



MRF6S9045NR1 replaced by MRFE6S9045NR1. Refer to Device Migration PCN12895 for more details. MRF6S9045NBR1 no longer manufactured.

## RF Power Field Effect Transistors

### N-Channel Enhancement-Mode Lateral MOSFETs

Designed for broadband commercial and industrial applications with frequencies up to 1000 MHz. The high gain and broadband performance of these devices make them ideal for large-signal, common-source amplifier applications in 28 volt base station equipment.

- Typical Single-Carrier N-CDMA Performance @ 880 MHz,  $V_{DD} = 28$  Volts,  $I_{DQ} = 350$  mA,  $P_{out} = 10$  Watts Avg., IS-95 CDMA (Pilot, Sync, Paging, Traffic Codes 8 Through 13) Channel Bandwidth = 1.2288 MHz. PAR = 9.8 dB @ 0.01% Probability on CCDF.  
 Power Gain — 22.7 dB  
 Drain Efficiency — 32%  
 ACPR @ 750 kHz Offset — -47 dBc in 30 kHz Bandwidth

#### GSM EDGE Application

- Typical GSM EDGE Performance:  $V_{DD} = 28$  Volts,  $I_{DQ} = 350$  mA,  $P_{out} = 16$  Watts Avg., Full Frequency Band (921-960 MHz)  
 Power Gain — 20 dB  
 Drain Efficiency — 46%  
 Spectral Regrowth @ 400 kHz Offset = -62 dBc  
 Spectral Regrowth @ 600 kHz Offset = -78 dBc  
 EVM — 1.5% rms

#### GSM Application

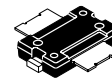
- Typical GSM Performance:  $V_{DD} = 28$  Volts,  $I_{DQ} = 350$  mA,  $P_{out} = 45$  Watts, Full Frequency Band (921-960 MHz)  
 Power Gain — 20 dB  
 Drain Efficiency — 68%
- Capable of Handling 5:1 VSWR, @ 28 Vdc, 880 MHz, 45 Watts CW Output Power

#### Features

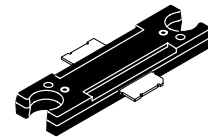
- Characterized with Series Equivalent Large-Signal Impedance Parameters
- Integrated ESD Protection
- 225°C Capable Plastic Package
- N Suffix Indicates Lead-Free Terminations. RoHS Compliant.
- TO-270-2 in Tape and Reel. R1 Suffix = 500 Units per 24 mm, 13 inch Reel.
- TO-272-2 in Tape and Reel. R1 Suffix = 500 Units per 44 mm, 13 inch Reel.

**MRF6S9045NR1**  
**MRF6S9045NBR1**

**880 MHz, 10 W AVG., 28 V**  
**SINGLE N-CDMA**  
**LATERAL N-CHANNEL**  
**BROADBAND RF POWER MOSFETs**



**CASE 1265-09, STYLE 1**  
**TO-270-2**  
**PLASTIC**  
**MRF6S9045NR1**



**CASE 1337-04, STYLE 1**  
**TO-272-2**  
**PLASTIC**  
**MRF6S9045NBR1**

ARCHIVE INFORMATION

ARCHIVE INFORMATION

**Table 1. Maximum Ratings**

Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	- 0.5, +68	Vdc
Gate-Source Voltage	$V_{GS}$	- 0.5, +12	Vdc
Storage Temperature Range	$T_{stg}$	- 65 to +150	°C
Case Operating Temperature	$T_C$	150	°C
Operating Junction Temperature (1,2)	$T_J$	225	°C

1. Continuous use at maximum temperature will affect MTTF.
2. MTTF calculator available at <http://www.freescale.com/rtf>. Select Software & Tools/Development Tools/Calculators to access MTTF calculators by product.

**Table 2. Thermal Characteristics**

Characteristic	Symbol	Value (1,2)	Unit
Thermal Resistance, Junction to Case Case Temperature 81°C, 45 W CW Case Temperature 79°C, 10 W CW	$R_{\theta JC}$	1.0 1.1	°C/W

**Table 3. ESD Protection Characteristics**

Test Methodology	Class
Human Body Model (per JESD22-A114)	1A (Minimum)
Machine Model (per EIA/JESD22-A115)	A (Minimum)
Charge Device Model (per JESD22-C101)	IV (Minimum)

**Table 4. Moisture Sensitivity Level**

Test Methodology	Rating	Package Peak Temperature	Unit
Per JESD 22-A113, IPC/JEDEC J-STD-020	3	260	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

**Off Characteristics**

Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 68\text{ Vdc}$ , $V_{GS} = 0\text{ Vdc}$ )	$I_{DSS}$	—	—	10	$\mu\text{Adc}$
Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 28\text{ Vdc}$ , $V_{GS} = 0\text{ Vdc}$ )	$I_{DSS}$	—	—	1	$\mu\text{Adc}$
Gate-Source Leakage Current ( $V_{GS} = 5\text{ Vdc}$ , $V_{DS} = 0\text{ Vdc}$ )	$I_{GSS}$	—	—	1	$\mu\text{Adc}$

**On Characteristics**

Gate Threshold Voltage ( $V_{DS} = 10\text{ Vdc}$ , $I_D = 200\ \mu\text{A}$ )	$V_{GS(th)}$	1	2	3	Vdc
Gate Quiescent Voltage ( $V_{DD} = 28\text{ Vdc}$ , $I_D = 350\text{ mAdc}$ , Measured in Functional Test)	$V_{GS(Q)}$	2	2.9	4	Vdc
Drain-Source On-Voltage ( $V_{GS} = 10\text{ Vdc}$ , $I_D = 1.0\text{ Adc}$ )	$V_{DS(on)}$	—	0.22	0.3	Vdc

**Dynamic Characteristics**

Input Capacitance ( $V_{DS} = 28\text{ Vdc}$ , $V_{GS} = 0\text{ Vdc} \pm 30\text{ mV(rms)ac}$ @ 1 MHz)	$C_{iss}$	—	77	—	pF
Output Capacitance ( $V_{DS} = 28\text{ Vdc} \pm 30\text{ mV(rms)ac}$ @ 1 MHz, $V_{GS} = 0\text{ Vdc}$ )	$C_{oss}$	—	27	—	pF
Reverse Transfer Capacitance ( $V_{DS} = 28\text{ Vdc} \pm 30\text{ mV(rms)ac}$ @ 1 MHz, $V_{GS} = 0\text{ Vdc}$ )	$C_{rss}$	—	0.78	—	pF

**Functional Tests** (In Freescale Test Fixture, 50 ohm system)  $V_{DD} = 28\text{ Vdc}$ ,  $I_{DQ} = 350\text{ mA}$ ,  $P_{out} = 10\text{ W Avg.}$ ,  $f = 880\text{ MHz}$ , Single-Carrier N-CDMA, 1.2288 MHz Channel Bandwidth Carrier. ACPR measured in 30 kHz Channel Bandwidth @  $\pm 750\text{ kHz}$  Offset. PAR = 9.8 dB @ 0.01% Probability on CCDF

Power Gain	$G_{ps}$	21	22.7	25	dB
Drain Efficiency	$\eta_D$	30.5	32	—	%
Adjacent Channel Power Ratio	ACPR	—	-47	-45	dBc
Input Return Loss	IRL	—	-20 -20	-9 -7	dB

1. MTTF calculator available at <http://www.freescale.com/rf>. Select Software & Tools/Development Tools/Calculators to access MTTF calculators by product.
2. Refer to AN1955, *Thermal Measurement Methodology of RF Power Amplifiers*. Go to <http://www.freescale.com/rf>. Select Documentation/Application Notes - AN1955.

