



# RF Power LDMOS Transistor

## N-Channel Enhancement-Mode Lateral MOSFET

This 56 W asymmetrical Doherty RF power LDMOS transistor is designed for cellular base station applications requiring very wide instantaneous bandwidth capability covering the frequency range of 2110 to 2200 MHz.

### 2100 MHz

- Typical Doherty Single-Carrier W-CDMA Performance:  $V_{DD} = 28$  Vdc,  $I_{DQA} = 600$  mA,  $V_{GSB} = 0.6$  Vdc,  $P_{out} = 56$  W Avg., Input Signal PAR = 9.9 dB @ 0.01% Probability on CCDF.

Frequency	$G_{ps}$ (dB)	$\eta_D$ (%)	Output PAR (dB)	ACPR (dBc)
2110 MHz	16.4	52.0	7.7	-29.3
2140 MHz	16.6	51.7	7.6	-30.2
2170 MHz	16.7	50.7	7.3	-30.7
2200 MHz	16.5	49.6	7.2	-31.1

### Features

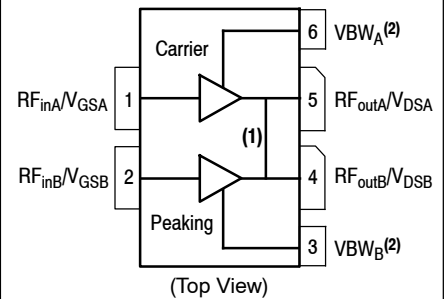
- Advanced high performance in-package Doherty
- Designed for wide instantaneous bandwidth applications
- Greater negative gate-source voltage range for improved Class C operation
- Able to withstand extremely high output VSWR and broadband operating conditions
- Designed for digital predistortion error correction systems

## A3T21H360W23SR6

**2110–2200 MHz, 56 W AVG., 28 V AIRFAST RF POWER LDMOS TRANSISTOR**



ACP-1230S-4L2S



**Figure 1. Pin Connections**

1. Pin connections 4 and 5 are DC coupled and RF independent.
2. Device can operate with  $V_{DD}$  current supplied through pin 3 and pin 6.

**Table 1. Maximum Ratings**

Rating	Symbol	Value	Unit
Drain-Source Voltage	$V_{DSS}$	-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
CW Operation @ $T_C = 25^\circ\text{C}$ when DC current is fed through pin 3 and pin 6 Derate above $25^\circ\text{C}$	CW	156 0.9	W W/°C

**Table 2. Thermal Characteristics**

Characteristic	Symbol	Value (2,3)	Unit
Thermal Resistance, Junction to Case Case Temperature $77^\circ\text{C}$ , 56 W Avg., W-CDMA, 28 Vdc, $I_{DQA} = 600\text{ mA}$ , $V_{GSB} = 0.6\text{ Vdc}$ , 2155 MHz	$R_{\theta JC}$	0.21	°C/W

**Table 3. ESD Protection Characteristics**

Test Methodology	Class
Human Body Model (per JESD22-A114)	2
Charge Device Model (per JESD22-C101)	C3

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

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

Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 65\text{ Vdc}$ , $V_{GS} = 0\text{ Vdc}$ )	$I_{DSS}$	—	—	10	$\mu\text{Adc}$
Zero Gate Voltage Drain Leakage Current ( $V_{DS} = 32\text{ Vdc}$ , $V_{GS} = 0\text{ Vdc}$ )	$I_{DSS}$	—	—	5	$\mu\text{Adc}$
Gate-Source Leakage Current ( $V_{GS} = 5\text{ Vdc}$ , $V_{DS} = 0\text{ Vdc}$ )	$I_{GSS}$	—	—	1	$\mu\text{Adc}$

**On Characteristics - Side A, Carrier**

Gate Threshold Voltage ( $V_{DS} = 10\text{ Vdc}$ , $I_D = 120\ \mu\text{Adc}$ )	$V_{GS(th)}$	1.4	1.8	2.3	Vdc
Gate Quiescent Voltage ( $V_{DD} = 28\text{ Vdc}$ , $I_{DA} = 600\text{ mAdc}$ , Measured in Functional Test)	$V_{GSA(Q)}$	2.3	2.7	3.1	Vdc
Drain-Source On-Voltage ( $V_{GS} = 10\text{ Vdc}$ , $I_D = 1.2\text{ Adc}$ )	$V_{DS(on)}$	0.1	0.15	0.3	Vdc

**On Characteristics - Side B, Peaking**

Gate Threshold Voltage ( $V_{DS} = 10\text{ Vdc}$ , $I_D = 240\ \mu\text{Adc}$ )	$V_{GS(th)}$	0.8	1.2	1.6	Vdc
Drain-Source On-Voltage ( $V_{GS} = 10\text{ Vdc}$ , $I_D = 2.4\text{ Adc}$ )	$V_{DS(on)}$	0.1	0.15	0.3	Vdc

1. Continuous use at maximum temperature will affect MTTF.
2. MTTF calculator available at <http://www.nxp.com/RF/calculators>.
3. Refer to AN1955, *Thermal Measurement Methodology of RF Power Amplifiers*. Go to <http://www.nxp.com/RF> and search for AN1955.
4. Side A and Side B are tied together for these measurements.

(continued)

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>Functional Tests</b> <sup>(1,2,3)</sup> (In NXP Doherty Test Fixture, 50 ohm system) $V_{DD} = 28\text{ Vdc}$ , $I_{DQA} = 600\text{ mA}$ , $V_{GSB} = 0.6\text{ Vdc}$ , $P_{out} = 56\text{ W Avg.}$ , $f = 2110\text{ MHz}$ , 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	$G_{ps}$	15.7	16.4	18.7	dB
Drain Efficiency	$\eta_D$	49.0	52.0	—	%
$P_{out}$ @ 3 dB Compression Point, CW	P3dB	54.7	55.3	—	dBm
Adjacent Channel Power Ratio	ACPR	—	-29.3	-27.0	dBc

**Load Mismatch** <sup>(3)</sup> (In NXP Doherty Test Fixture, 50 ohm system)  $I_{DQA} = 600\text{ mA}$ ,  $V_{GSB} = 0.6\text{ Vdc}$ ,  $f = 2140\text{ MHz}$ , 12  $\mu\text{sec(on)}$ , 10% Duty Cycle

