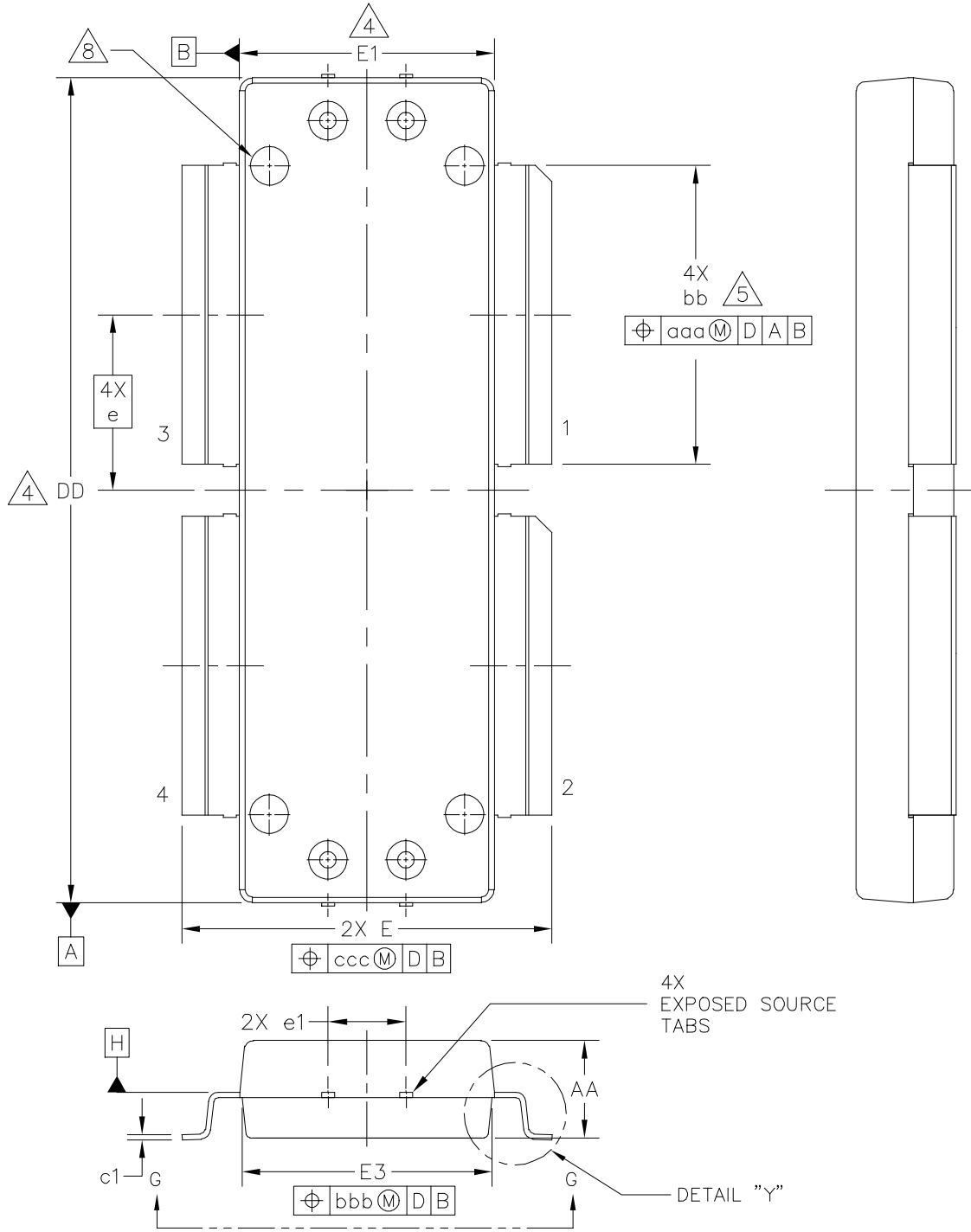
© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.	MECHANICAL OUTLINE	PRINT VERSION NOT TO SCALE
TITLE:  OM-1230-4L	DOCUMENT NO: 98ASA00506D      REV: B	STANDARD: NON-JEDEC
	03 DEC 2014	



