

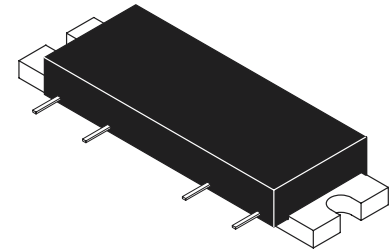
The RF Line  
**UMTS Band**  
**RF Linear LDMOS Amplifier**

Designed for Class AB amplifier applications in 50 ohm systems operating in the UMTS frequency band. A silicon FET design provides outstanding linearity and gain. In addition, the excellent group delay and phase linearity characteristics are ideal for digital modulation systems.

- Typical W-CDMA Performance for  $V_{DD} = 28$  Volts,  $V_{bias} = 8$  Volts,  $I_{DQ} = 550$  mA, Channel Bandwidth = 3.84 MHz, Adjacent Channels at  $\pm 5$  MHz, ACPR Measured in 3.84 MHz Bandwidth. Peak/Avg. = 8.5 dB @ 0.01% Probability on CCDF, 3GPP Test Model 1, 64 DTCH.
- Adjacent Channel Power: -50 dBc @ 30 dBm, 5 MHz Channel Spacing
- Power Gain: 23.7 dB Min (@  $f = 2140$  MHz)
- Excellent Phase Linearity and Group Delay Characteristics
- 0.2 dB Typical Gain Flatness
- Ideal for Feedforward Base Station Applications

**MHPA21010**

**2110–2170 MHz**  
**10 W, 23.7 dB**  
**RF HIGH POWER LDMOS AMPLIFIER**



CASE 301AP-02, STYLE 3

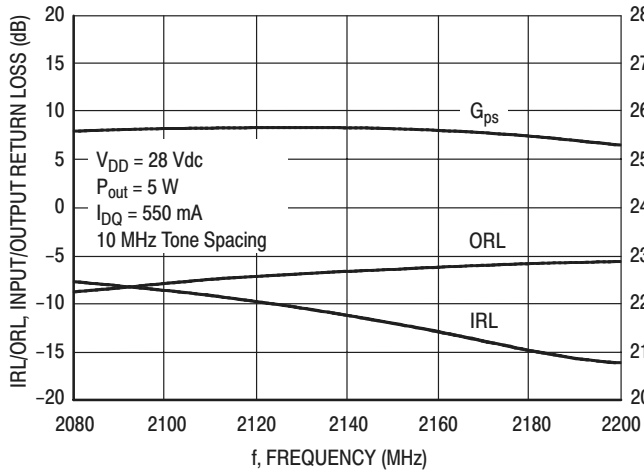
**MAXIMUM RATINGS** ( $T_C = 25^\circ\text{C}$  unless otherwise noted)

Rating	Symbol	Value	Unit
DC Supply Voltage	$V_{DD}$	30	Vdc
RF Input Power (Single Carrier CW)	$P_{in}$	+20	dBm
Storage Temperature Range	$T_{stg}$	-40 to +100	$^\circ\text{C}$
Operating Case Temperature Range	$T_C$	-20 to +100	$^\circ\text{C}$
Quiescent Bias Current	$I_{DQ}$	750	mA

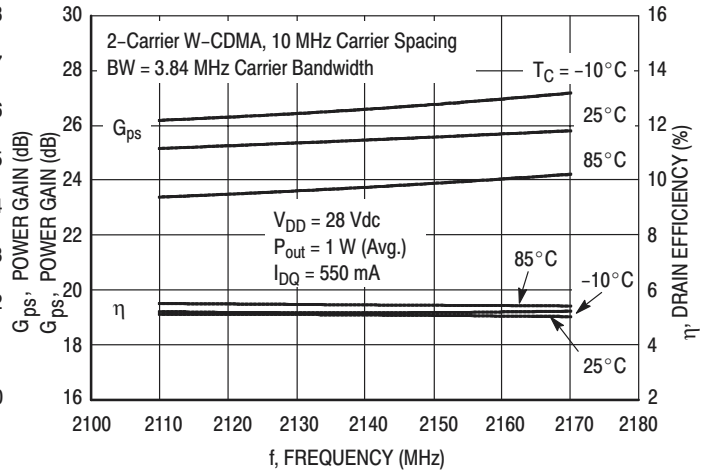
**ELECTRICAL CHARACTERISTICS** ( $V_{DD} = 28$  Vdc,  $V_{BIAS} \cong 8$  V Set for Supply Current of 550 mA,  $T_C = 25^\circ\text{C}$ , 50  $\Omega$  System)