VSWR 10:1 at 32 Vdc, 308 W Pulsed CW Output Power (3 dB Input Overdrive from 206 W Pulsed CW Rated Power)	No Device Degradation
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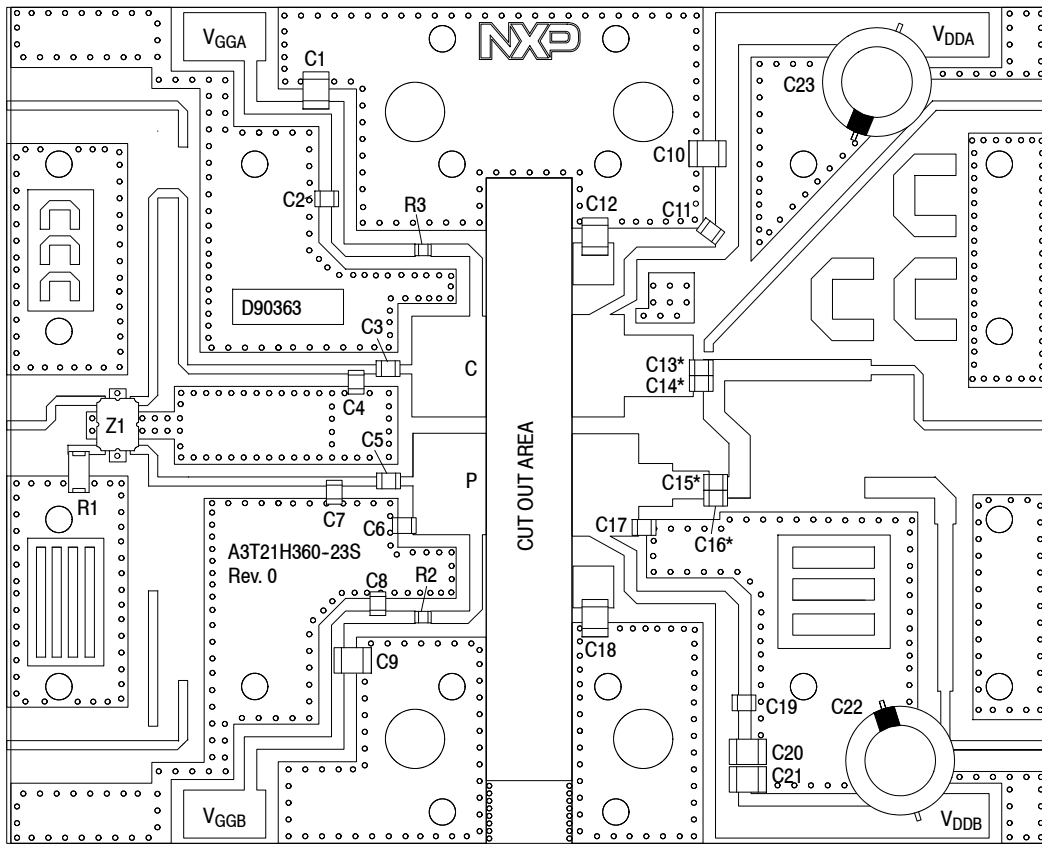
**Typical Performance** <sup>(3)</sup> (In NXP Doherty Test Fixture, 50 ohm system)  $V_{DD} = 28\text{ Vdc}$ ,  $I_{DQA} = 600\text{ mA}$ ,  $V_{GSB} = 0.6\text{ Vdc}$ , 2110–2200 MHz Bandwidth

$P_{out}$ @ 3 dB Compression Point <sup>(4)</sup>	P3dB	—	348	—	W
AM/PM (Maximum value measured at the P3dB compression point across the 2110–2200 MHz bandwidth)	$\Phi$	—	-32	—	$^\circ$
VBW Resonance Point (IMD Third Order Intermodulation Inflection Point)	$VBW_{res}$	—	125	—	MHz
Gain Flatness in 90 MHz Bandwidth @ $P_{out} = 56\text{ W Avg.}$	$G_F$	—	0.3	—	dB
Gain Variation over Temperature (-30°C to +85°C)	$\Delta G$	—	0.005	—	dB/°C
Output Power Variation over Temperature (-30°C to +85°C)	$\Delta P_{1dB}$	—	0.003	—	dB/°C

**Table 5. Ordering Information**

Device	Tape and Reel Information	Package
A3T21H360W23SR6	R6 Suffix = 150 Units, 56 mm Tape Width, 13-inch Reel	ACP-1230S-4L2S

- $V_{DDA}$  and  $V_{ddb}$  must be tied together and powered by a single DC power supply.
- Part internally matched both on input and output.
- Measurements made with device in an asymmetrical Doherty configuration.
- $P_{3dB} = P_{avg} + 7.0\text{ dB}$  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.



\*C13, C14, C15, and C16 are mounted vertically.

Note: V<sub>DDA</sub> and V<sub>ddb</sub> must be tied together and powered by a single DC power supply.

**Figure 2. A3T21H360W23SR6 Test Circuit Component Layout**

**Table 6. A3T21H360W23SR6 Test Circuit Component Designations and Values**

Part	Description	Part Number	Manufacturer
C1, C9, C10, C12, C18, C20, C21	10 $\mu$ F Chip Capacitor	GRM32ER61H106KA12L	Murata
C2, C8	9.1 pF Chip Capacitor	GQM2195C2E9R1BB12D	Murata
C3, C5	27 pF Chip Capacitor	ATC600F270JT250XT	ATC
C4, C17	0.8 pF Chip Capacitor	ATC600F0R8BT250XT	ATC
C6, C7	1 pF Chip Capacitor	ATC600F1R0BT250XT	ATC
C11, C19	12 pF Chip Capacitor	GQM2195C2E120FB12D	Murata
C13, C14	2.2 pF Chip Capacitor	GQM2195C2E2R2BB12D	Murata
C15, C16	2 pF Chip Capacitor	GQM2195C2E2R0BB12D	Murata
C22, C23	220 $\mu$ F, 50 V Electrolytic Capacitor	227CKS050M	Illinois Capacitor
R1	50 $\Omega$ , 4 W Termination Chip Resistor	ATCCW12010T0050GBK	ATC
R2, R3	2.2 $\Omega$ , 1/4 W Chip Resistor	CRCW12062R20JNEA	Vishay
Z1	2000-2300 MHz Band, 90°, 5 dB Directional Coupler	X3C21P1-05S	Anaren
PCB	Rogers RO4350B, 0.020", $\epsilon_r = 3.66$	D90363	MTL