(continued)

**MRF6S9045NR1 MRF6S9045NBR1**RF Device Data  
Freescale Semiconductor

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

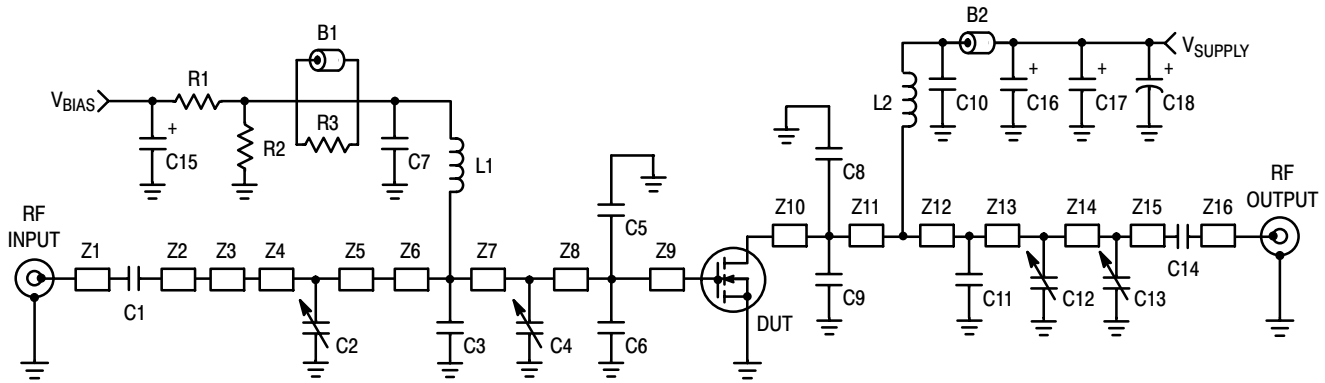
Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

**Typical GSM EDGE Performances** (In Freescale GSM EDGE Test Fixture Optimized for 921-960 MHz, 50 ohm system)  
 $V_{DD} = 28\text{ Vdc}$ ,  $I_{DQ} = 350\text{ mA}$ ,  $P_{out} = 16\text{ W Avg.}$ ,  $f = 921\text{ -}960\text{ MHz}$ , GSM EDGE Signal

Power Gain	$G_{ps}$	—	20	—	dB
Drain Efficiency	$\eta_D$	—	46	—	%
Error Vector Magnitude	EVM	—	1.5	—	%
Spectral Regrowth at 400 kHz Offset	SR1	—	-62	—	dBc
Spectral Regrowth at 600 kHz Offset	SR2	—	-78	—	dBc

**Typical CW Performances** (In Freescale GSM Test Fixture Optimized for 921-960 MHz, 50 ohm system)  $V_{DD} = 28\text{ Vdc}$ ,  
 $I_{DQ} = 350\text{ mA}$ ,  $P_{out} = 45\text{ W}$ ,  $f = 921\text{ -}960\text{ MHz}$

Power Gain	$G_{ps}$	—	20	—	dB
Drain Efficiency	$\eta_D$	—	68	—	%
Input Return Loss	IRL	—	-12	—	dB
$P_{out}$ @ 1 dB Compression Point ( $f = 940\text{ MHz}$ )	P1dB	—	52	—	W



Z1	0.215" x 0.065" Microstrip	Z10	0.360" x 0.270" Microstrip
Z2	0.221" x 0.065" Microstrip	Z11	0.063" x 0.270" Microstrip
Z3	0.500" x 0.100" Microstrip	Z12	0.360" x 0.065" Microstrip
Z4	0.460" x 0.270" Microstrip	Z13	0.095" x 0.065" Microstrip
Z5	0.040" x 0.270" Microstrip	Z14	0.800" x 0.065" Microstrip
Z6	0.280" x 0.270" x 0.530" Taper	Z15	0.260" x 0.065" Microstrip
Z7	0.087" x 0.525" Microstrip	Z16	0.325" x 0.065" Microstrip
Z8	0.435" x 0.525" Microstrip	PCB	Taconic RF-35 0.030", $\epsilon_r = 3.5$
Z9	0.057" x 0.525" Microstrip		

**Figure 1. MRF6S9045NR1(NBR1) Test Circuit Schematic**

**Table 6. MRF6S9045NR1(NBR1) Test Circuit Component Designations and Values**

Part	Description	Part Number	Manufacturer
B1	Ferrite Bead	2743019447	Fair Rite
B2	Ferrite Bead	2743021447	Fair Rite
C1, C7, C10, C14	47 pF Chip Capacitors	ATC100B470JT500XT	ATC
C2, C4, C12	0.8 - 8.0 pF Variable Capacitors, Gigatrim	27291SL	Johanson
C3	15 pF Chip Capacitor	ATC100B150JT500XT	ATC
C5, C6	12 pF Chip Capacitors	ATC100B120JT500XT	ATC
C8, C9	13 pF Chip Capacitors	ATC100B130JT500XT	ATC
C11	7.5 pF Chip Capacitor	ATC100B7R5JT500XT	ATC
C13	0.6 - 4.5 pF Variable Capacitor, Gigatrim	27271SL	Johanson
C15, C16, C17	10 $\mu$ F, 35 V Tantalum Capacitors	T491D106K035AT	Kemet
C18	220 $\mu$ F, 50 V Electrolytic Capacitor	EMVY500ADA221MJA0G	Nippon Chemi-Con
L1, L2	12.5 nH Inductor	A04T-5	Coilcraft
R1	1 k $\Omega$ , 1/4 W Chip Resistor	CRCW12061001FKEA	Vishay
R2	560 k $\Omega$ , 1/4 W Chip Resistor	CRCW12065600FKEA	Vishay
R3	12 $\Omega$ , 1/4 W Chip Resistor	CRCW120612R0FKEA	Vishay