Characteristic	Symbol	Min	Typ	Max	Unit
Supply Current	$I_{DD}$	—	550	—	mA
Power Gain (f = 2140 MHz)	$G_p$	23.7	25	—	dB
Gain Flatness (f = 2110–2170 MHz)	$G_F$	—	0.2	0.6	dB
Power Output @ 1 dB Comp. (f = 2140 MHz)	$P_{1dB}$	—	41.5	—	dBm
Input VSWR (f = 2110–2170 MHz)	$VSWR_{in}$	—	1.5:1	2:1	
Noise Figure (f = 2140 MHz)	NF	—	—	10	dB
Adjacent Channel Power Rejection @ 30 dBm Avg., 3.84 MHz BW, 5 MHz Channel Spacing	ACPR	—	-55	-50	dBc

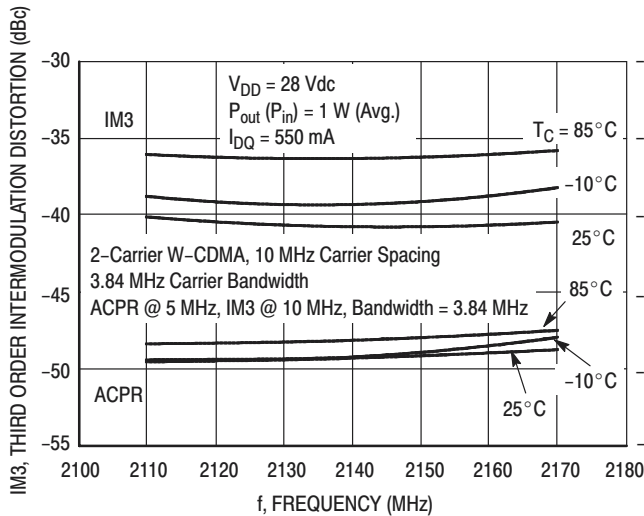
## TYPICAL CHARACTERISTICS



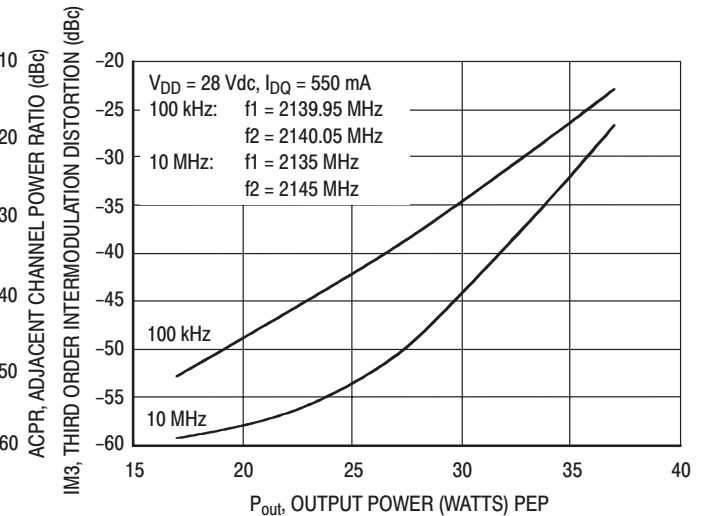
**Figure 1. Two-Tone Power Gain, Input Return Loss and Output Return Loss versus Frequency**



