



RF Power LDMOS Transistors

N-Channel Enhancement-Mode Lateral MOSFETs

These 9 watt asymmetrical Doherty RF power LDMOS transistors are designed for cellular base station applications requiring very wide instantaneous bandwidth capability covering the frequency range of 2496 to 2690 MHz.

- Typical Doherty Single-Carrier W-CDMA Performance: $V_{DD} = 28$ Volts, $I_{DQA} = 100$ mA, $V_{GSB} = 1.4$ Vdc, $P_{out} = 9$ Watts Avg., Input Signal PAR = 9.9 dB @ 0.01% Probability on CCDF.

Frequency	G_{ps} (dB)	η_D (%)	Output PAR (dB)	ACPR (dBc)
2620 MHz	14.9	48.6	7.9	-28.4
2655 MHz	14.6	48.3	7.9	-32.6
2690 MHz	14.2	47.1	7.8	-37.3

Features

- Advanced High Performance In-Package Doherty
- Designed for Wide Instantaneous Bandwidth Applications
- Greater Negative Gate-Source Voltage Range for Improved Class C Operation
- Designed for Digital Predistortion Error Correction Systems
- In Tape and Reel. R3 Suffix = 250 Units, 44 mm Tape Width, 13-inch Reel.

AFT26HW050SR3
AFT26HW050GSR3
AFT26H050W26SR3

2496–2690 MHz, 9 W AVG., 28 V

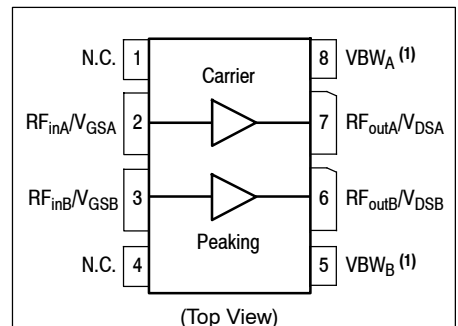
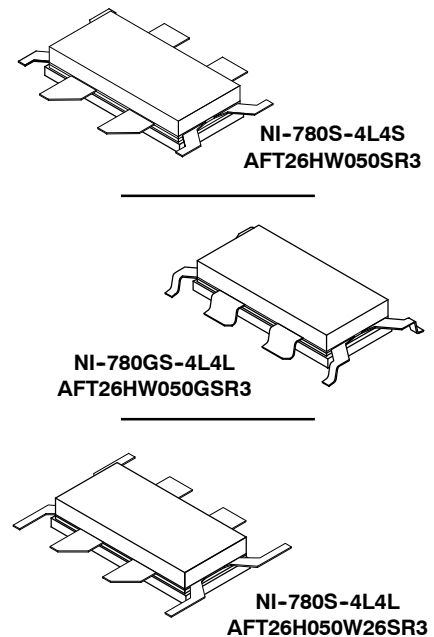


Figure 1. Pin Connections

1. Device can operate with the V_{DD} current supplied through pin 5 and pin 8.

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-0.5, +65	Vdc
Gate-Source Voltage	V_{GS}	-6.0, +10	Vdc
Operating Voltage	V_{DD}	32, +0	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

Table 2. Thermal Characteristics

Characteristic	Symbol	Value ^(2,3)	Unit
Thermal Resistance, Junction to Case Case Temperature 72°C, 9 W W-CDMA, 28 Vdc, $I_{DQA} = 100$ mA, $V_{GSB} = 2.8$ Vdc, 2655 MHz	$R_{\theta JC}$	0.75	°C/W

Table 3. ESD Protection Characteristics

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

Table 4. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

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

Off Characteristics ⁽⁴⁾

Zero Gate Voltage Drain Leakage Current ($V_{DS} = 65$ Vdc, $V_{GS} = 0$ Vdc)	I_{DSS}	—	—	10	μAdc
Zero Gate Voltage Drain Leakage Current ($V_{DS} = 28$ Vdc, $V_{GS} = 0$ Vdc)	I_{DSS}	—	—	1	μAdc
Gate-Source Leakage Current ($V_{GS} = 5$ Vdc, $V_{DS} = 0$ Vdc)	I_{GSS}	—	—	1	μAdc

On Characteristics - Side A ⁽⁴⁾

Gate Threshold Voltage ($V_{DS} = 10$ Vdc, $I_D = 18$ μAdc)	$V_{GS(th)}$	1.5	2.1	2.5	Vdc
Gate Quiescent Voltage ($V_{DS} = 28$ Vdc, $I_{DA} = 100$ mA)	$V_{GSA(Q)}$	—	2.85	—	Vdc
Gate Quiescent Voltage ⁽⁵⁾ ($V_{DD} = 28$ Vdc, $I_{DA} = 100$ mA, Measured in Functional Test)	$V_{GGA(Q)}$	5.0	5.7	6.0	Vdc
Drain-Source On-Voltage ($V_{GS} = 10$ Vdc, $I_D = 0.18$ Adc)	$V_{DS(on)}$	0.1	0.21	0.3	Vdc

On Characteristics - Side B ⁽⁴⁾

Gate Threshold Voltage ($V_{DS} = 10$ Vdc, $I_D = 36$ μAdc)	$V_{GS(th)}$	1.5	2.0	2.5	Vdc
Gate Quiescent Voltage ($V_{DS} = 28$ Vdc)	$V_{GSB(Q)}$	—	1.4	—	Vdc
Gate Quiescent Voltage ⁽⁵⁾ ($V_{DD} = 28$ Vdc, Measured in Functional Test)	$V_{GGB(Q)}$	—	2.8	—	Vdc
Drain-Source On-Voltage ($V_{GS} = 10$ Vdc, $I_D = 0.36$ Adc)	$V_{DS(on)}$	0.1	0.22	0.3	Vdc

1. Continuous use at maximum temperature will affect MTTF.

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

3. Refer to AN1955, *Thermal Measurement Methodology of RF Power Amplifiers*. Go to <http://www.freescale.com/rf>. Select Documentation/Application Notes - AN1955.

4. Each side of device measured separately.

5. $V_{GG} = 2 \times V_{GS(Q)}$. Parameter measured on Freescale test fixture, due to resistor divider network on the board. Refer to test fixture layout.

(continued)

AFT26HW050SR3 AFT26HW050GSR3 AFT26H050W26SR3

Table 4. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted) (continued)

Characteristic	Symbol	Min	Typ	Max	Unit
Functional Tests ^(1,2,3) (In Freescale Doherty Test Fixture, 50 ohm system) $V_{DD} = 28\text{ Vdc}$, $I_{DQA} = 100\text{ mA}$, $V_{GSB} = 1.4\text{ Vdc}$, $P_{out} = 9\text{ W Avg.}$, $f = 2690\text{ MHz}$, Single-Carrier W-CDMA, IQ Magnitude Clipping, Input Signal PAR = 9.9 dB @ 0.01% Probability on CCDF. ACPR measured in 3.84 MHz Channel Bandwidth @ $\pm 5\text{ MHz}$ Offset.					
Power Gain	G_{ps}	13.5	14.2	16.5	dB
Drain Efficiency	η_D	44.0	47.1	—	%
Output Peak-to-Average Ratio @ 0.01% Probability on CCDF	PAR	7.3	7.8	—	dB
Adjacent Channel Power Ratio	ACPR	—	-37.3	-32.5	dBc