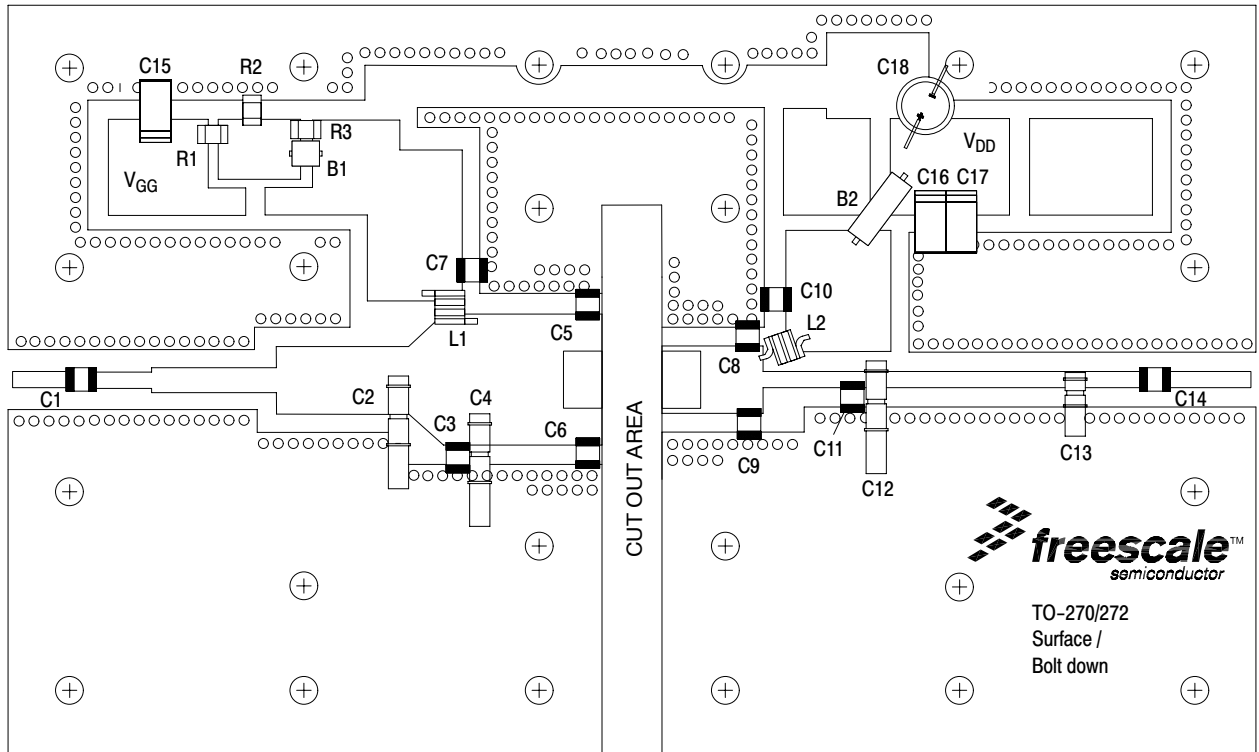


Figure 2. MRF6S9045NR1 (NBR1) Test Circuit Component Layout

### TYPICAL CHARACTERISTICS

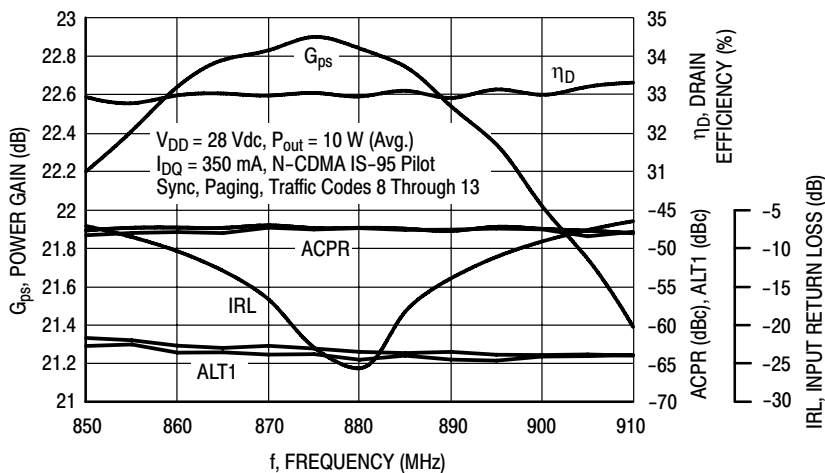


Figure 3. Single-Carrier N-CDMA Broadband Performance @  $P_{out} = 10$  Watts Avg.

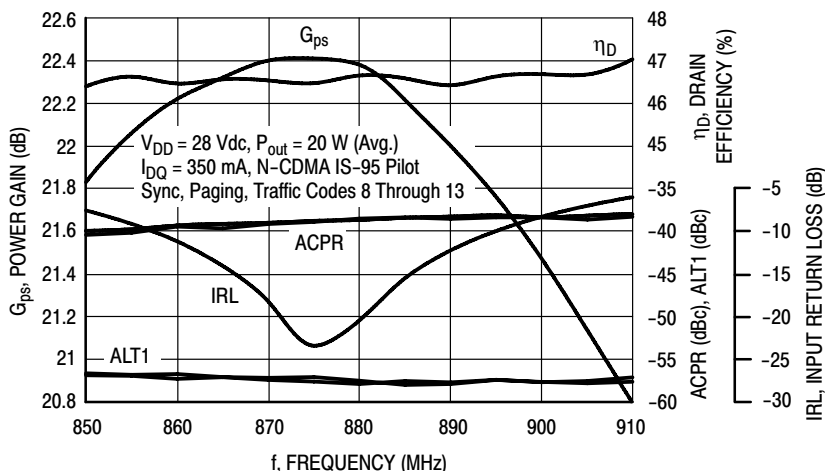


Figure 4. Single-Carrier N-CDMA Broadband Performance @  $P_{out} = 20$  Watts Avg.

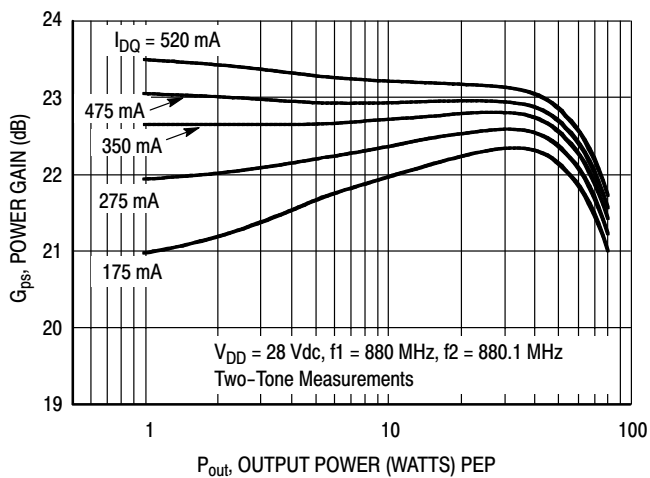


Figure 5. Two-Tone Power Gain versus Output Power

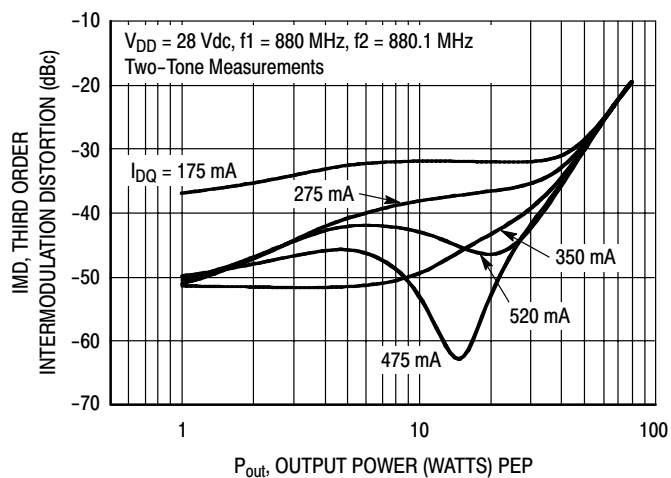
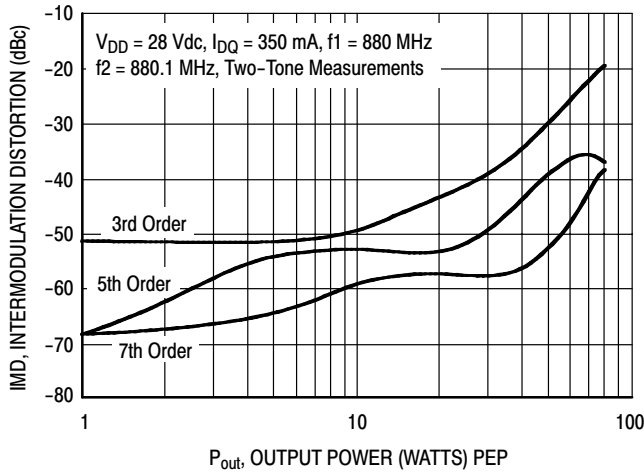
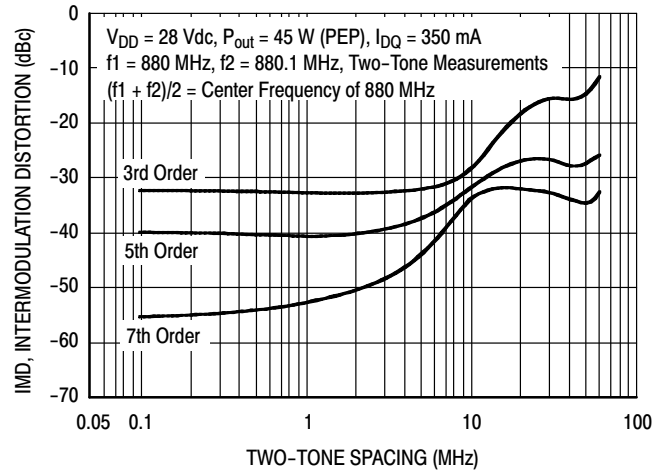