### TYPICAL CHARACTERISTICS — 2110–2200 MHz

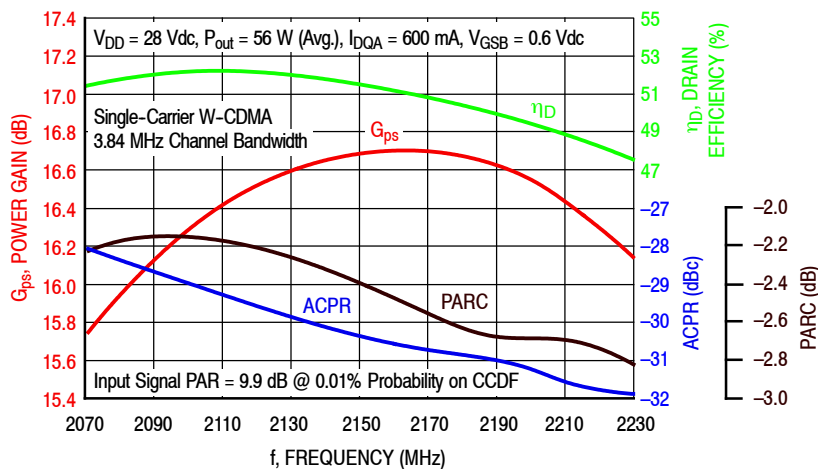


Figure 3. Single-Carrier Output Peak-to-Average Ratio Compression (PARC) Broadband Performance @  $P_{out} = 56$  Watts Avg.

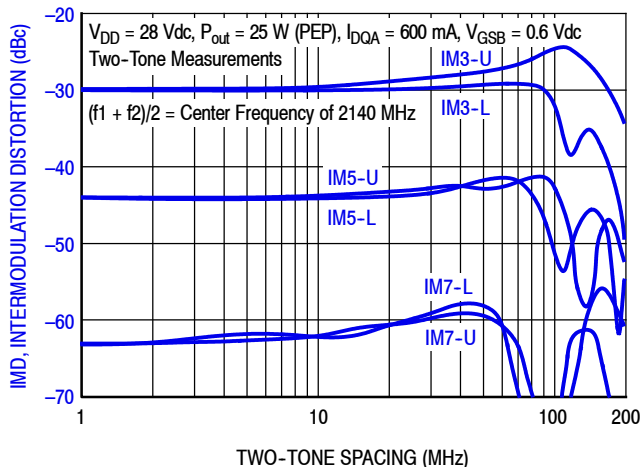


Figure 4. Intermodulation Distortion Products versus Two-Tone Spacing

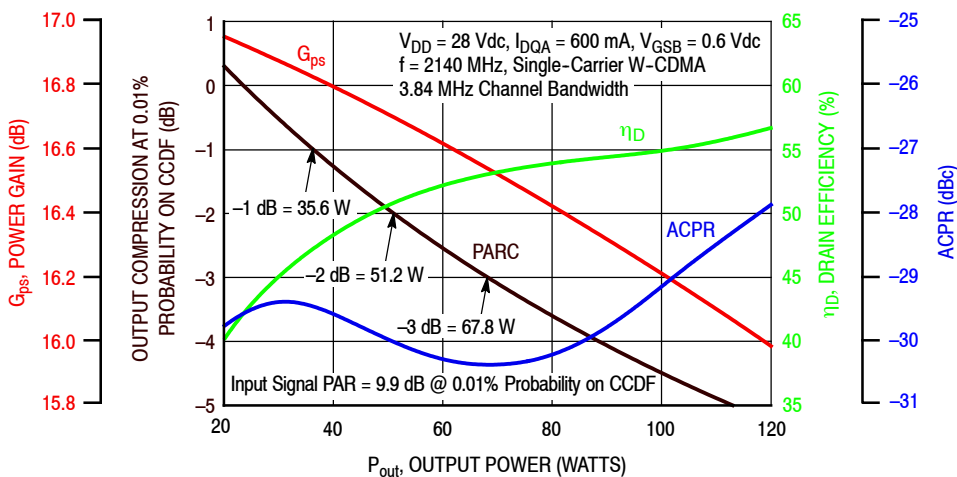
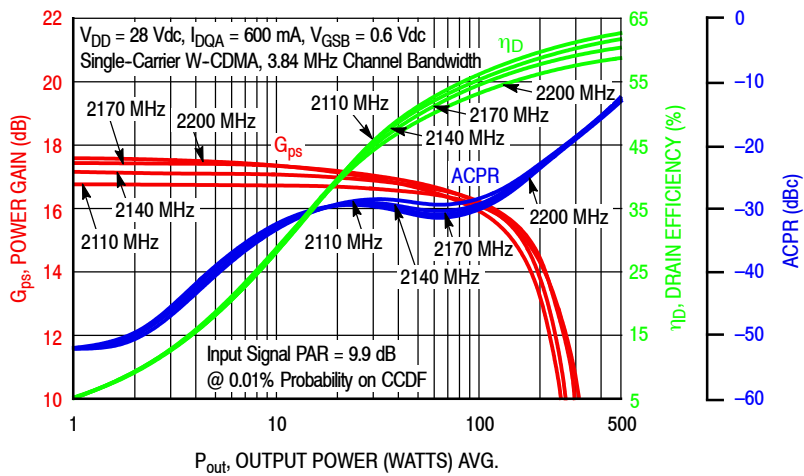
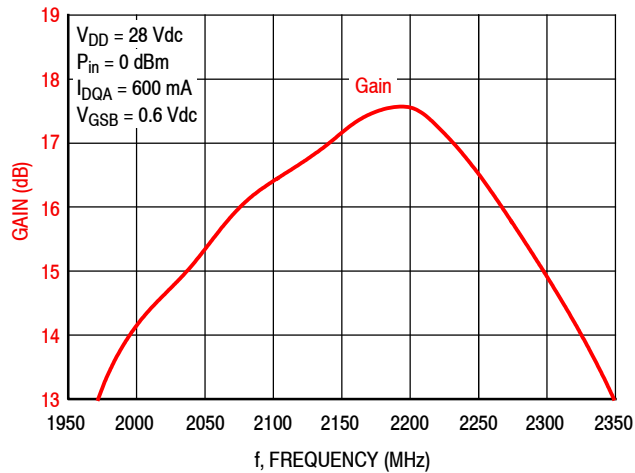