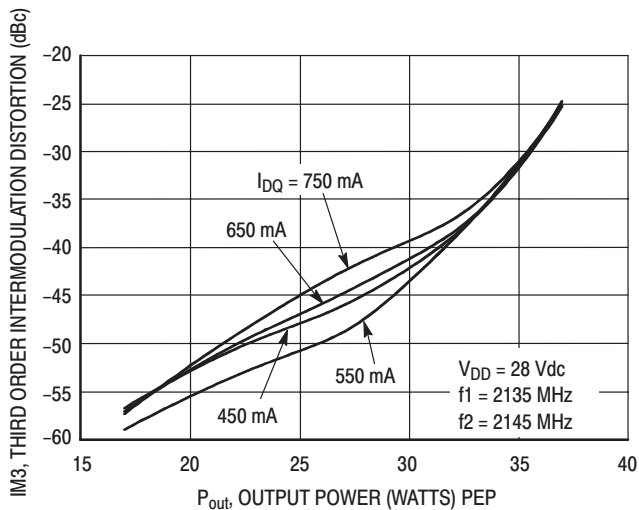
**Figure 2. 2-Carrier W-CDMA Power Gain and Efficiency versus Frequency**



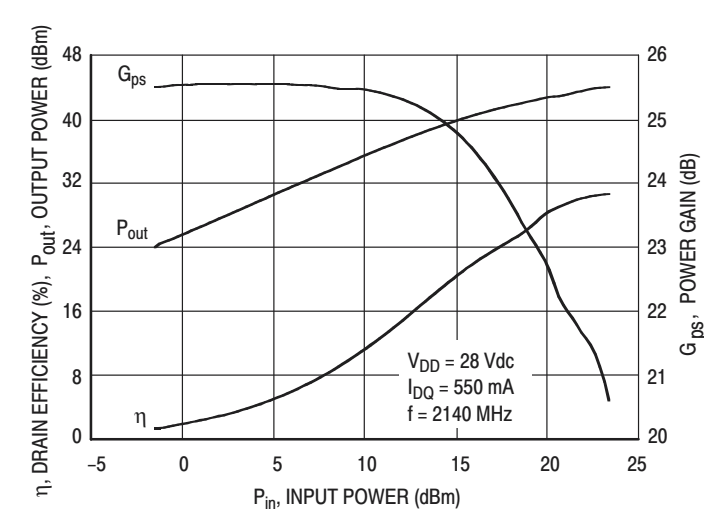
**Figure 3. 2-Carrier W-CDMA IM3 and ACPR versus Frequency**