Figure 6. Third Order Intermodulation Distortion versus Output Power

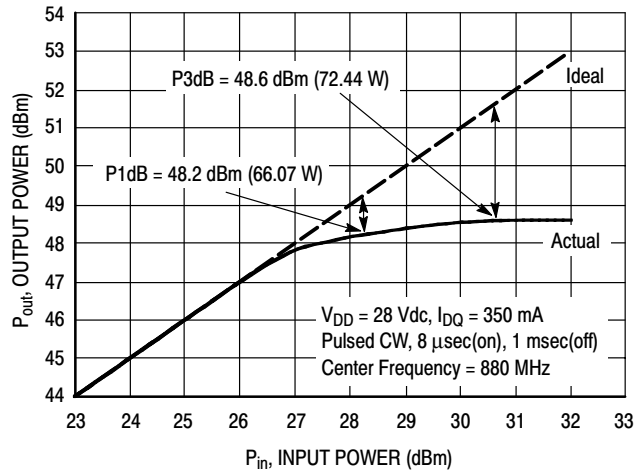
## TYPICAL CHARACTERISTICS



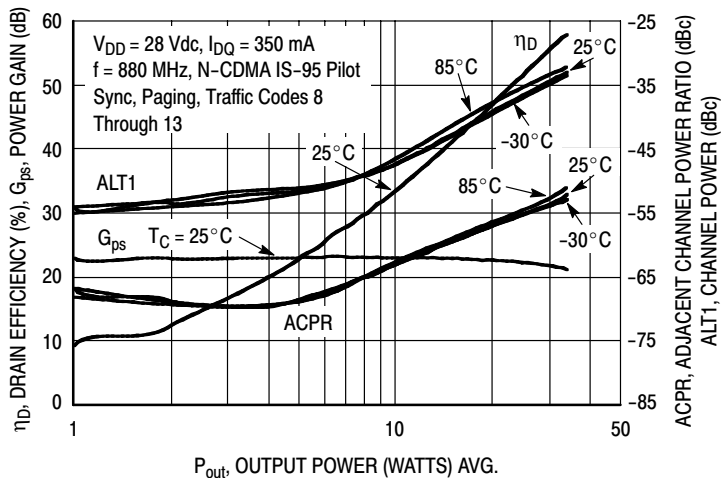
**Figure 7. Intermodulation Distortion Products versus Output Power**



**Figure 8. Intermodulation Distortion Products versus Tone Spacing**



**Figure 9. Pulsed CW Output Power versus Input Power**

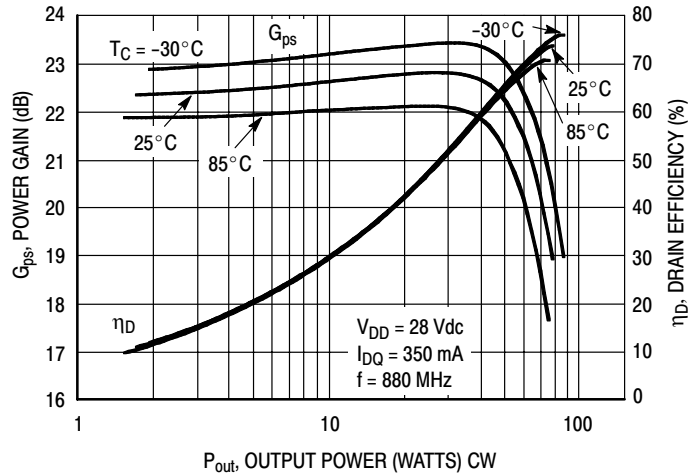


**Figure 10. Single-Carrier N-CDMA ACPR, ALT1, Power Gain and Drain Efficiency versus Output Power**

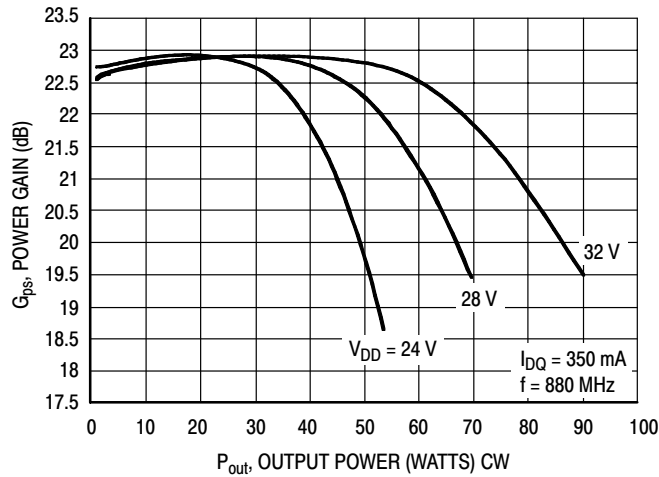
ARCHIVE INFORMATION

ARCHIVE INFORMATION

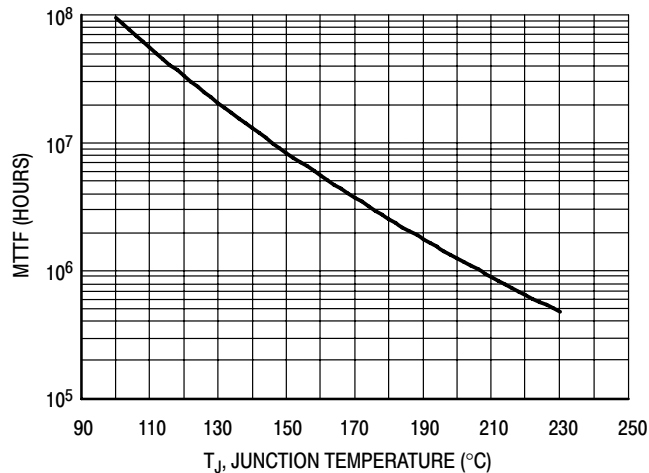
**TYPICAL CHARACTERISTICS**



**Figure 11. Power Gain and Drain Efficiency versus CW Output Power**



**Figure 12. Power Gain versus Output Power**



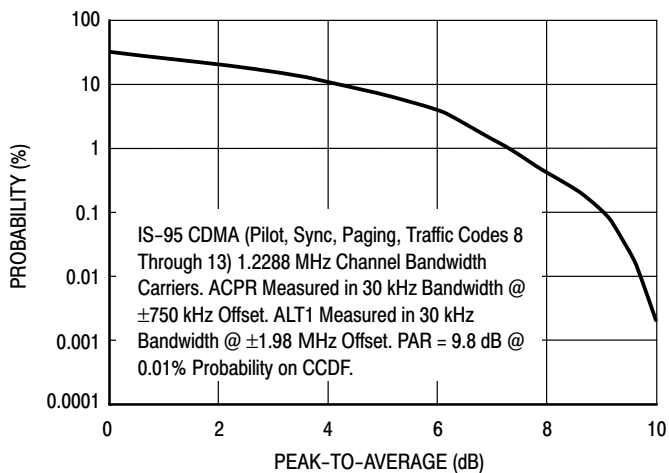
This above graph displays calculated MTTF in hours when the device is operated at V<sub>DD</sub> = 28 Vdc, P<sub>out</sub> = 10 W Avg., and η<sub>D</sub> = 32%.

MTTF calculator available at <http://www.freescale.com/rf>. Select Software & Tools/Development Tools/Calculators to access MTTF calculators by product.

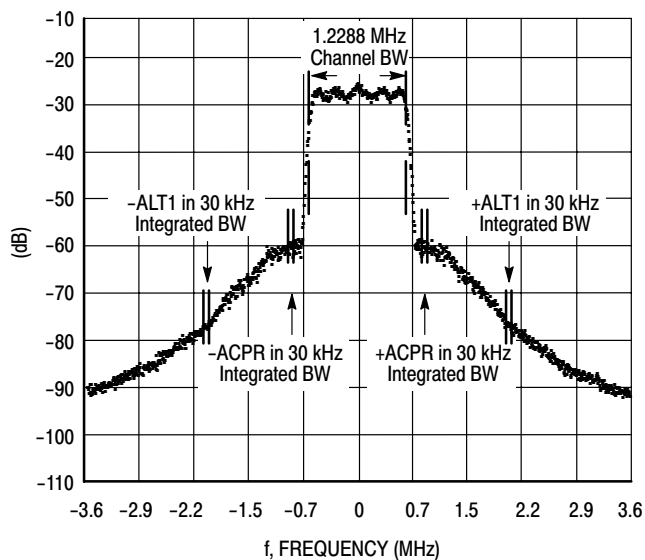
**Figure 13. MTTF Factor versus Junction Temperature**