Figure 5. Output Peak-to-Average Ratio Compression (PARC) versus Output Power

## TYPICAL CHARACTERISTICS — 2110–2200 MHz



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



**Figure 7. Broadband Frequency Response**

**Table 7. Carrier Side Load Pull Performance — Maximum Power Tuning**

$V_{DD} = 28 \text{ Vdc}$ ,  $I_{DQA} = 604 \text{ mA}$ , Pulsed CW, 10  $\mu\text{sec}(\text{on})$ , 10% Duty Cycle

f (MHz)	$Z_{\text{source}} (\Omega)$	$Z_{\text{in}} (\Omega)$	Max Output Power					
			P1dB					
			$Z_{\text{load}}^{(1)} (\Omega)$	Gain (dB)	(dBm)	(W)	$\eta_D$ (%)	AM/PM (°)
2110	4.00 – j9.46	3.69 + j8.52	2.65 – j6.39	17.9	51.7	148	59.3	-13
2140	5.01 – j9.50	4.30 + j8.67	2.62 – j6.38	18.1	51.6	146	59.0	-13
2170	6.30 – j9.09	5.01 + j8.70	2.52 – j6.21	18.4	51.6	144	58.5	-15
2200	8.01 – j7.71	6.12 + j8.17	2.38 – j6.20	18.5	51.6	145	58.2	-13

f (MHz)	$Z_{\text{source}} (\Omega)$	$Z_{\text{in}} (\Omega)$	Max Output Power					
			P3dB					
			$Z_{\text{load}}^{(2)} (\Omega)$	Gain (dB)	(dBm)	(W)	$\eta_D$ (%)	AM/PM (°)
2110	4.00 – j9.46	3.60 + j9.13	2.68 – j6.73	15.7	52.4	174	60.3	-18
2140	5.01 – j9.50	4.33 + j9.40	2.62 – j6.63	16.0	52.3	172	59.9	-18
2170	6.30 – j9.09	5.31 + j9.49	2.53 – j6.61	16.1	52.3	169	58.8	-19
2200	8.01 – j7.71	6.79 + j8.94	2.47 – j6.56	16.3	52.3	170	59.2	-18

(1) Load impedance for optimum P1dB power.

(2) Load impedance for optimum P3dB power.

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

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

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

**Table 8. Carrier Side Load Pull Performance — Maximum Efficiency Tuning**

$V_{DD} = 28 \text{ Vdc}$ ,  $I_{DQA} = 604 \text{ mA}$ , Pulsed CW, 10  $\mu\text{sec}(\text{on})$ , 10% Duty Cycle

f (MHz)	$Z_{\text{source}} (\Omega)$	$Z_{\text{in}} (\Omega)$	Max Drain Efficiency					
			P1dB					
			$Z_{\text{load}}^{(1)} (\Omega)$	Gain (dB)	(dBm)	(W)	$\eta_D$ (%)	AM/PM (°)
2110	4.00 – j9.46	3.57 + j8.75	4.75 – j3.46	20.8	49.7	94	71.0	-23
2140	5.01 – j9.50	4.21 + j8.90	4.49 – j3.31	21.1	49.5	90	70.0	-24
2170	6.30 – j9.09	5.00 + j8.90	4.14 – j3.68	21.1	49.7	94	69.0	-22
2200	8.01 – j7.71	6.22 + j8.35	3.82 – j3.57	21.3	49.6	91	69.0	-22

f (MHz)	$Z_{\text{source}} (\Omega)$	$Z_{\text{in}} (\Omega)$	Max Drain Efficiency					
			P3dB					
			$Z_{\text{load}}^{(2)} (\Omega)$	Gain (dB)	(dBm)	(W)	$\eta_D$ (%)	AM/PM (°)
2110	4.00 – j9.46	3.39 + j9.20	4.66 – j3.64	18.7	50.4	110	71.6	-30
2140	5.01 – j9.50	4.10 + j9.49	4.23 – j3.73	18.8	50.4	111	70.5	-30
2170	6.30 – j9.09	5.12 + j9.63	4.02 – j3.88	18.9	50.5	112	69.5	-29
2200	8.01 – j7.71	6.64 + j9.14	3.57 – j4.50	18.6	51.0	127	69.6	-26

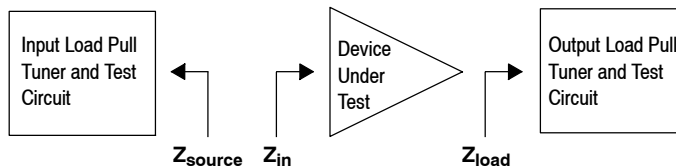
(1) Load impedance for optimum P1dB efficiency.

(2) Load impedance for optimum P3dB efficiency.

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

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

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



**Table 9. Peaking Side Load Pull Performance — Maximum Power Tuning**

$V_{DD} = 28$  Vdc,  $V_{GSB} = 1.5$  Vdc, Pulsed CW, 10  $\mu$ sec(on), 10% Duty Cycle

f (MHz)	$Z_{source}$ ( $\Omega$ )	$Z_{in}$ ( $\Omega$ )	Max Output Power					
			P1dB					
			$Z_{load}^{(1)}$ ( $\Omega$ )	Gain (dB)	(dBm)	(W)	$\eta_D$ (%)	AM/PM ( $^\circ$ )
2110	4.10 – j7.99	3.33 + j8.00	2.22 – j5.00	16.9	55.2	328	59.1	–30
2140	5.10 – j7.80	4.11 + j8.17	2.21 – j4.94	17.2	55.1	327	59.6	–31
2170	6.30 – j6.90	5.21 + j8.06	2.17 – j4.98	17.3	55.1	321	58.4	–32
2200	7.30 – j5.00	6.72 + j7.19	2.15 – j4.88	17.5	55.1	323	59.5	–31

f (MHz)	$Z_{source}$ ( $\Omega$ )	$Z_{in}$ ( $\Omega$ )	Max Output Power					
			P3dB					
			$Z_{load}^{(2)}$ ( $\Omega$ )	Gain (dB)	(dBm)	(W)	$\eta_D$ (%)	AM/PM ( $^\circ$ )
2110	4.10 – j7.99	3.65 + j8.53	2.19 – j5.39	14.6	55.8	381	58.7	–36
2140	5.10 – j7.80	4.67 + j8.73	2.25 – j5.25	15.0	55.8	380	60.1	–38
2170	6.30 – j6.90	6.15 + j8.47	2.20 – j5.20	15.1	55.7	374	59.2	–39
2200	7.30 – j5.00	8.03 + j7.02	2.24 – j5.17	15.3	55.7	374	59.9	–39

(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.