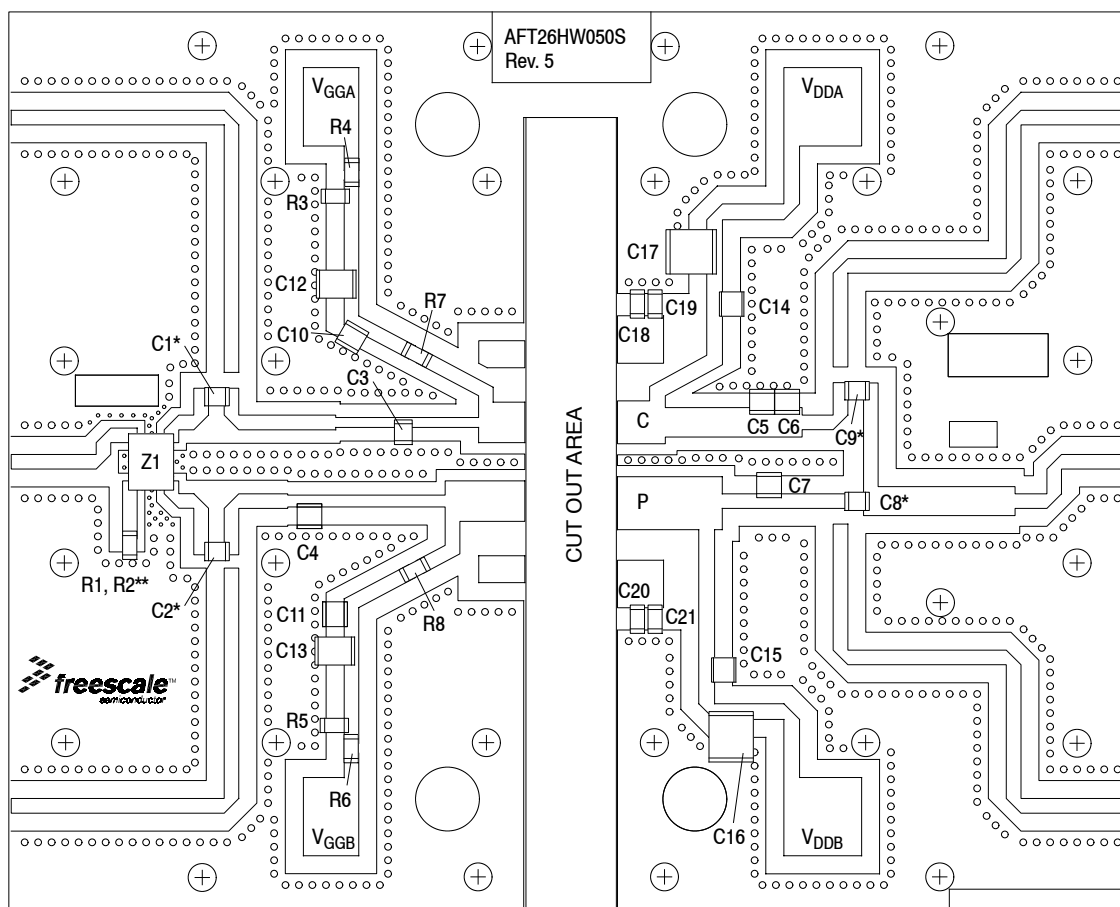
Load Mismatch (In Freescale Test Fixture, 50 ohm system) $I_{DQA} = 100\text{ mA}$, $f = 2655\text{ MHz}$

VSWR 10:1 at 32 Vdc, 35 W CW Output Power (3 dB Input Overdrive from 70 W CW Rated Power)	No Device Degradation
--	-----------------------

Typical Performances ⁽²⁾ (In Freescale Doherty Test Fixture, 50 ohm system) $V_{DD} = 28\text{ Vdc}$, $I_{DQA} = 100\text{ mA}$, $V_{GSB} = 1.4\text{ Vdc}$, 2620–2690 MHz Bandwidth

P_{out} @ 1 dB Compression Point, CW	P1dB	—	42	—	W
P_{out} @ 3 dB Compression Point ⁽⁴⁾	P3dB	—	54	—	W
AM/PM (Maximum value measured at the P3dB compression point across the 2620–2690 MHz frequency range)	Φ	—	35	—	°
VBW Resonance Point ⁽⁵⁾ (IMD Third Order Intermodulation Inflection Point)	VBW_{res}	—	130	—	MHz
Gain Flatness in 70 MHz Bandwidth @ $P_{out} = 9\text{ W Avg.}$	G_F	—	0.7	—	dB
Gain Variation over Temperature (-30°C to $+85^\circ\text{C}$)	ΔG	—	0.014	—	dB/°C
Output Power Variation over Temperature (-30°C to $+85^\circ\text{C}$)	$\Delta P1dB$	—	0.007	—	dB/°C

1. Part internally matched both on input and output.
2. Measurements made with device in an asymmetrical Doherty configuration.
3. Measurements made with device in straight lead configuration before any lead forming operation is applied. Lead forming is used for gull wing (GS) parts.
4. $P3dB = P_{avg} + 7.0\text{ dB}$ where P_{avg} is the average output power measured using an unclipped W-CDMA single-carrier input signal where output PAR is compressed to 7.0 dB @ 0.01% probability on CCDF.
5. Measured using gull wing formed part in AFT26HW050GS characterization test fixture. See Appendix, p. 17.



*C1, C2, C8 and C9 are mounted vertically.

**R1 and R2 are stacked.

Figure 2. AFT26HW050SR3 Test Circuit Component Layout

Table 5. AFT26HW050SR3 Test Circuit Component Designations and Values

Part	Description	Part Number	Manufacturer
C1, C2, C8, C9, C10, C11, C14, C15	3.9 pF Chip Capacitors	ATC100B3R9BT500XT	ATC
C3	0.4 pF Chip Capacitor	ATC100B0R4BT500XT	ATC
C4	0.3 pF Chip Capacitor	ATC100B0R3BT500XT	ATC
C5, C6	0.2 pF Chip Capacitors	ATC100B0R2BT500XT	ATC
C7	0.1 pF Chip Capacitor	ATC100B0R1BT500XT	ATC
C12, C13	4.7 μ F Chip Capacitors	C4532X7S2A475M230KB	TDK
C16, C17	10 μ F Chip Capacitors	C5750X7S2A106M230KB	TDK
C18, C19, C20, C21	1.0 μ F Chip Capacitors	12065G105ZAT2A	AVX
R1, R2	100 Ω , 1/4 W Chip Resistors	WCR1206-100RFI	Welwyn
R3, R4, R5, R6	10 k Ω , 1/4 W Chip Resistors	WCR1206-10K0FI	Welwyn
R7, R8	4.7 Ω , 1/4 W Chip Resistors	WCR1206-4R70FI	Welwyn
Z1	2300–2700 MHz Band, 90°, 5 dB Hybrid Coupler	X3C25P1-05S	Anaren
PCB	0.030", $\epsilon_r = 3.5$	RF35A2	Taconic

TYPICAL CHARACTERISTICS

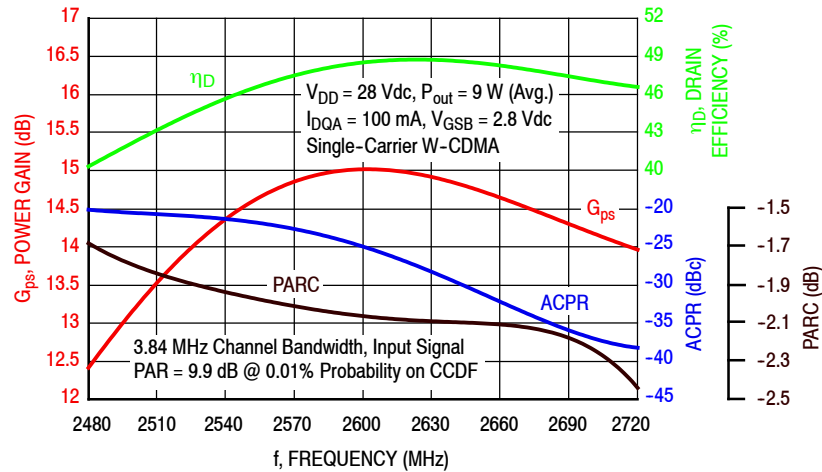
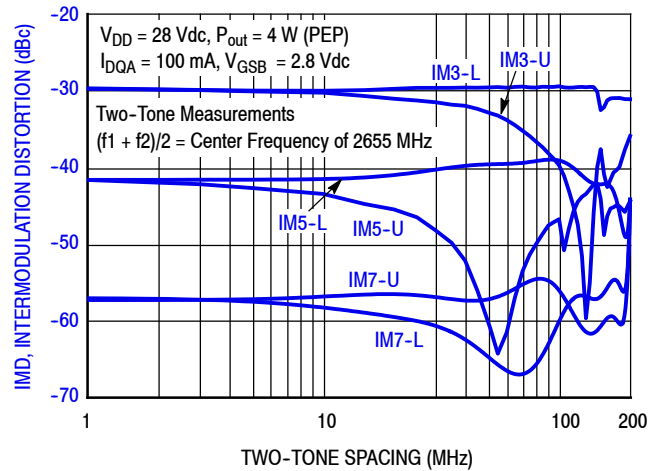


Figure 3. Single-Carrier Output Peak-to-Average Ratio Compression (PARC) Broadband Performance @ $P_{out} = 9$ Watts Avg.



Note: Measured using gull wing formed part in AFT26HW050GS characterization test fixture. See Appendix, p. 17.