## N-CDMA TEST SIGNAL



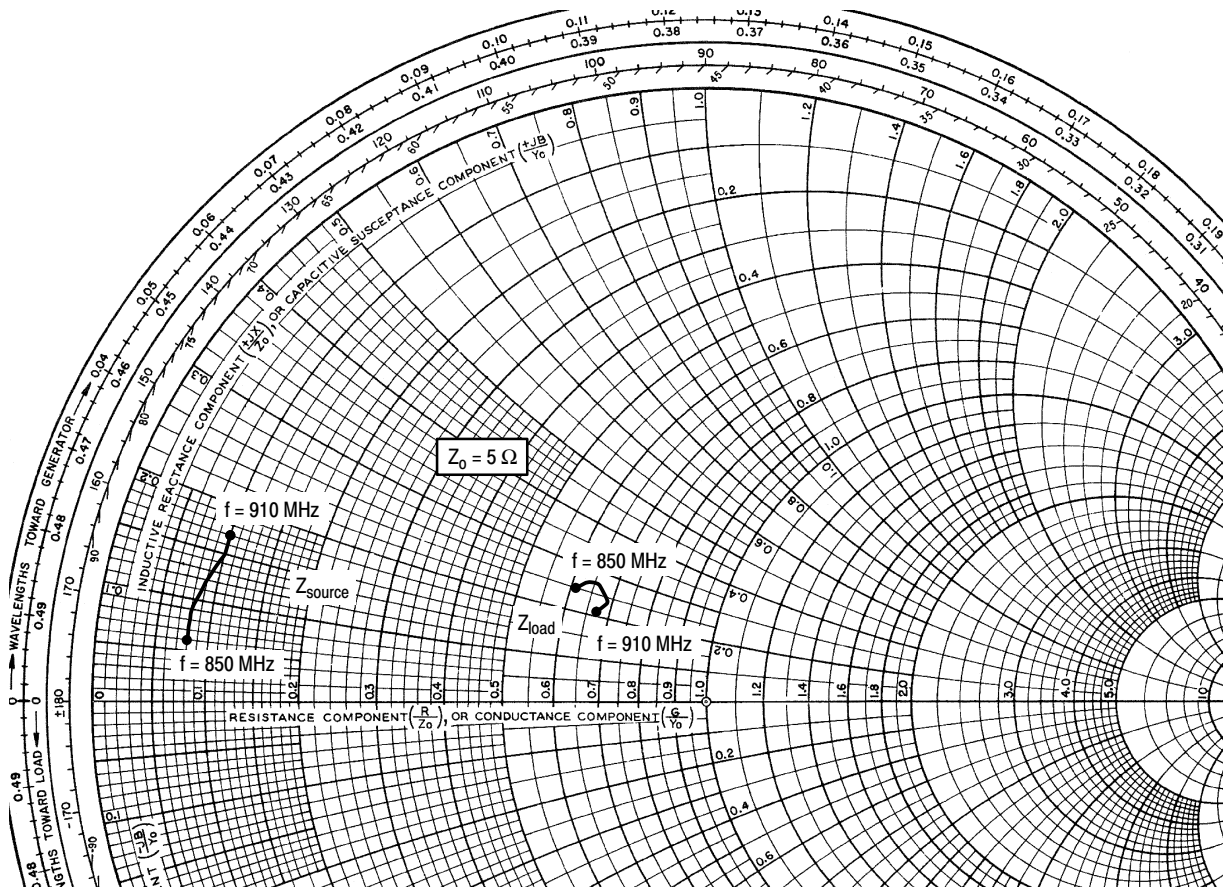
**Figure 14. Single-Carrier CCDF N-CDMA**



**Figure 15. Single-Carrier N-CDMA Spectrum**

ARCHIVE INFORMATION

ARCHIVE INFORMATION



$V_{DD} = 28 \text{ Vdc}$ ,  $I_{DQ} = 350 \text{ mA}$ ,  $P_{out} = 10 \text{ W Avg.}$

f MHz	$Z_{source}$ $\Omega$	$Z_{load}$ $\Omega$
850	$0.42 + j0.30$	$3.05 + j1.27$
865	$0.42 + j0.44$	$3.16 + j1.33$
880	$0.45 + j0.60$	$3.31 + j1.33$
895	$0.48 + j0.74$	$3.43 + j1.20$
910	$0.50 + j0.85$	$3.35 + j1.05$

$Z_{source}$  = Test circuit impedance as measured from gate to ground.

$Z_{load}$  = Test circuit impedance as measured from drain to ground.

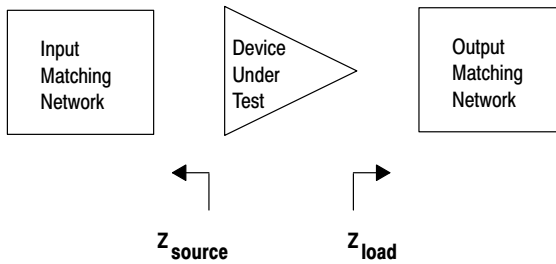
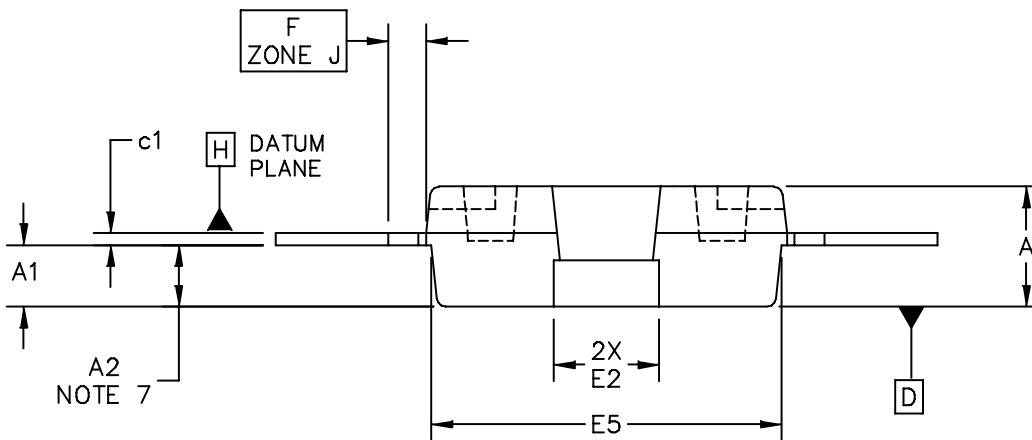
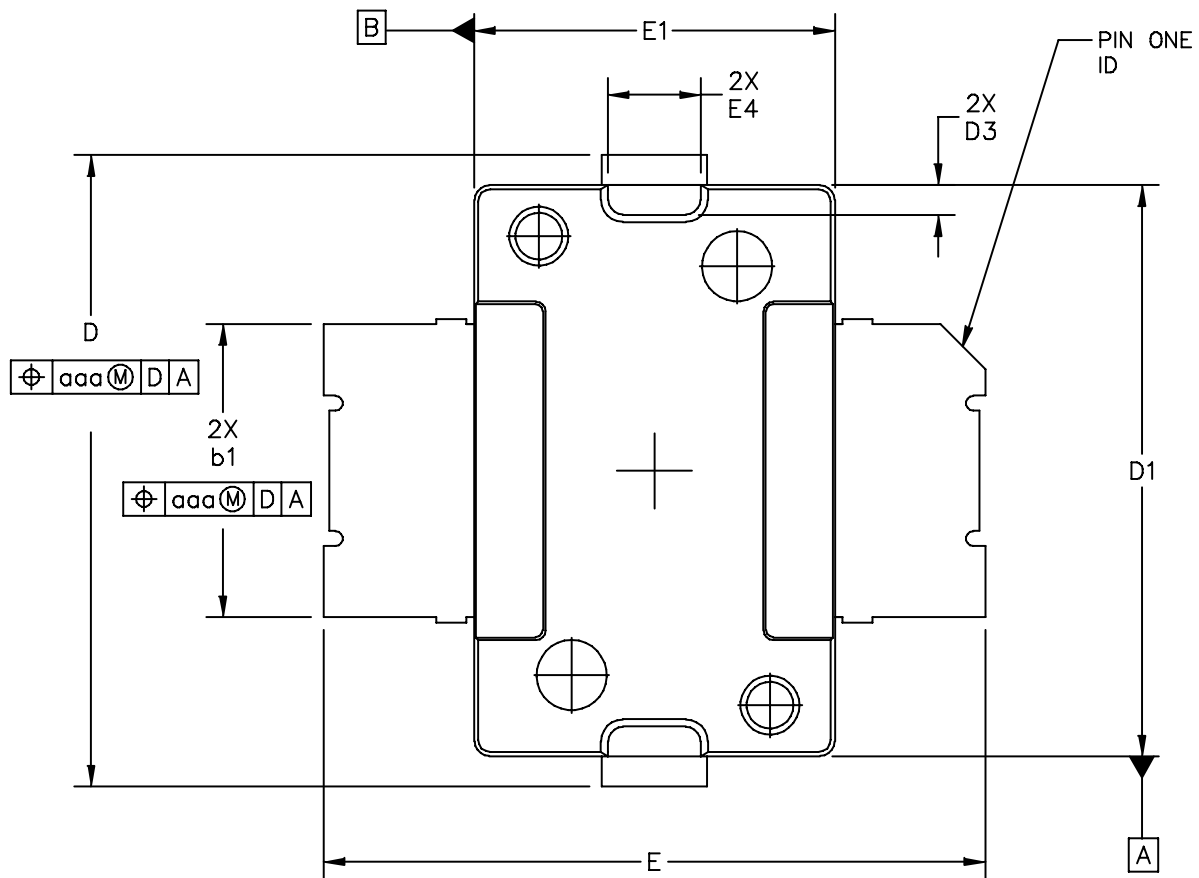