**Table 10. Peaking Side Load Pull Performance — Maximum Efficiency Tuning**

$V_{DD} = 28$  Vdc,  $V_{GSB} = 1.5$  Vdc, Pulsed CW, 10  $\mu$ sec(on), 10% Duty Cycle

f (MHz)	$Z_{source}$ ( $\Omega$ )	$Z_{in}$ ( $\Omega$ )	Max Drain Efficiency					
			P1dB					
			$Z_{load}^{(1)}$ ( $\Omega$ )	Gain (dB)	(dBm)	(W)	$\eta_D$ (%)	AM/PM ( $^\circ$ )
2110	4.10 – j7.99	3.08 + j7.95	4.17 – j3.64	18.3	53.9	244	68.3	–36
2140	5.10 – j7.80	3.75 + j8.13	4.08 – j3.16	18.7	53.6	230	68.8	–38
2170	6.30 – j6.90	4.71 + j8.12	3.79 – j2.66	18.9	53.3	213	69.1	–41
2200	7.30 – j5.00	6.12 + j7.45	3.39 – j2.70	19.0	53.4	217	69.4	–40

f (MHz)	$Z_{source}$ ( $\Omega$ )	$Z_{in}$ ( $\Omega$ )	Max Drain Efficiency					
			P3dB					
			$Z_{load}^{(2)}$ ( $\Omega$ )	Gain (dB)	(dBm)	(W)	$\eta_D$ (%)	AM/PM ( $^\circ$ )
2110	4.10 – j7.99	3.43 + j8.48	4.18 – j4.58	16.0	54.8	302	67.1	–41
2140	5.10 – j7.80	4.35 + j8.69	4.17 – j4.07	16.3	54.6	289	67.7	–43
2170	6.30 – j6.90	5.69 + j8.53	4.06 – j3.60	16.6	54.4	275	67.6	–46
2200	7.30 – j5.00	7.55 + j7.32	3.56 – j3.70	16.6	54.6	290	68.3	–44

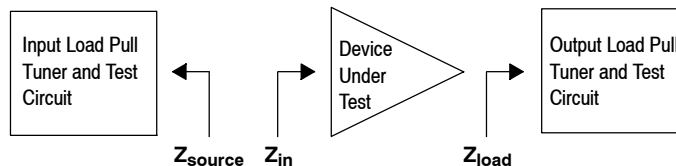
(1) Load impedance for optimum P1dB efficiency.

(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.





## P1dB – TYPICAL CARRIER SIDE LOAD PULL CONTOURS — 2140 MHz

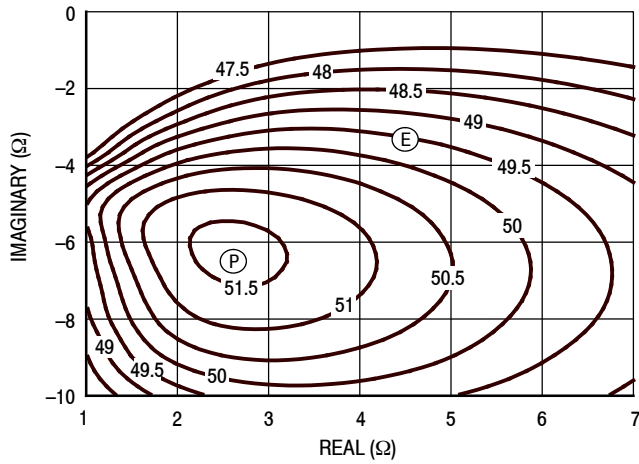


Figure 8. P1dB Load Pull Output Power Contours (dBm)

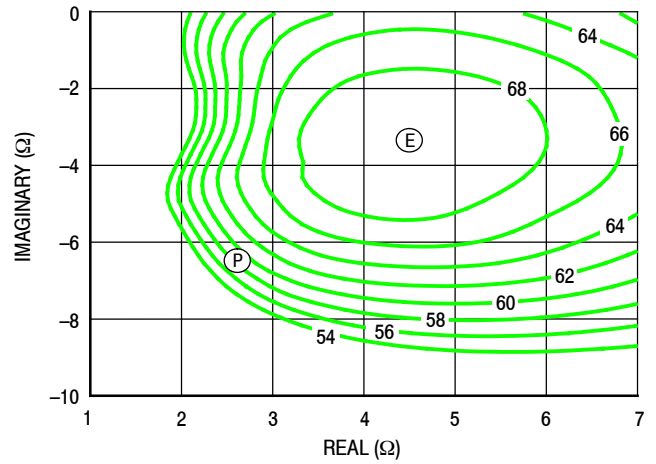


Figure 9. P1dB Load Pull Efficiency Contours (%)

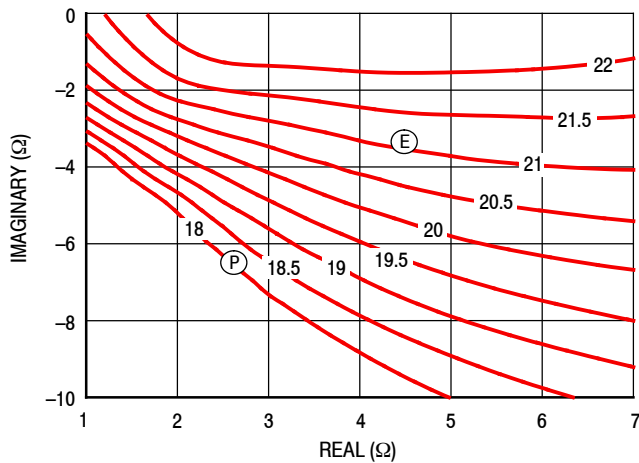


Figure 10. P1dB Load Pull Gain Contours (dB)

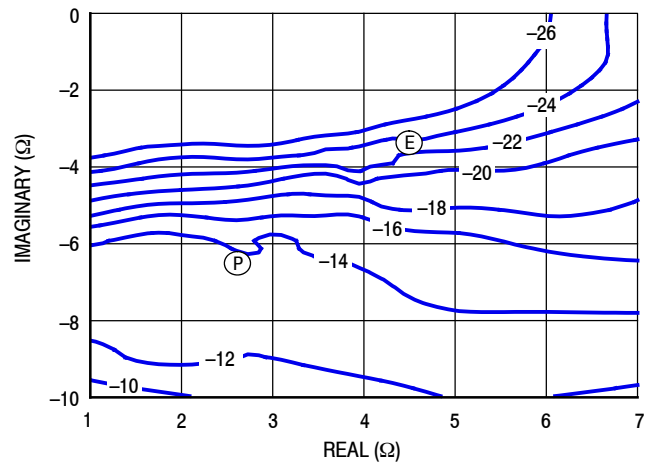


Figure 11. P1dB Load Pull AM/PM Contours (°)