Figure 4. Intermodulation Distortion Products versus Two-Tone Spacing

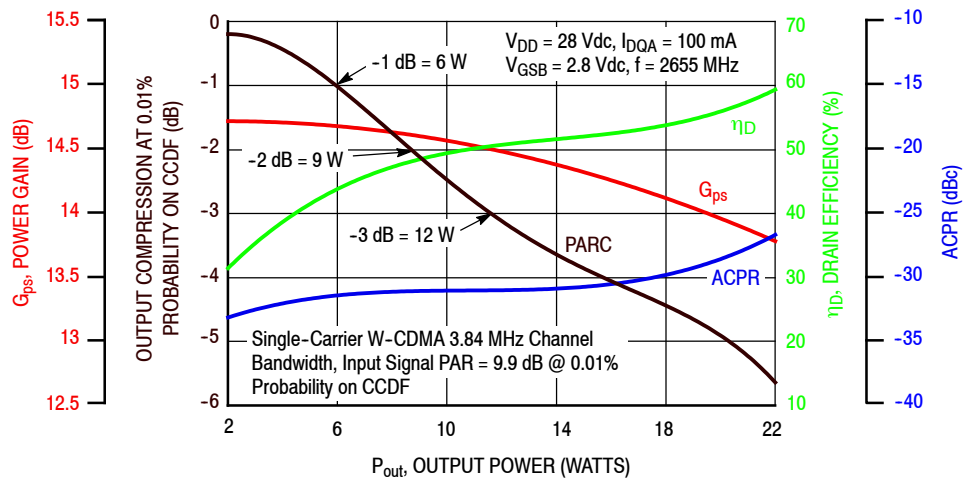


Figure 5. Output Peak-to-Average Ratio Compression (PARC) versus Output Power

TYPICAL CHARACTERISTICS

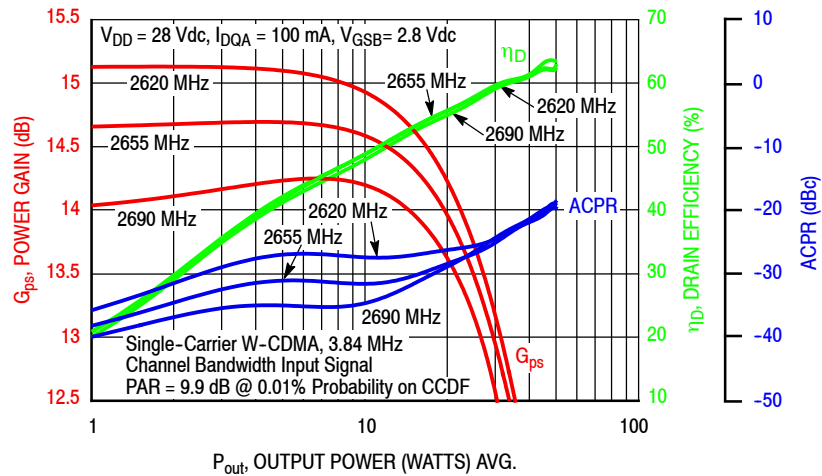


Figure 6. Single-Carrier W-CDMA Power Gain, Drain Efficiency and ACPR versus Output Power

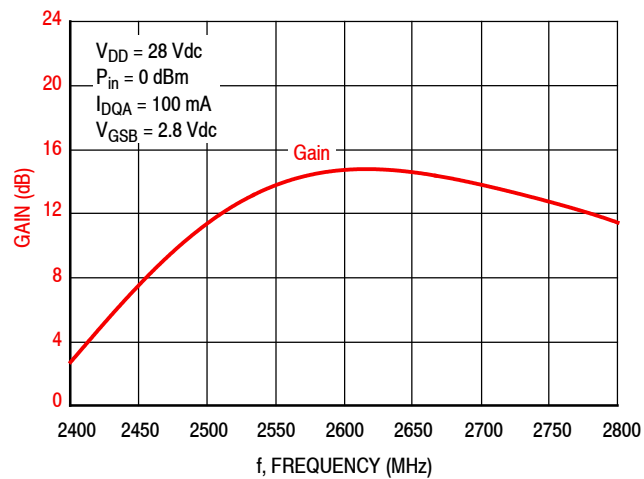


Figure 7. Broadband Frequency Response

$V_{DD} = 28 \text{ Vdc}$, $I_{DQA} = 87 \text{ mA}$, Pulsed CW, 10 $\mu\text{sec}(\text{on})$, 10% Duty Cycle

f (MHz)	Z_{source} (Ω)	Z_{in} (Ω)	Max Output Power					
			P1dB					
			$Z_{\text{load}}^{(1)}$ (Ω)	Gain (dB)	(dBm)	(W)	η_D (%)	AM/PM (°)
2620	28.0 - j23.1	23.9 + j22.9	27.8 - j12.4	17.2	42.9	19	54.9	-17
2655	36.9 - j21.1	33.1 + j21.2	29.1 - j11.6	17.3	42.9	19	56.0	-16
2690	48.4 - j13.5	42.1 + j16.0	30.9 - j14.3	17.0	42.8	19	53.5	-17

f (MHz)	Z_{source} (Ω)	Z_{in} (Ω)	Max Output Power					
			P3dB					
			$Z_{\text{load}}^{(2)}$ (Ω)	Gain (dB)	(dBm)	(W)	η_D (%)	AM/PM (°)
2620	28.0 - j23.1	27.1 + j23.9	29.8 - j16.4	14.8	43.6	23	54.6	-21
2655	36.9 - j21.1	37.9 + j20.4	31.0 - j16.1	14.9	43.6	23	55.1	-21
2690	48.4 - j13.5	47.7 + j12.5	32.1 - j14.9	14.9	43.6	23	54.9	-22

(1) Load impedance for optimum P1dB power.

(2) Load impedance for optimum P3dB power.

Z_{source} = Measured impedance presented to the input of the device at the package reference plane.

Z_{in} = Impedance as measured from gate contact to ground.

Z_{load} = Measured impedance presented to the output of the device at the package reference plane.

Figure 8. Carrier Side Load Pull Performance — Maximum Power Tuning

$V_{DD} = 28 \text{ Vdc}$, $I_{DQA} = 87 \text{ mA}$, Pulsed CW, 10 $\mu\text{sec}(\text{on})$, 10% Duty Cycle

f (MHz)	Z_{source} (Ω)	Z_{in} (Ω)	Max Drain Efficiency					
			P1dB					
			$Z_{\text{load}}^{(1)}$ (Ω)	Gain (dB)	(dBm)	(W)	η_D (%)	AM/PM (°)
2620	28.0 - j23.1	25.7 + j23.9	24.3 + j8.63	19.5	41.2	13	62.2	-22
2655	36.9 - j21.1	35.7 + j21.2	22.2 + j8.93	19.7	41.0	13	62.8	-22
2690	48.4 - j13.5	44.6 + j15.4	21.1 + j7.02	19.6	41.1	13	62.5	-22

f (MHz)	Z_{source} (Ω)	Z_{in} (Ω)	Max Drain Efficiency					
			P3dB					
			$Z_{\text{load}}^{(2)}$ (Ω)	Gain (dB)	(dBm)	(W)	η_D (%)	AM/PM (°)
2620	28.0 - j23.1	28.0 + j24.6	26.6 + j5.46	17.2	42.3	17	63.1	-27
2655	36.9 - j21.1	39.6 + j20.7	23.4 + j5.31	17.3	42.2	17	63.6	-29
2690	48.4 - j13.5	49.3 + j11.6	21.5 + j5.46	17.4	42.0	16	63.0	-30

(1) Load impedance for optimum P1dB efficiency.

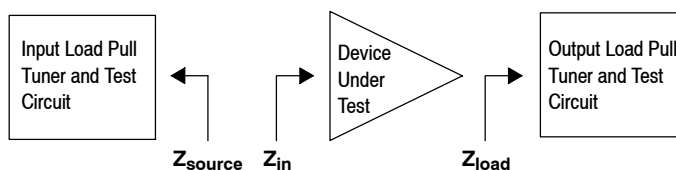
(2) Load impedance for optimum P3dB efficiency.

Z_{source} = Measured impedance presented to the input of the device at the package reference plane.

Z_{in} = Impedance as measured from gate contact to ground.

Z_{load} = Measured impedance presented to the output of the device at the package reference plane.

Figure 9. Carrier Side Load Pull Performance — Maximum Drain Efficiency Tuning



$V_{DD} = 28 \text{ Vdc}$, $V_{GSB} = 1.4 \text{ Vdc}$, Pulsed CW, 10 $\mu\text{sec}(\text{on})$, 10% Duty Cycle

f (MHz)	Z_{source} (Ω)	Z_{in} (Ω)	Max Output Power					
			P1dB					
			$Z_{\text{load}}^{(1)}$ (Ω)	Gain (dB)	(dBm)	(W)	η_D (%)	AM/PM (°)
2620	27.1 - j17.7	22.9 + j19.6	8.62 - j15.3	12.8	46.1	40	58.3	-32
2655	36.7 - j12.5	32.0 + j15.6	8.78 - j15.7	12.8	46.1	40	58.4	-33
2690	39.5 - j2.23	37.9 + j7.03	8.71 - j17.3	12.4	45.9	39	54.9	-33

f (MHz)	Z_{source} (Ω)	Z_{in} (Ω)	Max Output Power					
			P3dB					
			$Z_{\text{load}}^{(2)}$ (Ω)	Gain (dB)	(dBm)	(W)	η_D (%)	AM/PM (°)
2620	27.1 - j17.7	26.5 + j18.9	8.56 - j16.9	10.5	46.7	47	57.3	-37
2655	36.7 - j12.5	35.9 + j11.8	8.57 - j17.0	10.5	46.8	47	57.2	-38
2690	39.5 - j2.23	39.4 + j1.33	9.02 - j18.1	10.4	46.6	46	55.6	-38

(1) Load impedance for optimum P1dB power.

(2) Load impedance for optimum P3dB power.

Z_{source} = Measured impedance presented to the input of the device at the package reference plane.

Z_{in} = Impedance as measured from gate contact to ground.