Figure 16. Series Equivalent Source and Load Impedance

PACKAGE DIMENSIONS

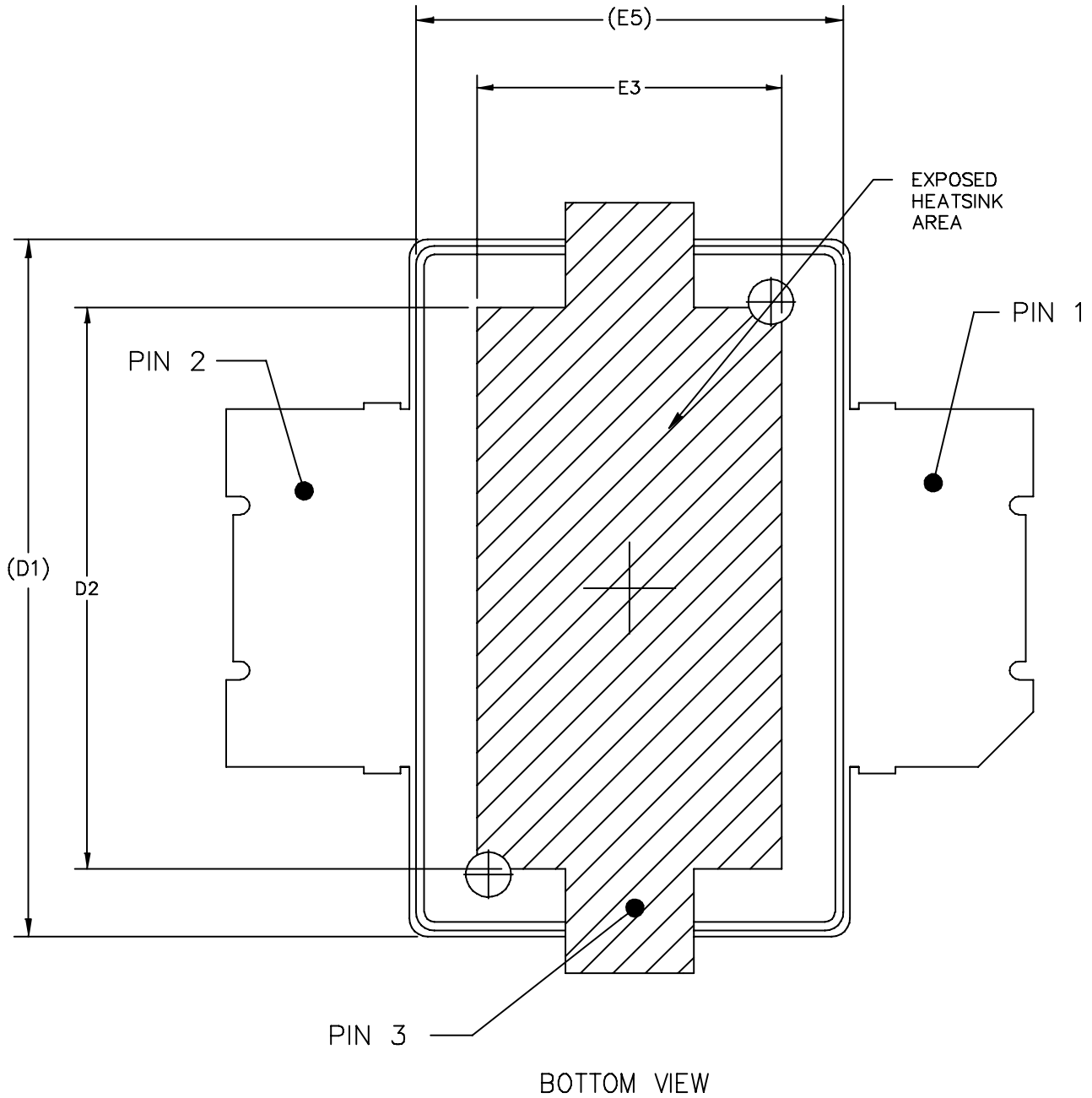


ARCHIVE INFORMATION

ARCHIVE INFORMATION

© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.		MECHANICAL OUTLINE		PRINT VERSION NOT TO SCALE	
TITLE: TO-270 SURFACE MOUNT		DOCUMENT NO: 98ASH98117A		REV: K	
		CASE NUMBER: 1265-09		29 JUN 2007	
		STANDARD: JEDEC TO-270 AA			

MRF6S9045NR1 MRF6S9045NBR1



© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.		MECHANICAL OUTLINE		PRINT VERSION NOT TO SCALE	
TITLE: TO-270 SURFACE MOUNT		DOCUMENT NO: 98ASH98117A		REV: K	
		CASE NUMBER: 1265-09		29 JUN 2007	
		STANDARD: JEDEC TO-270 AA			

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 "D1" AND "E1" DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE PROTRUSION IS .006 PER SIDE. DIMENSIONS "D1 AND "E1" DO INCLUDE MOLD MISMATCH AND ARE DETERMINED AT DATUM PLANE -H-.
5. DIMENSION "b1" DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE .005 TOTAL IN EXCESS OF THE "b1" DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. DATUMS -A- AND -B- TO BE DETERMINED AT DATUM PLANE -H-.
7. DIMENSION "A2" APPLIES WITHIN ZONE "J" ONLY.
8. DIMENSIONS "D" AND "E2" DO NOT INCLUDE MOLD PROTRUSION. OVERALL LENGTH INCLUDING MOLD PROTRUSION SHOULD NOT EXCEED 0.430 INCH FOR DIMENSION "D" AND 0.080 INCH FOR DIMENSION "E2". DIMENSIONS "D" AND "E2" DO INCLUDE MOLD MISMATCH AND ARE DETERMINED AT DATUM PLANE -D-.

STYLE 1:

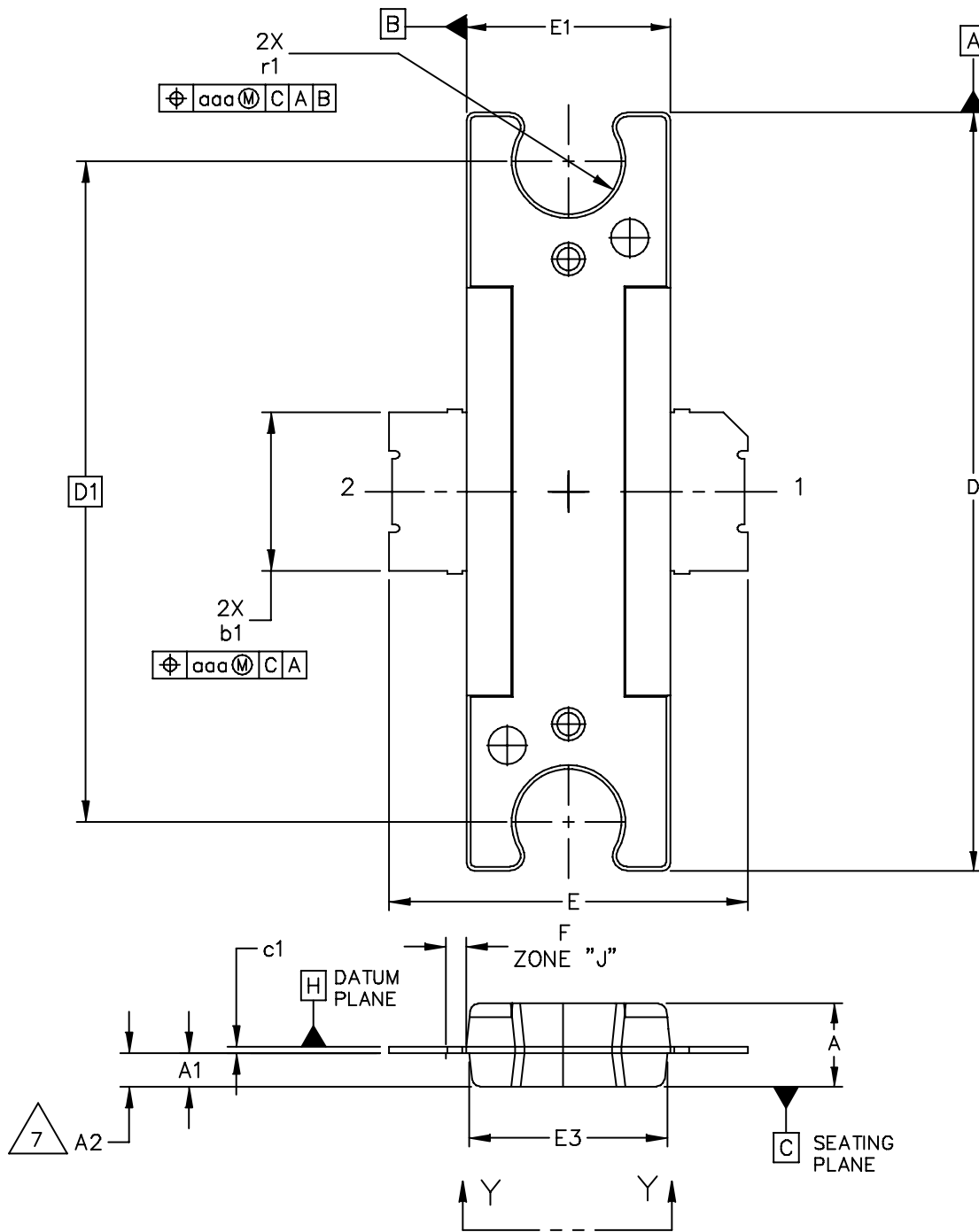
- PIN 1 - DRAIN
- PIN 2 - GATE
- PIN 3 - SOURCE

DIM	INCH		MILLIMETER		DIM	INCH		MILLIMETER	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
A	.078	.082	1.98	2.08	F	.025 BSC		0.64 BSC	
A1	.039	.043	0.99	1.09	b1	.193	.199	4.90	5.06
A2	.040	.042	1.02	1.07	c1	.007	.011	0.18	0.28
D	.416	.424	10.57	10.77	aaa	.004		0.10	
D1	.378	.382	9.60	9.70					
D2	.290	----	7.37	----					
D3	.016	.024	0.41	0.61					
E	.436	.444	11.07	11.28					
E1	.238	.242	6.04	6.15					
E2	.066	.074	1.68	1.88					
E3	.150	----	3.81	----					
E4	.058	.066	1.47	1.68					
E5	.231	.235	5.87	5.97					

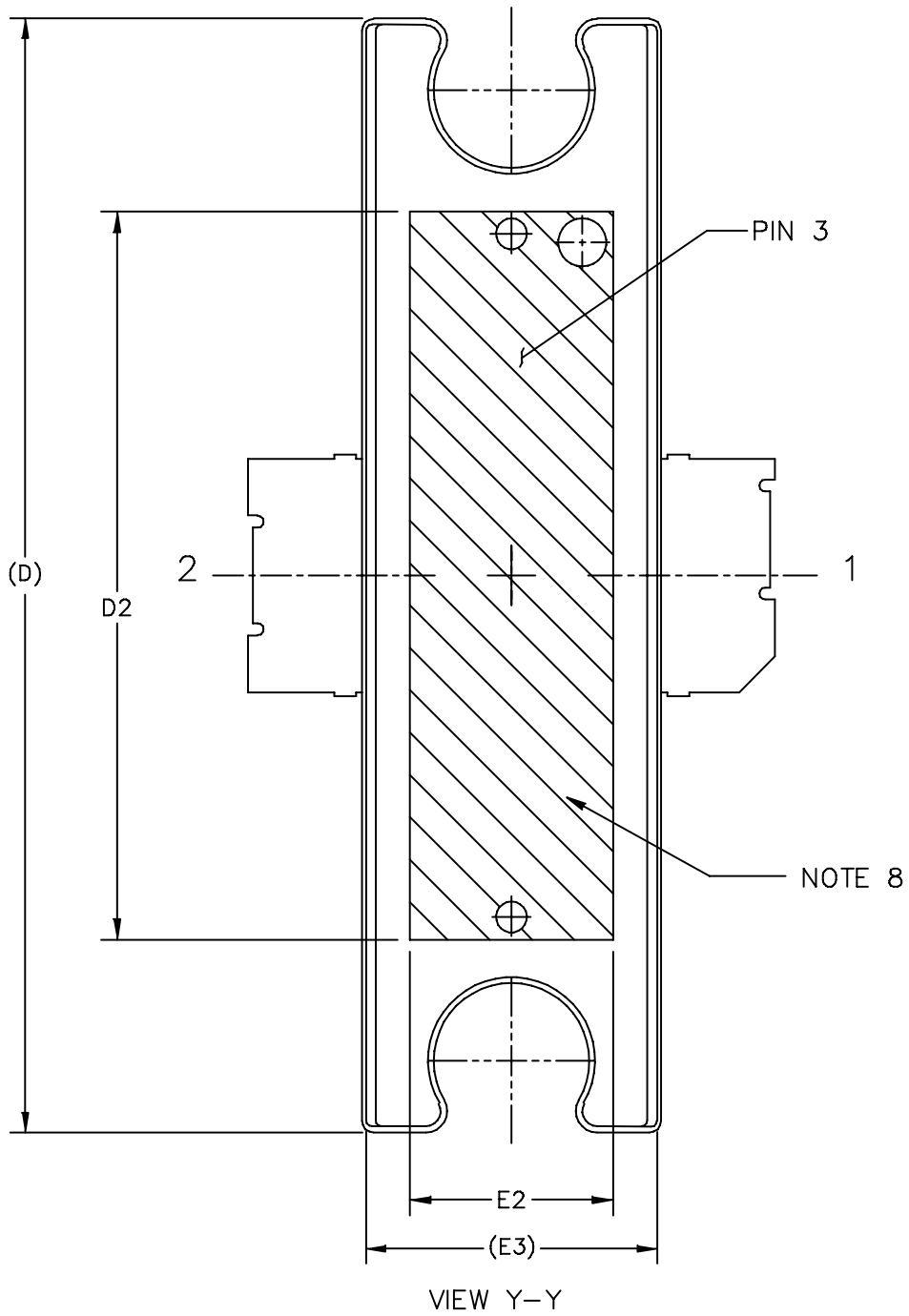
© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.		MECHANICAL OUTLINE		PRINT VERSION NOT TO SCALE	
TITLE:  TO-270 SURFACE MOUNT			DOCUMENT NO: 98ASH98117A		REV: K
			CASE NUMBER: 1265-09		29 JUN 2007
			STANDARD: JEDEC TO-270 AA		

ARCHIVE INFORMATION

ARCHIVE INFORMATION



© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.		MECHANICAL OUTLINE		PRINT VERSION NOT TO SCALE	
TITLE: TO-272 2 LEAD		DOCUMENT NO: 98ASA99191D		REV: E	
		CASE NUMBER: 1337-04		10 SEP 2007	
		STANDARD: JEDEC TO-272 BC			



© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.		MECHANICAL OUTLINE		PRINT VERSION NOT TO SCALE	
TITLE:  TO-272 2 LEAD	DOCUMENT NO: 98ASA99191D			REV: E	
	CASE NUMBER: 1337-04			10 SEP 2007	
	STANDARD: JEDEC TO-272 BC				

NOTES:

1. CONTROLLING DIMENSION: INCH
2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
3. DATUM PLANE -H- IS LOCATED AT THE 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 "D" AND "E1" DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE PROTRUSION IS .006 PER SIDE. DIMENSIONS "D" AND "E1" DO INCLUDE MOLD MISMATCH AND ARE DETERMINED AT DATUM PLANE -H-.
5. DIMENSIONS "b1" DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE .005 TOTAL IN EXCESS OF THE "b1" DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. DATUMS -A- AND -B- TO BE DETERMINED AT DATUM PLANE -H-.
7. DIMENSION A2 APPLIES WITHIN ZONE "J" ONLY.
8. HATCHING REPRESENTS THE EXPOSED AREA OF THE HEAT SLUG.