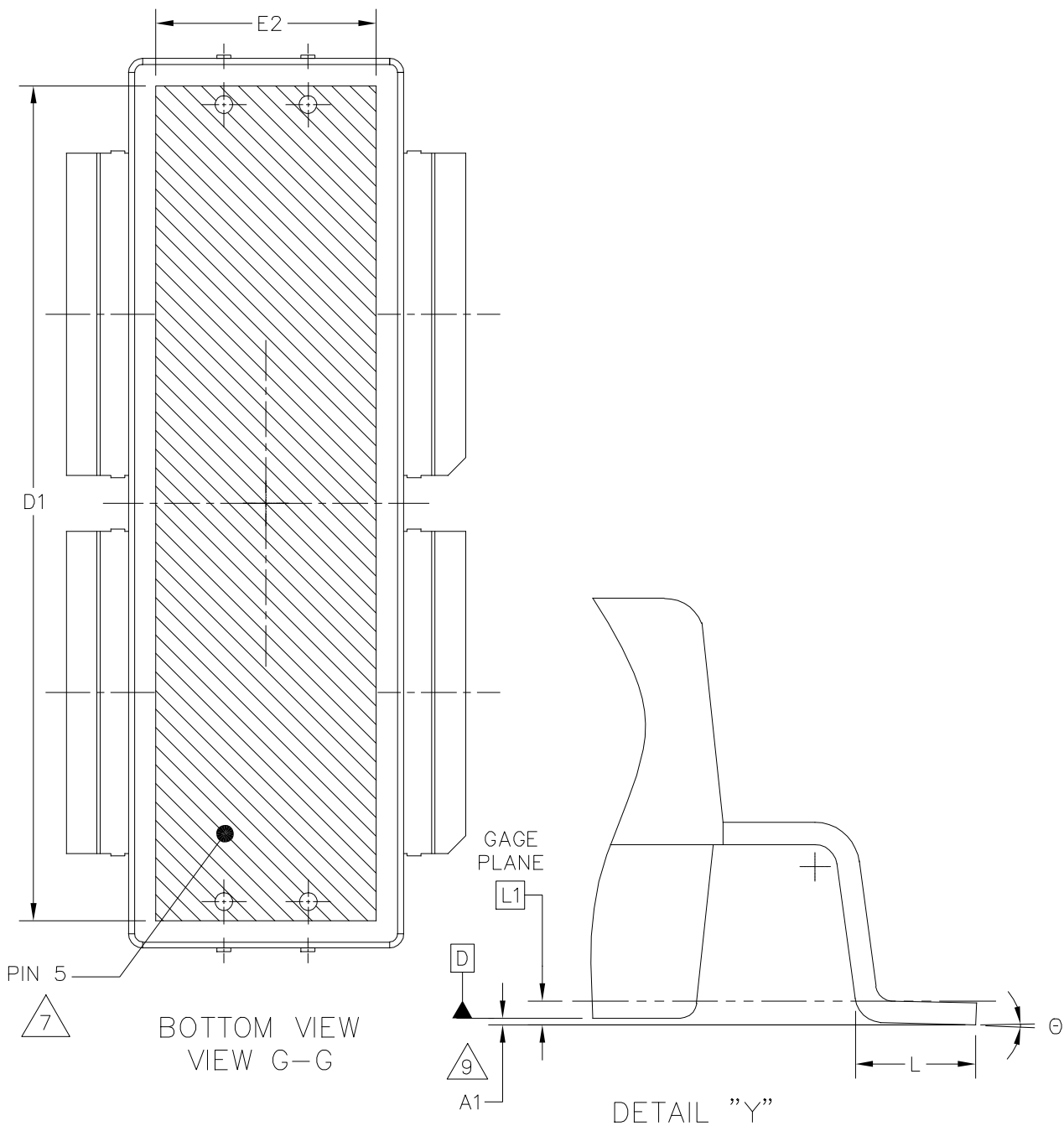
NOTES:

1. CONTROLLING DIMENSION: INCH
2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
3. DATUM PLANE H IS LOCATED AT TOP OF LEAD AND IS COINCIDENT WITH THE LEAD WHERE THE LEAD EXITS THE PLASTIC BODY AT THE TOP OF THE PARTING LINE.
4. DIMENSIONS DD AND E1 DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE PROTRUSION IS .006 INCH (0.15 MM) PER SIDE. DIMENSIONS DD AND E1 DO INCLUDE MOLD MISMATCH AND ARE DETERMINED AT DATUM PLANE H.
5. DIMENSION bb DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE .005 INCH (0.13 MM) TOTAL IN EXCESS OF THE bb DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. DATUMS A AND B TO BE DETERMINED AT DATUM PLANE H.
7. DIMENSION A1 APPLIES WITHIN ZONE J ONLY.
8. HATCHING REPRESENTS THE EXPOSED AREA OF THE HEAT SLUG. THE DIMENSIONS D1 AND E2 REPRESENT THE VALUES BETWEEN THE TWO OPPOSITE POINTS ALONG THE EDGES OF EXPOSED AREA OF HEAT SLUG.
9. DIMPLED HOLE REPRESENTS INPUT SIDE.