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

- Gain
- Drain Efficiency
- Linearity
- Output Power

## P3dB – TYPICAL CARRIER SIDE LOAD PULL CONTOURS — 2140 MHz

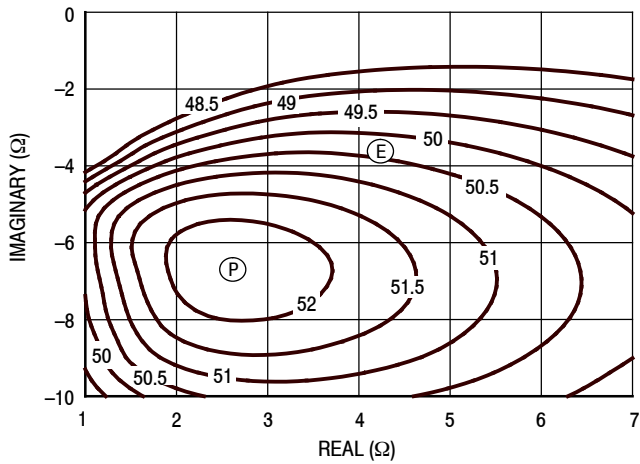


Figure 12. P3dB Load Pull Output Power Contours (dBm)

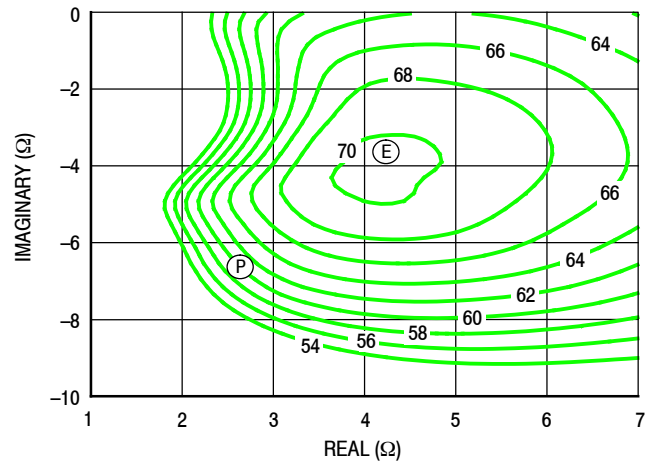


Figure 13. P3dB Load Pull Efficiency Contours (%)

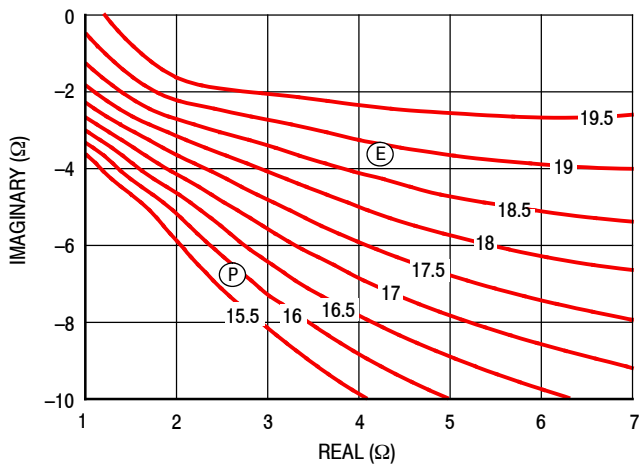


Figure 14. P3dB Load Pull Gain Contours (dB)

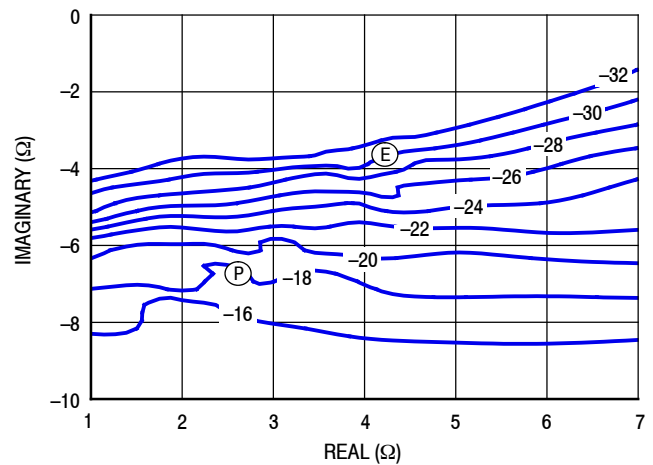


Figure 15. P3dB Load Pull AM/PM Contours (°)

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

- Gain
- Drain Efficiency
- Linearity
- Output Power

## P1dB – TYPICAL PEAKING SIDE LOAD PULL CONTOURS — 2140 MHz

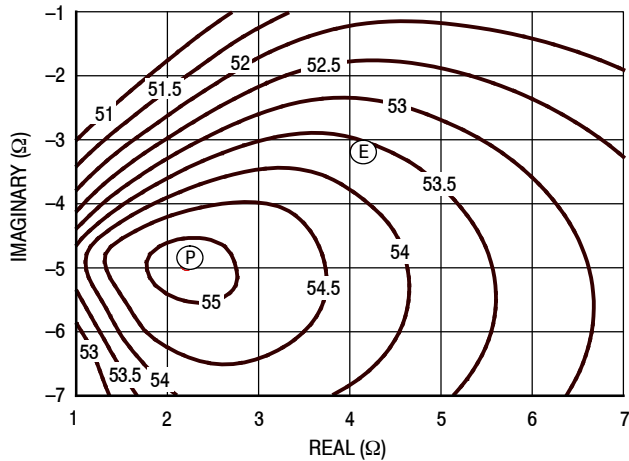


Figure 16. P1dB Load Pull Output Power Contours (dBm)

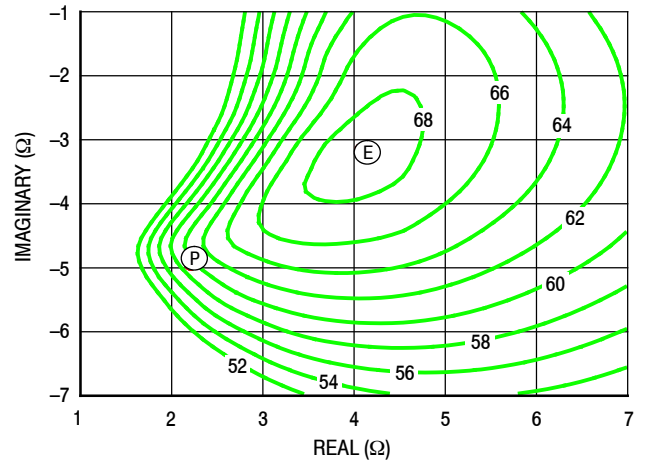


Figure 17. P1dB Load Pull Efficiency Contours (%)