**Figure 4. Two-Tone W-CDMA IM3 versus Output Power**

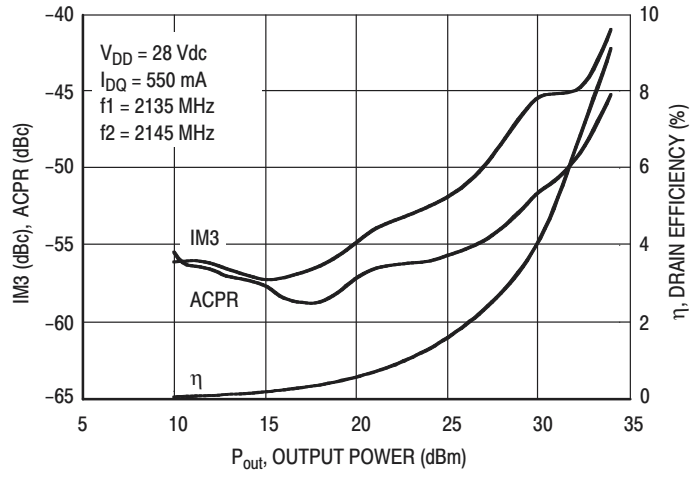


**Figure 5. Third Order Intermodulation Distortion versus Output Power**



**Figure 6. CW Output Power, Efficiency and Gain versus Input Power**

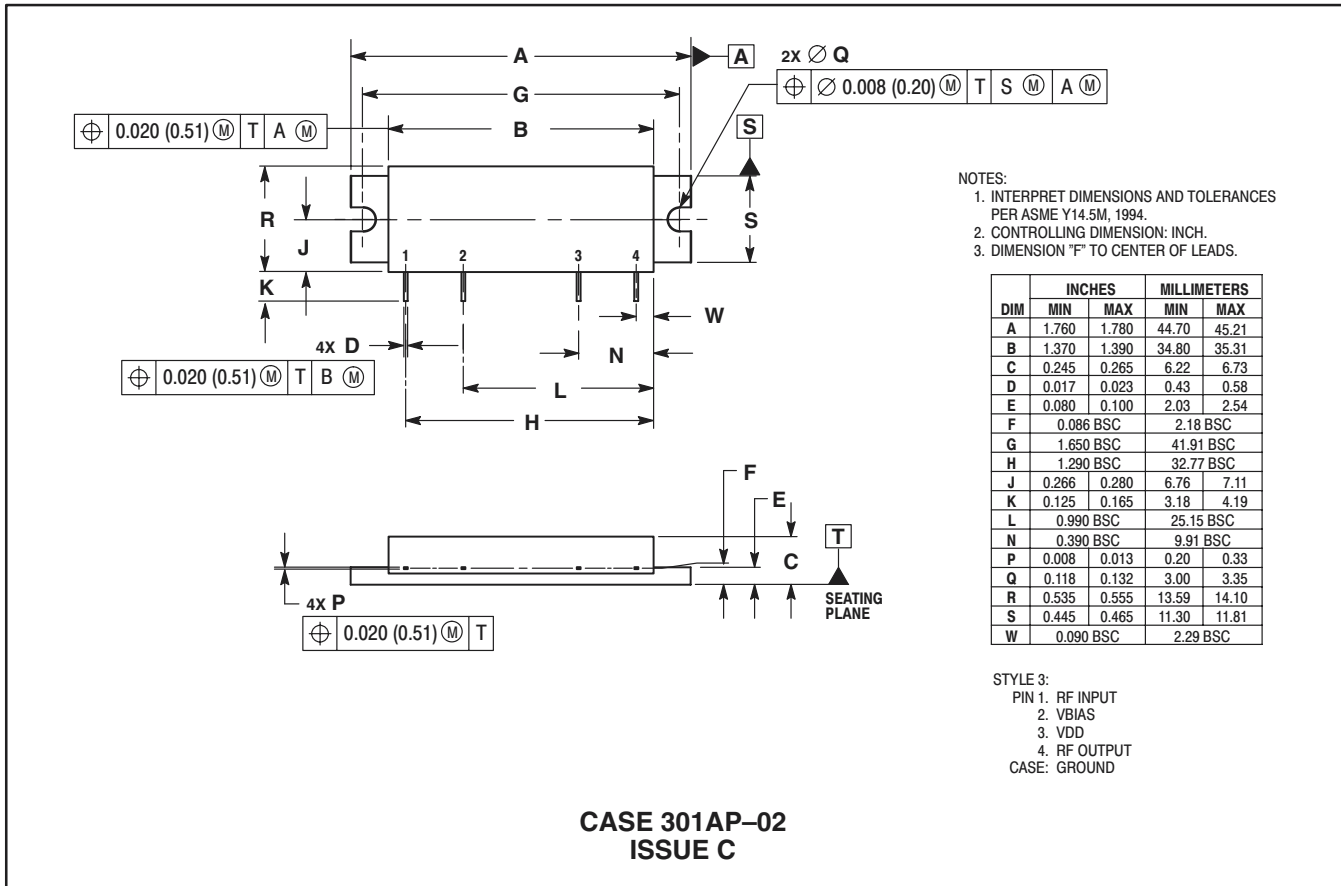
**Freescale Semiconductor, Inc.**



**Figure 7. 2-Carrier W-CDMA ACPR, IM3 and Efficiency versus Output Power**

# Freescale Semiconductor, Inc.

## PACKAGE DIMENSIONS



NOTE:  $V_{DD}$  (Pin 3) should always be applied before  $V_{BIAS}$  (Pin 2).

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