Z_{load} = Measured impedance presented to the output of the device at the package reference plane.

Figure 10. Peaking Side Load Pull Performance — Maximum Power Tuning

$V_{DD} = 28 \text{ Vdc}$, $V_{GSB} = 1.4 \text{ Vdc}$, Pulsed CW, 10 $\mu\text{sec}(\text{on})$, 10% Duty Cycle

f (MHz)	Z_{source} (Ω)	Z_{in} (Ω)	Max Drain Efficiency					
			P1dB					
			$Z_{\text{load}}^{(1)}$ (Ω)	Gain (dB)	(dBm)	(W)	η_D (%)	AM/PM (°)
2620	27.1 - j17.7	21.4 + j21.6	13.6 - j7.07	14.1	44.4	28	68.7	-38
2655	36.7 - j12.5	31.4 + j19.0	13.5 - j5.38	14.0	44.0	25	68.6	-40
2690	39.5 - j2.23	39.1 + j10.8	13.5 - j7.10	13.9	44.2	26	67.7	-39

f (MHz)	Z_{source} (Ω)	Z_{in} (Ω)	Max Drain Efficiency					
			P3dB					
			$Z_{\text{load}}^{(2)}$ (Ω)	Gain (dB)	(dBm)	(W)	η_D (%)	AM/PM (°)
2620	27.1 - j17.7	25.3 + j21.2	13.9 - j7.07	12.1	44.9	31	68.0	-48
2655	36.7 - j12.5	36.2 + j15.4	12.5 - j7.10	12.1	45.0	31	68.1	-49
2690	39.5 - j2.23	41.9 + j4.53	12.5 - j6.42	12.0	44.6	29	66.9	-50

(1) Load impedance for optimum P1dB efficiency.

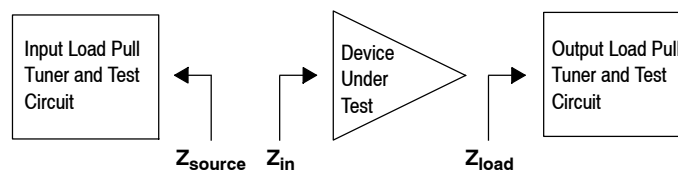
(2) Load impedance for optimum P3dB efficiency.

Z_{source} = Measured impedance presented to the input of the device at the package reference plane.

Z_{in} = Impedance as measured from gate contact to ground.

Z_{load} = Measured impedance presented to the output of the device at the package reference plane.

Figure 11. Peaking Side Load Pull Performance — Maximum Drain Efficiency Tuning



P1dB - TYPICAL CARRIER SIDE LOAD PULL CONTOURS — 2655 MHz

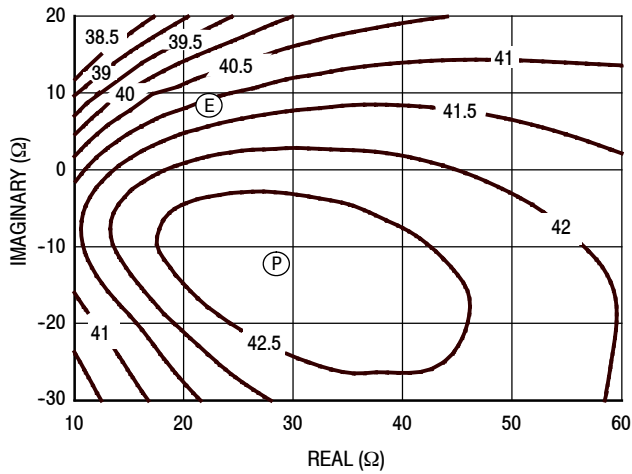


Figure 12. P1dB Load Pull Output Power Contours (dBm)

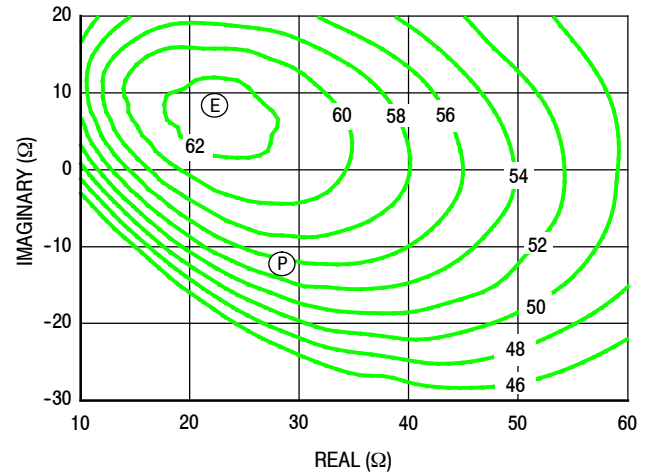


Figure 13. P1dB Load Pull Efficiency Contours (%)

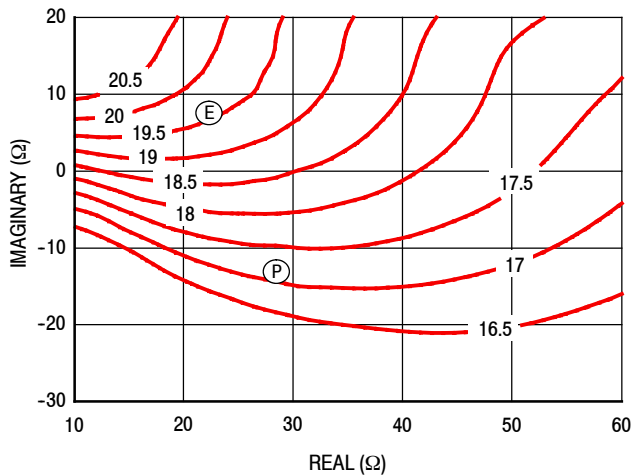


Figure 14. P1dB Load Pull Gain Contours (dB)

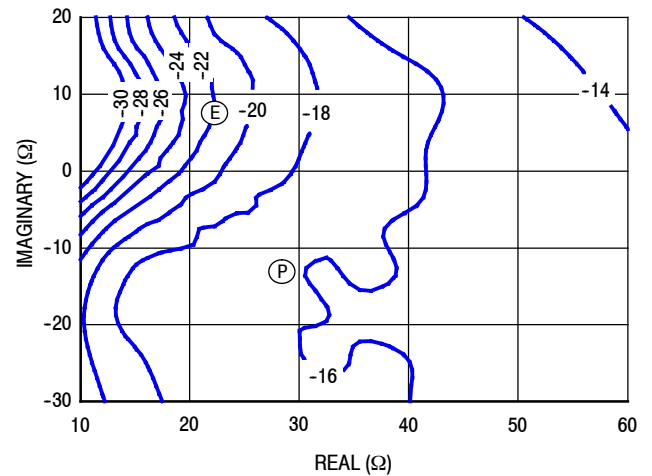


Figure 15. P1dB Load Pull AM/PM Contours (°)

NOTE: (P) = Maximum Output Power

(E) = Maximum Drain Efficiency

- Power Gain
- Drain Efficiency
- Linearity
- Output Power

P3dB - TYPICAL CARRIER SIDE LOAD PULL CONTOURS — 2655 MHz

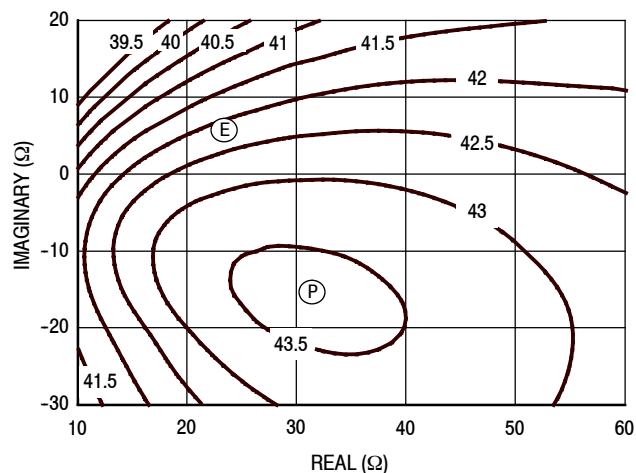


Figure 16. P3dB Load Pull Output Power Contours (dBm)

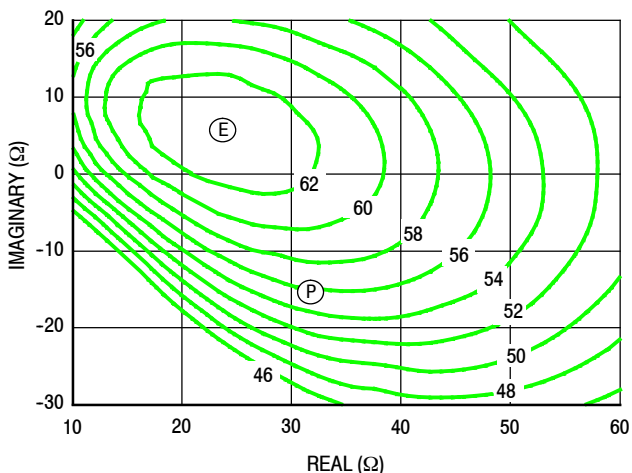


Figure 17. P3dB Load Pull Efficiency Contours (%)