STYLE 1:  
 PIN 1 - DRAIN  
 PIN 2 - GATE  
 PIN 3 - SOURCE

DIM	INCH		MILLIMETER		DIM	INCH		MILLIMETER	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
A	.100	.104	2.54	2.64	b1	.193	.199	4.90	5.05
A1	.039	.043	0.99	1.09	c1	.007	.011	0.18	0.28
A2	.040	.042	1.02	1.07	r1	.063	.068	1.60	1.73
D	.928	.932	23.57	23.67	aaa	.004		0.1	
D1	.810 BSC		20.57 BSC						
D2	.604	----	15.34	----					
E	.438	.442	11.12	11.23					
E1	.248	.252	6.30	6.40					
E2	.162	----	4.11	----					
E3	.241	.245	6.12	6.22					
F	.025 BSC		0.64 BSC						
© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.			MECHANICAL OUTLINE			PRINT VERSION NOT TO SCALE			
TITLE:  TO-272 2 LEAD					DOCUMENT NO: 98ASA99191D			REV: E	
					CASE NUMBER: 1337-04			10 SEP 2007	
					STANDARD: JEDEC TO-272 BS				



## PRODUCT DOCUMENTATION

Refer to the following documents to aid your design process.

### Application Notes

- AN1907: Solder Reflow Attach Method for High Power RF Devices in Plastic Packages
- AN1955: Thermal Measurement Methodology of RF Power Amplifiers
- AN3263: Bolt Down Mounting Method for High Power RF Transistors and RFICs in Over-Molded Plastic Packages

### Engineering Bulletins

- EB212: Using Data Sheet Impedances for RF LDMOS Devices

## REVISION HISTORY

The following table summarizes revisions to this document.

Revision	Date	Description
4	Aug. 2008	<ul style="list-style-type: none"> <li>• Listed replacement part and Device Migration notification reference number, p. 1</li> <li>• Listed MRF6S9045NBR1 as no longer manufactured, p. 1</li> <li>• Replaced Case Outline 1265-08 with 1265-09, Issue K, p. 1, 11-13. Corrected cross hatch pattern in bottom view and changed its dimensions (D2 and E3) to minimum value on source contact (D2 changed from Min-Max .290-.320 to .290 Min; E3 changed from Min-Max .150-.180 to .150 Min). Added JEDEC Standard Package Number.</li> <li>• Replaced Case Outline 1337-03 with 1337-04, p. 1, 14-16. Issue D: Removed Drain-ID label from View Y-Y on Sheet 2. Renamed E2 to E3. Added cross-hatch region dimensions D2 and E2. Added JEDEC Standard Package Number. Issue E: Corrected document number 98ASA99191D on Sheet 3.</li> <li>• Removed Total Device Dissipation from Max Ratings table as data was redundant (information already provided in Thermal Characteristics table), p. 1</li> <li>• Added Case Operating Temperature limit to the Maximum Ratings table and set limit to 150°C, p. 1</li> <li>• Operating Junction Temperature increased from 200°C to 225°C in Maximum Ratings table, related "Continuous use at maximum temperature will affect MTTF" footnote added and changed 200°C to 225°C in Capable Plastic Package bullet, p. 1</li> <li>• Corrected <math>V_{DS}</math> to <math>V_{DD}</math> in the RF test condition voltage callout for <math>V_{GS(Q)}</math> and added "Measured in Functional Test", On Characteristics table, p. 2</li> <li>• Removed Forward Transconductance from On Characteristics table as it no longer provided usable information, p. 2</li> <li>• Corrected <math>C_{ISS}</math> test condition to indicate AC stimulus on the <math>V_{GS}</math> connection versus the <math>V_{DS}</math> connection, Dynamic Characteristics table, p. 2</li> <li>• Updated Part Numbers in Table 6 Component Designations and Values, to latest RoHS compliant part numbers, p. 4</li> <li>• Adjusted scale for Fig. 5, Two-Tone Power Gain versus Output Power, to better match the device's capabilities, p. 6</li> <li>• Removed lower voltage tests from Fig. 12, Power Gain versus Output Power, due to fixed tuned fixture limitations, p. 8</li> <li>• Replaced Fig. 13, MTTF versus Junction Temperature with updated graph. Removed Amps<sup>2</sup> and listed operating characteristics and location of MTTF calculator for device, p. 8</li> <li>• Added Product Documentation and Revision History, p. 17</li> </ul>

ARCHIVE INFORMATION

ARCHIVE INFORMATION

## How to Reach Us:

### Home Page:

[www.freescale.com](http://www.freescale.com)

### Web Support:

<http://www.freescale.com/support>

### USA/Europe or Locations Not Listed:

Freescale Semiconductor, Inc.  
Technical Information Center, EL516  
2100 East Elliot Road  
Tempe, Arizona 85284  
1-800-521-6274 or +1-480-768-2130  
[www.freescale.com/support](http://www.freescale.com/support)

### Europe, Middle East, and Africa:

Freescale Halbleiter Deutschland GmbH  
Technical Information Center  
Schatzbogen 7  
81829 Muenchen, Germany  
+44 1296 380 456 (English)  
+46 8 52200080 (English)  
+49 89 92103 559 (German)  
+33 1 69 35 48 48 (French)  
[www.freescale.com/support](http://www.freescale.com/support)

### Japan:

Freescale Semiconductor Japan Ltd.  
Headquarters  
ARCO Tower 15F  
1-8-1, Shimo-Meguro, Meguro-ku,  
Tokyo 153-0064  
Japan  
0120 191014 or +81 3 5437 9125  
[support.japan@freescale.com](mailto:support.japan@freescale.com)

### Asia/Pacific:

Freescale Semiconductor China Ltd.  
Exchange Building 23F  
No. 118 Jianguo Road  
Chaoyang District  
Beijing 100022  
China  
+86 10 5879 8000  
[support.asia@freescale.com](mailto:support.asia@freescale.com)

### For Literature Requests Only:

Freescale Semiconductor Literature Distribution Center  
P.O. Box 5405  
Denver, Colorado 80217  
1-800-441-2447 or +1-303-675-2140  
Fax: +1-303-675-2150  
[LDCForFreescaleSemiconductor@hibbertgroup.com](mailto:LDCForFreescaleSemiconductor@hibbertgroup.com)

Information in this document is provided solely to enable system and software implementers to use Freescale Semiconductor products. There are no express or implied copyright licenses granted hereunder to design or fabricate any integrated circuits or integrated circuits based on the information in this document.

Freescale Semiconductor reserves the right to make changes without further notice to any products herein. Freescale Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Freescale Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters that may be provided in Freescale Semiconductor data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals", must be validated for each customer application by customer's technical experts. Freescale Semiconductor does not convey any license under its patent rights nor the rights of others. Freescale Semiconductor products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Freescale Semiconductor product could create a situation where personal injury or death may occur. Should Buyer purchase or use Freescale Semiconductor products for any such unintended or unauthorized application, Buyer shall indemnify and hold Freescale Semiconductor and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Freescale Semiconductor was negligent regarding the design or manufacture of the part.

Freescale™ and the Freescale logo are trademarks of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners.  
© Freescale Semiconductor, Inc. 2005-2006, 2008. All rights reserved.

RoHS-compliant and/or Pb-free versions of Freescale products have the functionality and electrical characteristics of their non-RoHS-compliant and/or non-Pb-free counterparts. For further information, see <http://www.freescale.com> or contact your Freescale sales representative.

For information on Freescale's Environmental Products program, go to <http://www.freescale.com/epp>.