DIM	INCH		MILLIMETER		DIM	INCH		MILLIMETER	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
AA	.148	.152	3.76	3.86	bb	.457	.463	11.61	11.76
A1	.059	.065	1.50	1.65	c1	.007	.011	0.18	0.28
DD	1.267	1.273	32.18	32.33	e	.270 BSC		6.86 BSC	
D1	1.180	-----	29.97	-----	e1	.116	.124	2.95	3.15
E	.762	.770	19.35	19.56					
E1	.390	.394	9.91	10.01	aaa	.004		0.10	
E2	.306	-----	7.77	-----	bbb	.006		0.15	
E3	.383	.387	9.73	9.83	ccc	.010		0.25	
F	.025 BSC		0.635 BSC						
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NOTES:

1. CONTROLLING DIMENSION: INCH
2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
3. DATUM PLANE H IS LOCATED AT TOP OF LEAD AND IS COINCIDENT WITH THE LEAD WHERE THE LEAD EXITS THE PLASTIC BODY AT THE TOP OF THE PARTING LINE.
4. DIMENSIONS DD AND E1 DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE PROTRUSION IS .006 INCH (0.15 MM) PER SIDE. DIMENSIONS DD AND E1 DO INCLUDE MOLD MISMATCH AND ARE DETERMINED AT DATUM PLANE H.
5. DIMENSION bb DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE .005 INCH (0.13 MM) TOTAL IN EXCESS OF THE bb DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. DATUMS A AND B TO BE DETERMINED AT DATUM PLANE H.
7. HATCHING REPRESENTS THE EXPOSED AND SOLDERABLE AREA OF THE HEAT SLUG. THE DIMENSIONS D1 AND E2 REPRESENT THE VALUES BETWEEN THE TWO OPPOSITE POINTS ALONG THE EDGES OF EXPOSED AREA OF HEAT SLUG.
8. DIMPLED HOLE REPRESENTS INPUT SIDE.
9. DIMENSION A1 IS MEASURED WITH REFERENCE TO DATUM D. THE POSITIVE VALUE IMPLIES THAT THE BOTTOM OF THE PACKAGE IS HIGHER THAN THE BOTTOM OF THE LEAD.

DIM	INCH		MILLIMETER		DIM	INCH		MILLIMETER	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
AA	.148	.152	3.76	3.86	bb	.457	.463	11.61	11.76
A1	-.003	.003	-0.08	0.08	c1	.007	.011	0.18	0.28
DD	1.267	1.273	32.18	32.33	e	.270 BSC		6.86 BSC	
D1	1.180	----	29.97	----	e1	.116	.124	2.95	3.15
E	.563	.575	14.30	14.61	θ	0°	8°	0°	8°
E1	.390	.394	9.91	10.01	aaa	.004		0.10	
E2	.306	----	7.77	----	bbb	.006		0.15	
E3	.383	.387	9.73	9.83	ccc	.010		0.25	
L	.034	.046	0.86	1.17					
L1	.010 BSC		0.25 BSC						

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Refer to the following resources to aid your design process.

**Application Notes**

- AN1907: Solder Reflow Attach Method for High Power RF Devices in Over-Molded Plastic Packages
- AN1955: Thermal Measurement Methodology of RF Power Amplifiers

**Engineering Bulletins**

- EB212: Using Data Sheet Impedances for RF LDMOS Devices

**White Paper**

- RFPLASTICWP: Designing with Plastic RF Power Transistors

**Software**

- Electromigration MTTF Calculator
- RF High Power Model
- .s2p File

**Development Tools**

- Printed Circuit Boards

**To Download Resources Specific to a Given Part Number:**

1. Go to <http://www.freescale.com/rf>
2. Search by part number
3. Click part number link
4. Choose the desired resource from the drop down menu

**REVISION HISTORY**

The following table summarizes revisions to this document.

Revision	Date	Description
0	Feb. 2015	<ul style="list-style-type: none"> <li>• Initial Release of Data Sheet</li> </ul>
1	Feb. 2015	<ul style="list-style-type: none"> <li>• Table 2, Maximum Ratings: added Total Device Dissipation, p. 2</li> <li>• Table 3, Thermal Characteristics: added CW Thermal Resistance, p. 2</li> <li>• Added Fig. 11, Narrowband Series Equivalent Source and Load Impedance - 230 MHz, p. 8</li> </ul>
2	Apr. 2015	<ul style="list-style-type: none"> <li>• Added part number MRFE6VP61K25GN, p. 1</li> <li>• Added OM-1230G-4L package photo, p. 1, and Mechanical Outline, pp. 18-20</li> </ul>

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