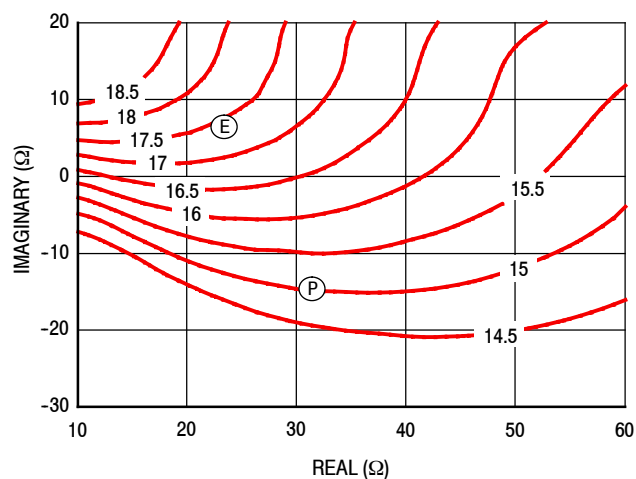


Figure 18. P3dB Load Pull Gain Contours (dB)

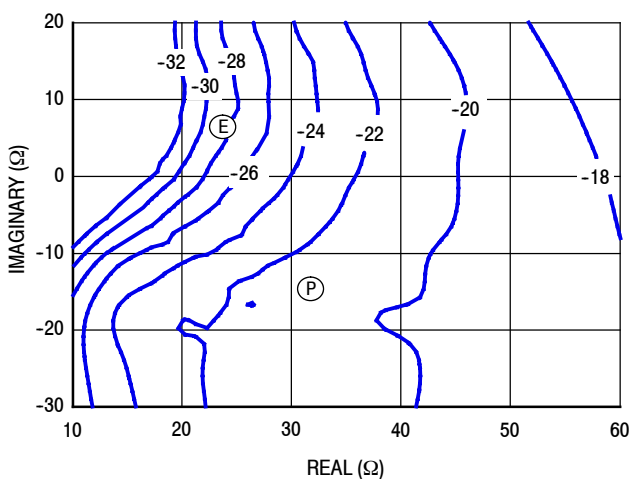


Figure 19. P3dB Load Pull AM/PM Contours (°)

NOTE: (P) = Maximum Output Power
(E) = Maximum Drain Efficiency

- Power Gain
- Drain Efficiency
- Linearity
- Output Power

P1dB - TYPICAL PEAKING SIDE LOAD PULL CONTOURS — 2655 MHz

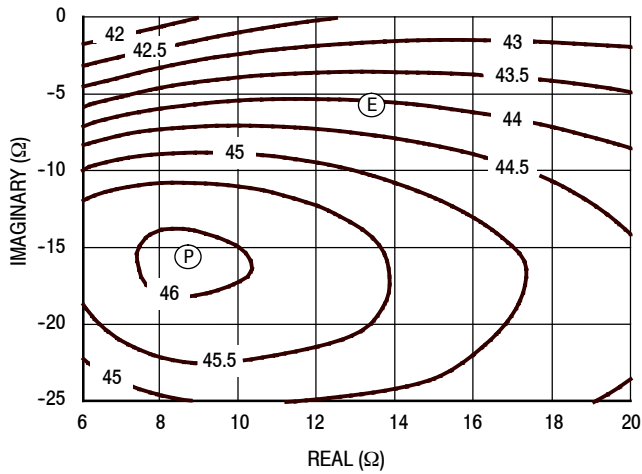


Figure 20. P1dB Load Pull Output Power Contours (dBm)

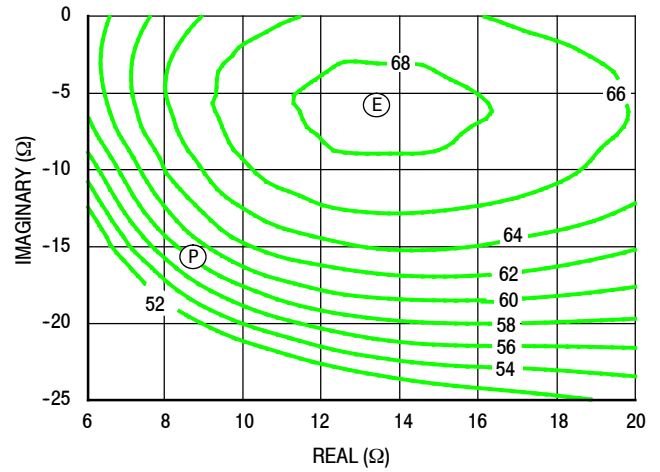


Figure 21. P1dB Load Pull Efficiency Contours (%)

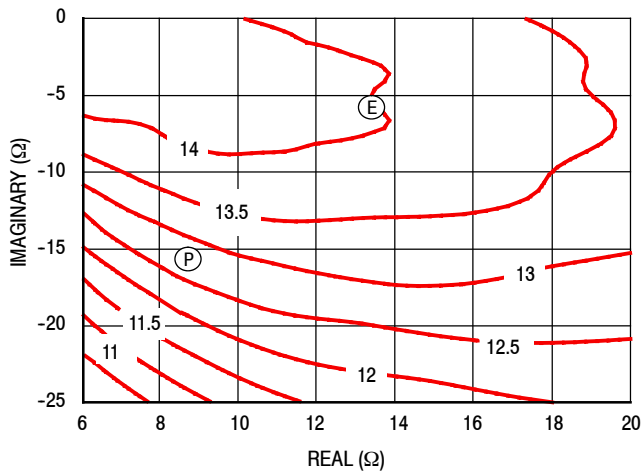


Figure 22. P1dB Load Pull Gain Contours (dB)

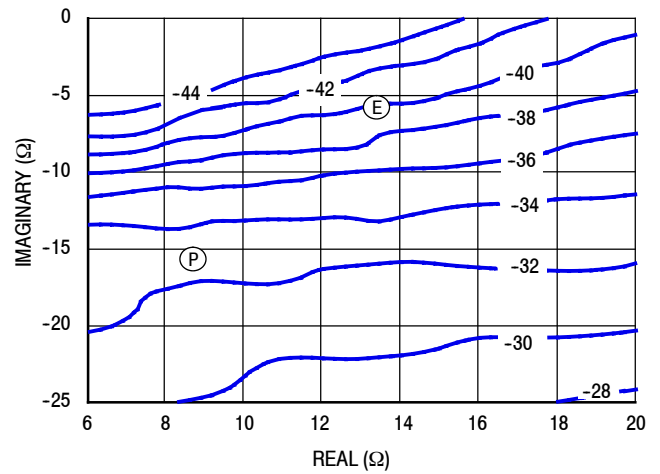


Figure 23. P1dB Load Pull AM/PM Contours (°)

NOTE: (P) = Maximum Output Power
(E) = Maximum Drain Efficiency

- Power Gain
- Drain Efficiency
- Linearity
- Output Power

P3dB - TYPICAL PEAKING SIDE LOAD PULL CONTOURS — 2655 MHz

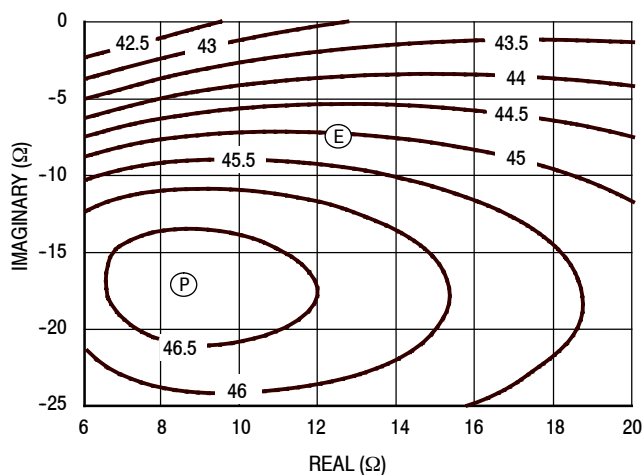


Figure 24. P3dB Load Pull Output Power Contours (dBm)

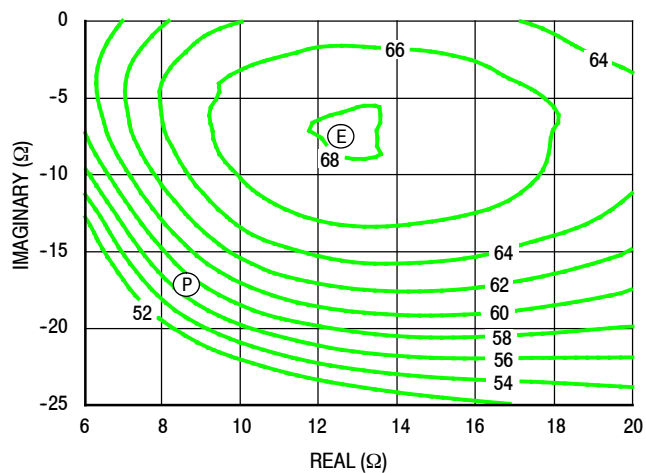


Figure 25. P3dB Load Pull Efficiency Contours (%)