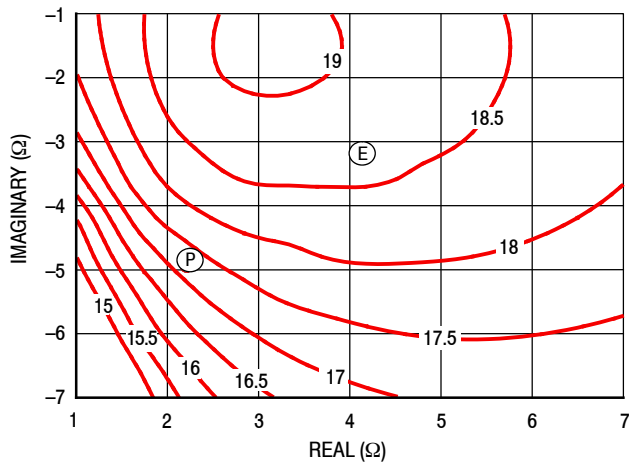


Figure 18. P1dB Load Pull Gain Contours (dB)

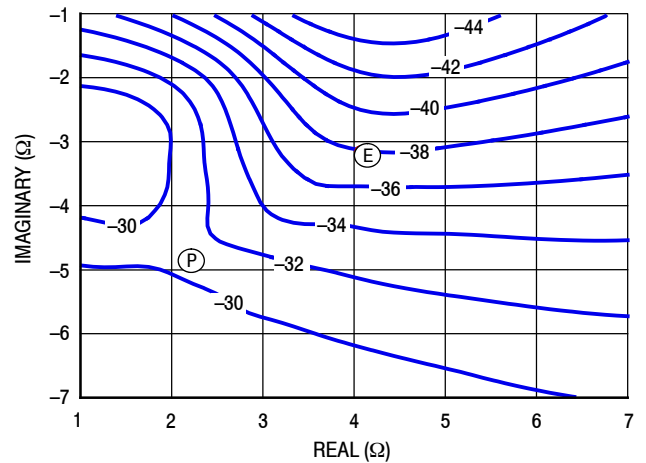


Figure 19. P1dB Load Pull AM/PM Contours (°)

**NOTE:** (P) = Maximum Output Power

(E) = Maximum Drain Efficiency

- Gain
- Drain Efficiency
- Linearity
- Output Power

### P3dB – TYPICAL PEAKING SIDE LOAD PULL CONTOURS — 2140 MHz

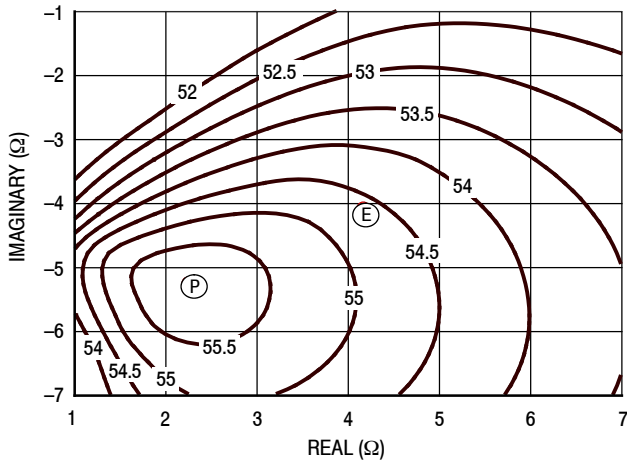


Figure 20. P3dB Load Pull Output Power Contours (dBm)

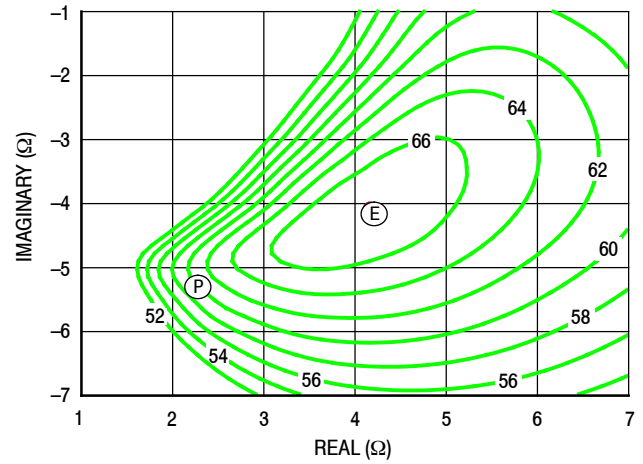


Figure 21. P3dB Load Pull Efficiency Contours (%)

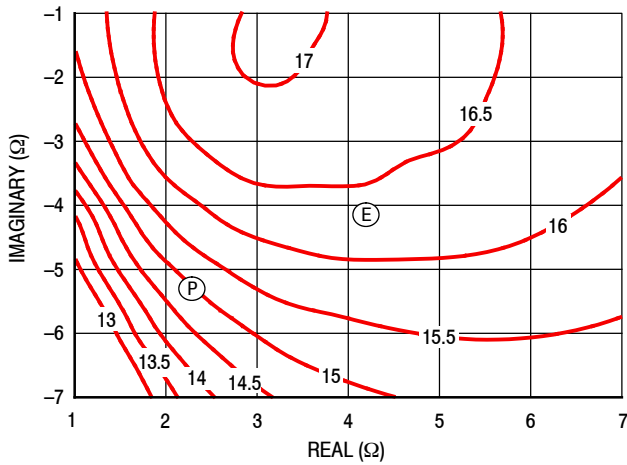


Figure 22. P3dB Load Pull Gain Contours (dB)