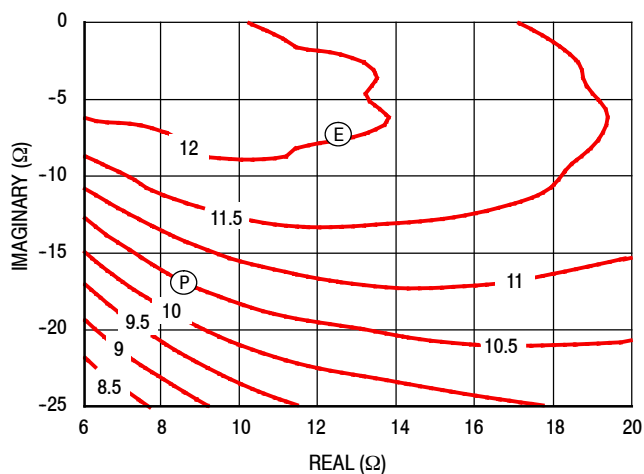


Figure 26. P3dB Load Pull Gain Contours (dB)

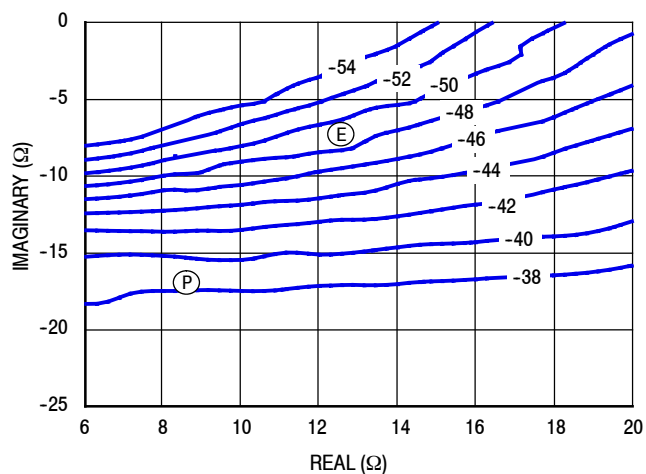
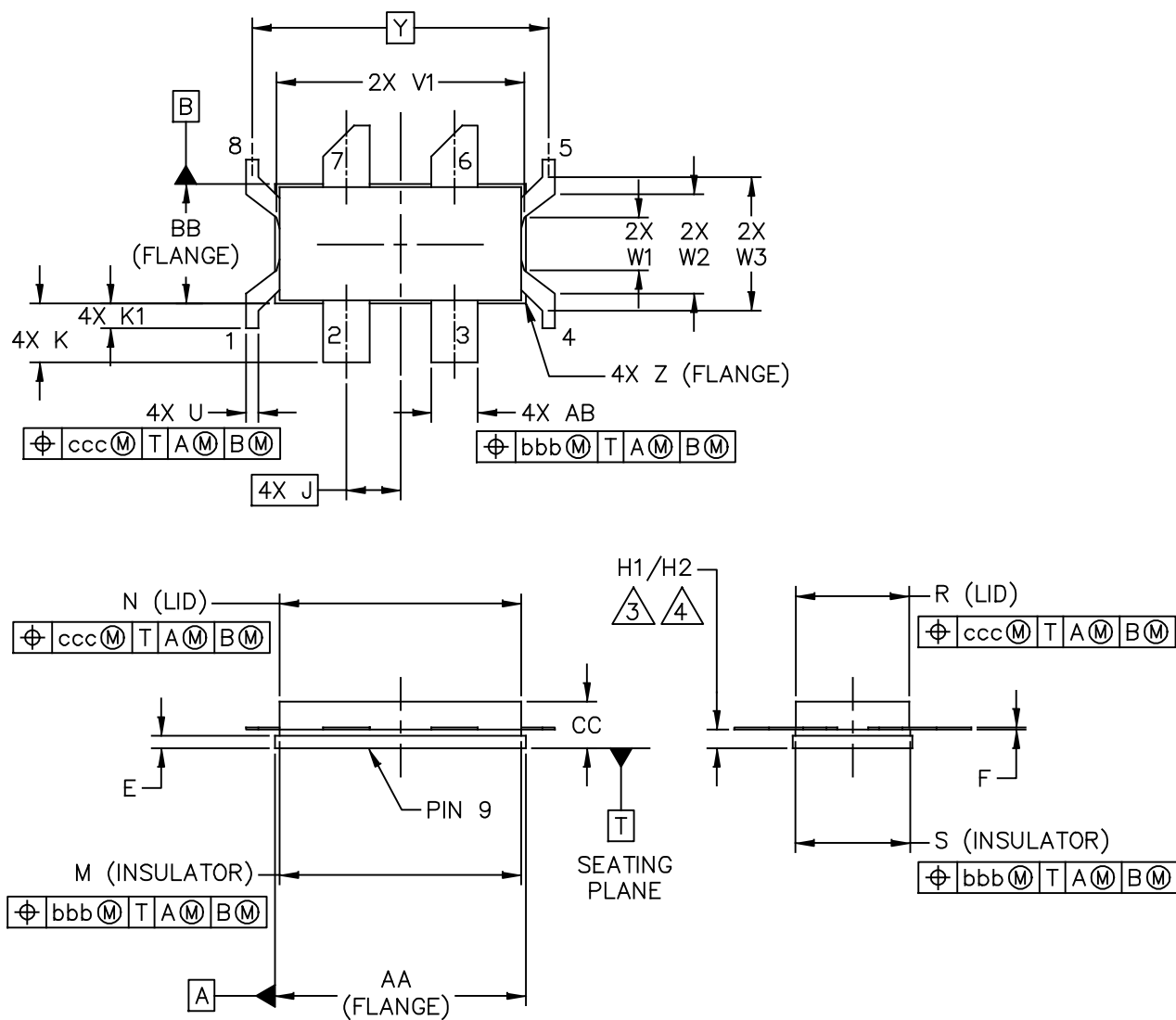


Figure 27. P3dB Load Pull AM/PM Contours (°)

NOTE: (P) = Maximum Output Power
(E) = Maximum Drain Efficiency

- Power Gain
- Drain Efficiency
- Linearity
- Output Power

PACKAGE DIMENSIONS



© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.	MECHANICAL OUTLINE	PRINT VERSION NOT TO SCALE
TITLE: NI-780-4S4	DOCUMENT NO: 98ASA00406D REV: 0	
	STANDARD: NON-JEDEC	
	08 MAR 2013	

NOTES:

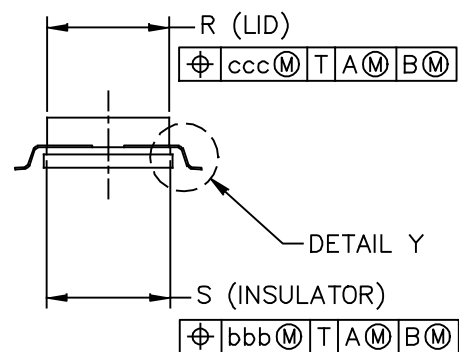
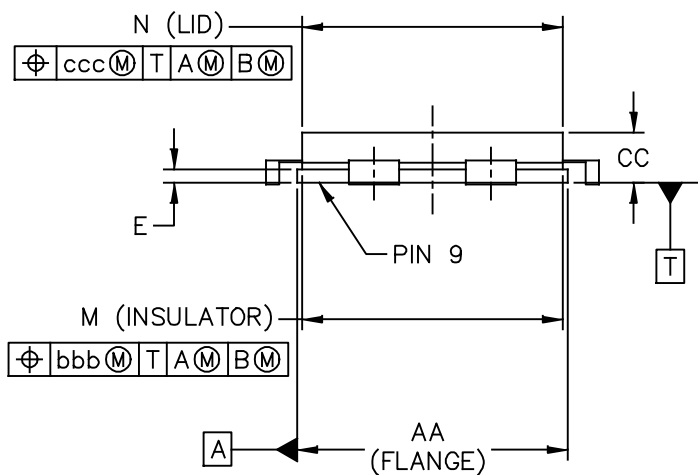
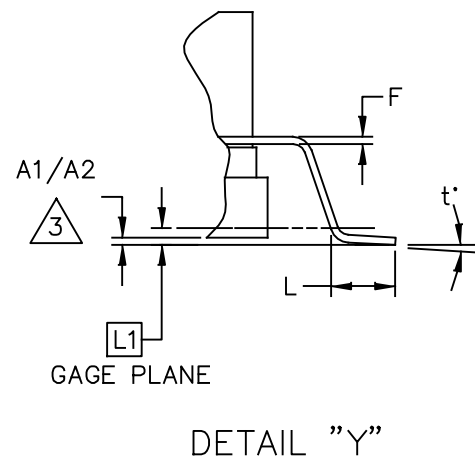
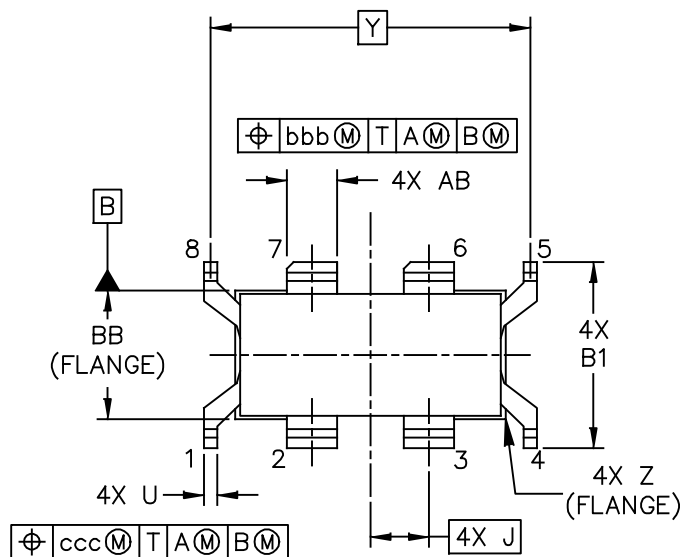
1. CONTROLLING DIMENSION: INCH.