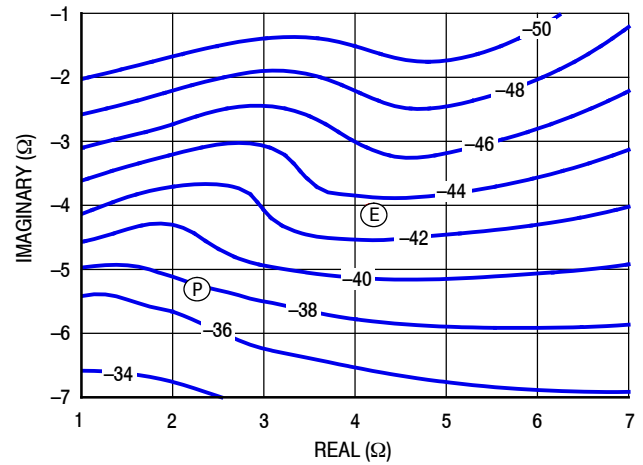
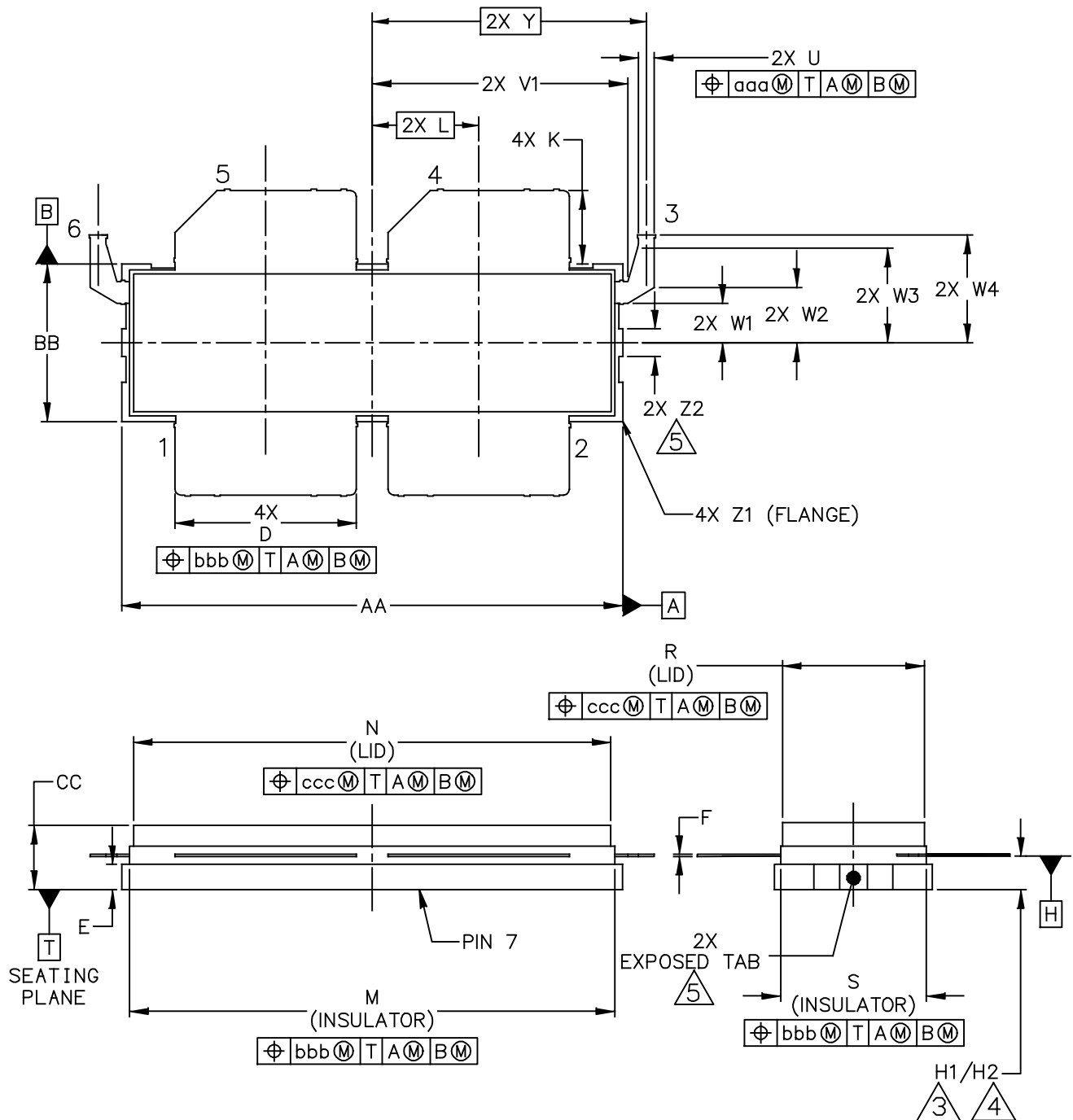


Figure 23. P3dB Load Pull AM/PM Contours (°)

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

- Gain
- Drain Efficiency
- Linearity
- Output Power

### PACKAGE DIMENSIONS



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TITLE:  ACP-1230S-4L2S	DOCUMENT NO: 98ASA00974D STANDARD: NON-JEDEC SOT1800-4	REV: A  21 JUN 2017

A3T21H360W23SR6

NOTES:

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

2. CONTROLLING DIMENSION: INCH

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

4. TOLERANCE OF DIMENSION H2 IS TENTATIVE.

5. THESE SURFACES OF THE HEAT SLUG ARE NOT PART OF THE SOLDERABLE SURFACES AND MAY REMAIN UNPLATED.

6. DATUM H IS LOCATED AT THE BOTTOM OF THE LEAD FRAME AND IS COINCIDENT WITH THE LEAD WHERE THE LEADS EXIT THE PLASTIC BODY.

7. DIMENSIONS M AND S DO NOT INCLUDE MOLD PROTRUSION. ALLOWABLE PROTRUSION IS .012 INCH (0.30 MM) PER SIDE. DIMENSIONS M AND S DO INCLUDE MOLD MISMATCH AND ARE DETERMINED AT DATUM PLANE H.

8. DIMENSIONS D, U AND K DO NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE .010 INCH (0.25 MM) TOTAL IN EXCESS OF THE D, U AND K DIMENSION AT MAXIMUM MATERIAL CONDITION.

9. DATUM A AND B TO BE DETERMINED AT DATUM T.

DIM	INCHES		MILLIMETERS		DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX		MIN	MAX	MIN	MAX
AA	1.265	1.275	32.13	32.39	S	.365	.375	9.27	9.53
BB	.395	.405	10.03	10.29	U	.035	.045	0.89	1.14
CC	.160	.190	4.06	4.83	V1	.640	.655	16.26	16.64
D	.455	.465	11.56	11.81	W1	.105	.115	2.67	2.92
E	.062	.069	1.57	1.75	W2	.135	.145	3.43	3.68
F	.004	.007	0.10	0.18	W3	.245	.255	6.22	6.48
H1	.082	.090	2.08	2.29	W4	.265	.281	6.73	7.14
H2	.078	.094	1.98	2.39	Y	0.695 BSC		17.65 BSC	
K	.175	.195	4.45	4.95	Z1	R.000	R.040	R0.00	R1.02
L	0.270 BSC		6.86 BSC		Z2	.060	.100	1.52	2.54
M	1.219	1.241	30.96	31.52	aaa	.015		0.38	
N	1.218	1.242	30.94	31.55	bbb	.010		0.25	
R	.365	.375	9.27	9.53	ccc	.020		0.51	

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MECHANICAL OUTLINE

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TITLE:

ACP-1230S-4L2S

DOCUMENT NO: 98ASA00974D

REV: A

STANDARD: NON-JEDEC

SOT1800-4

21 JUN 2017

## PRODUCT DOCUMENTATION, SOFTWARE AND TOOLS

Refer to the following resources to aid your design process.

### Application Notes

- AN1908: Solder Reflow Attach Method for High Power RF Devices in Air Cavity Packages
- 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

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

1. Go to <http://www.nxp.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	Aug. 2017	<ul style="list-style-type: none"><li>• Initial release of data sheet</li></ul>

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