2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M–1994.

3. DIMENSIONS H1 AND H2 ARE MEASURED .030 INCH (0.762 MM) AWAY FROM FLANGE PARALLEL TO DATUM B. H1 APPLIES TO PINS 2, 3, 6 & 7. H2 APPLIES TO PINS 1, 4, 5 & 8.

4. TOLERANCE OF DIMENSION H2 IS TENTATIVE AND COULD CHANGE ONCE SUFFICIENT MANUFACTURING DATA IS AVAILABLE.

INCH		MILLIMETER		INCH		MILLIMETER	
DIM	MIN	MAX	MIN	MAX	DIM	MIN	MAX
AA	.805	— .815	20.45	— 20.70	R	.365	— .375
BB	.380	— .390	9.65	— 9.91	S	.365	— .375
CC	.125	— .170	3.18	— 4.32	U	.035	— .045
E	.035	— .045	0.89	— 1.14	V1	.795	— .805
F	.004	— .007	0.10	— 0.18	W1	.165	— .175
H1	.057	— .067	1.45	— 1.70	W2	.315	— .325
H2	.054	— .070	1.37	— 1.78	W3	.425	— .435
J	.175 BSC		4.45 BSC		Y	.956 BSC	
K	.170	— .210	4.32	— 5.33	Z	R.000	— R.040
K1	.070	— .090	1.78	— 2.29	AB	.145	— .155
M	.774	— .786	19.66	— 19.96	aaa	— .005	—
N	.772	— .788	19.61	— 20.02	bbb	— .010	—
					ccc	— .015	—
© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.			MECHANICAL OUTLINE			PRINT VERSION NOT TO SCALE	
TITLE: NI—780—4S4					DOCUMENT NO: 98ASA00406D REV: 0		
					STANDARD: NON—JEDEC		
					08 MAR 2013		



© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.	MECHANICAL OUTLINE	PRINT VERSION NOT TO SCALE
TITLE: NI-780-4S4 GULL	DOCUMENT NO: 98ASA00407D REV: 0	
	STANDARD: NON-JEDEC	
	08 MAR 2013	

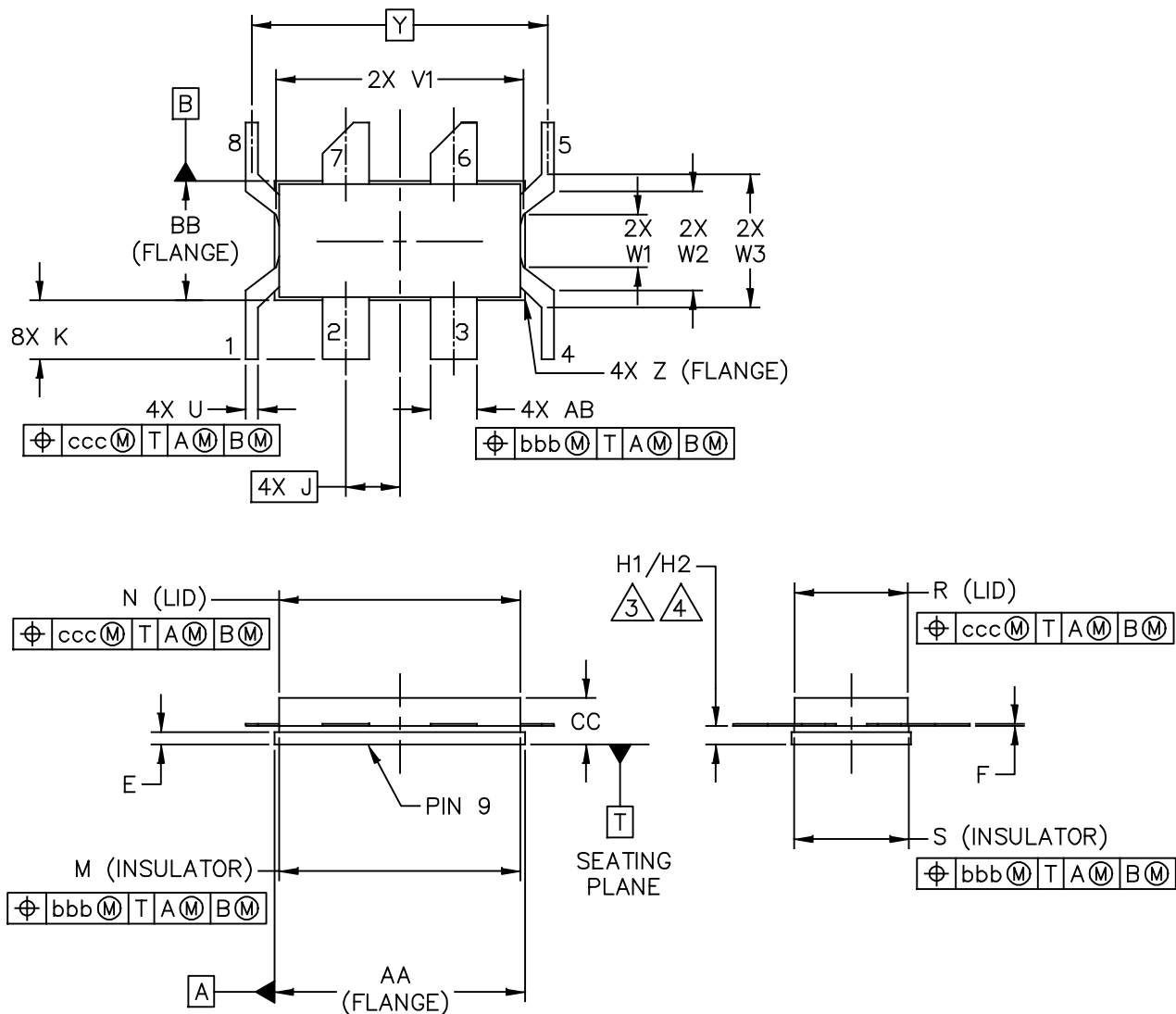
NOTES:

1. CONTROLLING DIMENSION: INCH.
2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M–1994.



3. DIMENSION A1/A2 IS MEASURED WITH REFERENCE TO DATUM T. THE POSITIVE VALUE IMPLIES THAT THE PACKAGE BOTTOM IS HIGHER THAN THE LEAD BOTTOM.
A1 APPLIES TO PINS 2, 3, 6 & 7. A2 APPLIES TO PINS 1, 4, 5 & 8

INCH		MILLIMETER		INCH		MILLIMETER	
DIM	MIN	MAX	MIN	MAX	DIM	MIN	MAX
AA	.805	— .815	20.45	— 20.70	R	.365	— .375
A1	.000	— .010	0.00	— 0.25	S	.365	— .375
A2	— .003	— .013	— 0.08	— 0.33	U	.035	— .045
BB	.380	— .390	9.65	— 9.91	Y	.956 BSC	
B1	.549	— .559	13.94	— 14.20	Z	R.000 — R.040	
CC	.125	— .170	3.18	— 4.32	AB	.145	— .155
E	.035	— .045	0.89	— 1.14	t*	0*	— 8*
F	.004	— .007	0.10	— 0.18	aaa	— .005	—
J	.175 BSC		4.45 BSC		bbb	— .010	—
L	.038	— .046	0.97	— 1.17	ccc	— .015	—
L1	.01 BSC		0.25 BSC				
M	.774	— .786	19.66	— 19.96			
N	.772	— .788	19.61	— 20.02			
© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.			MECHANICAL OUTLINE			PRINT VERSION NOT TO SCALE	
TITLE: NI—780—4S4 GULL					DOCUMENT NO: 98ASA00407D REV: 0		
					STANDARD: NON—JEDEC		
					08 MAR 2013		



TITLE: NI-780S-4L4L	© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.	MECHANICAL OUTLINE	PRINT VERSION NOT TO SCALE
	DOCUMENT NO: 98ASA00581D REV: 0		
	STANDARD: NON-JEDEC		
	09 APR 2013		

NOTES:

1. CONTROLLING DIMENSION: INCH.

2. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.

3. DIMENSIONS H1 AND H2 ARE MEASURED .030 INCH (0.762 MM) AWAY FROM FLANGE PARALLEL TO DATUM B. H1 APPLIES TO PINS 2, 3, 6 & 7. H2 APPLIES TO PINS 1, 4, 5 & 8.

4. TOLERANCE OF DIMENSION H2 IS TENTATIVE AND COULD CHANGE ONCE SUFFICIENT MANUFACTURING DATA IS AVAILABLE.

INCH			MILLIMETER		DIM	INCH		MILLIMETER	
DIM	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
AA	.805	.815	20.45	20.70	R	.365	.375	9.27	9.53
BB	.380	.390	9.65	9.91	S	.365	.375	9.27	9.53
CC	.125	.170	3.18	4.32	U	.035	.045	0.89	1.14
E	.035	.045	0.89	1.14	V1	.795	.805	20.19	20.45
F	.004	.007	0.10	0.18	W1	.165	.175	4.19	4.45
H1	.057	.067	1.45	1.70	W2	.315	.325	8.00	8.26
H2	.054	.070	1.37	1.78	W3	.425	.435	10.80	11.05
J	.175 BSC		4.45 BSC		Y	.956 BSC		24.28 BSC	
K	.170	.210	4.32	5.33	Z	R.000	R.040	R0.00	R1.02
M	.774	.786	19.66	19.96	AB	.145	.155	3.68	3.94
N	.772	.788	19.61	20.02	aaa	.005		0.13	
					bbb	.010		0.25	
					ccc	.015		0.38	
© FREESCALE SEMICONDUCTOR, INC. ALL RIGHTS RESERVED.			MECHANICAL OUTLINE			PRINT VERSION NOT TO SCALE			
TITLE: NI-780S-4L4L					DOCUMENT NO: 98ASA00581D REV: 0				
					STANDARD: NON-JEDEC				
					09 APR 2013				

APPENDIX

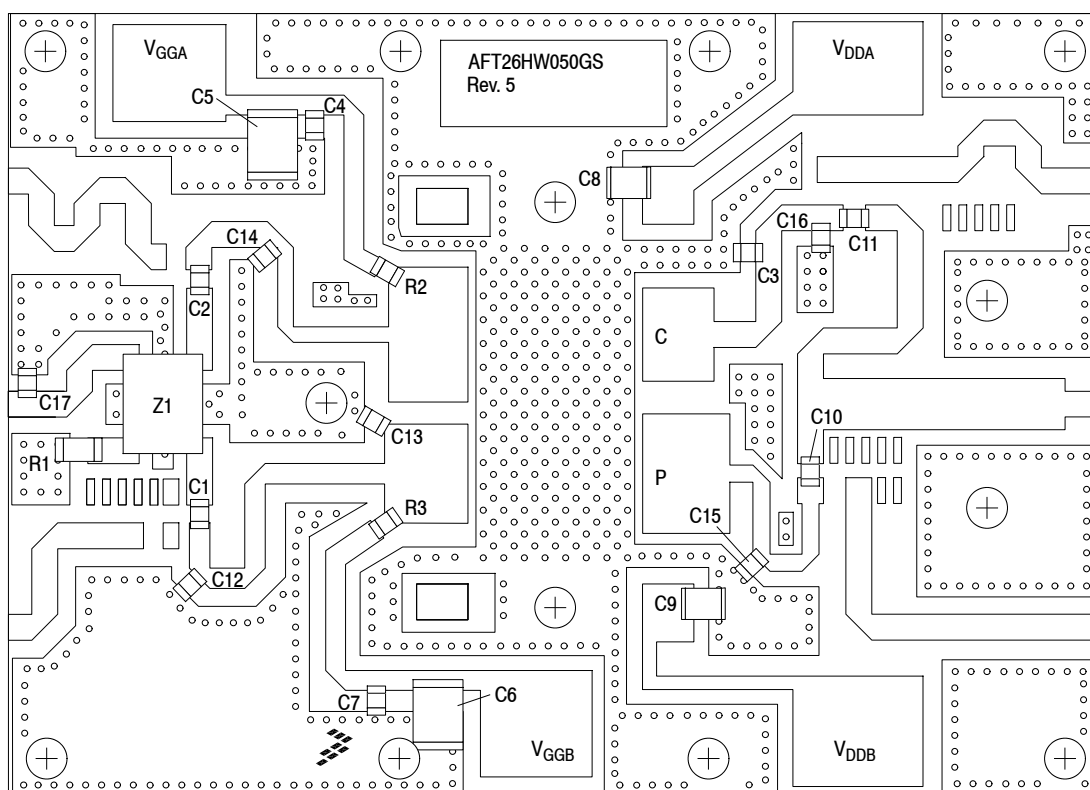


Figure A-1. AFT26HW050GS Rev. 5 Characterization Test Circuit Component Layout

Table A-1. AFT26HW050GS Rev. 5 Characterization Test Circuit Component Designations and Values

Part	Description	Part Number	Manufacturer
C1	3.3 pF Chip Capacitor	08051J3R3CBTTR	AVX
C2, C4, C7, C10, C11	4.7 pF Chip Capacitors	08051J4R7CBTTR	AVX
C3, C12, C13, C15	0.5 pF Chip Capacitors	08051J0R5BBTTR	AVX
C5, C6	4.7 μ F Chip Capacitors	C4532X7S2A475M230KB	TDK
C8, C9	3.3 μ F Chip Capacitors	C3225X7S2A335M200AB	TDK
C14, C17	0.2 pF Chip Capacitors	08051J0R2ABTTR	AVX
C16	0.1 pF Chip Capacitor	08051J0R1ABTTR	AVX
R1	51 Ω , 1/4 W Chip Resistor	WCR1206-51FI	Welwyn
R2, R3	4.7 Ω , 1/8 W Chip Resistors	WCR0805-4R7FI	Welwyn
Z1	2300–2700 MHz Band, 90°, 5 dB Hybrid Coupler	X3C25P1-05S	Anaren
PCB	0.030", $\epsilon_r = 3.5$	RF35A2	Taconic

PRODUCT DOCUMENTATION, SOFTWARE AND TOOLS

Refer to the following documents, software and tools to aid your design process.

Application Notes

- AN1955: Thermal Measurement Methodology of RF Power Amplifiers

Engineering Bulletins

- EB212: Using Data Sheet Impedances for RF LDMOS Devices

Software

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

Development Tools

- Printed Circuit Boards

For Software and Tools, do a Part Number search at <http://www.freescale.com>, and select the “Part Number” link. Go to the Software & Tools tab on the part’s Product Summary page to download the respective tool.

REVISION HISTORY

The following table summarizes revisions to this document.

Revision	Date	Description
0	May 2013	• Initial Release of Data Sheet
1	June 2013	• Added part number AFT26H050W26SR3, p. 1 • Added NI-780S-4L4L package isometric, p. 1, and Mechanical Outline, p. 17, 18
2	July 2013	• AFT26HW050S data sheet frequency changed from 2620 MHz to 2496 MHz to show part performance capability in the 2496-2690 MHz frequency range, p. 1 • Fig. 3, Single-Carrier Output Peak-to-Average Ratio Compression (PARC) Broadband Performance @ $P_{out} = 9$ Watts Avg., updated to reflect part performance in the 2496-2690 MHz frequency range, p. 5

How to Reach Us:

Home Page:
freescale.com

Web Support:
freescale.com/support

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

Freescale reserves the right to make changes without further notice to any products herein. Freescale makes no warranty, representation, or guarantee regarding the suitability of its products for any particular purpose, nor does Freescale 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 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 does not convey any license under its patent rights nor the rights of others. Freescale sells products pursuant to standard terms and conditions of sale, which can be found at the following address: freescale.com/SalesTermsandConditions.

Freescale and the Freescale logo are trademarks of Freescale Semiconductor, Inc., Reg. U.S. Pat. & Tm. Off. Airfast is a trademark of Freescale Semiconductor, Inc. All other product or service names are the property of their respective owners.

© 2013 Freescale Semiconductor, Inc.



AMEYA360

Components Supply Platform

Authorized Distribution Brand :



Website :

Welcome to visit www.ameya360.com

Contact Us :

➤ Address :

401 Building No.5, JiuGe Business Center, Lane 2301, Yishan Rd
Minhang District, Shanghai , China

➤ Sales :

Direct +86 (21) 6401-6692

Email amall@ameya360.com

QQ 800077892

Skype ameyasales1 ameyasales2

➤ Customer Service :

Email service@ameya360.com

➤ Partnership :

Tel +86 (21) 64016692-8333

Email mkt@ameya360.com