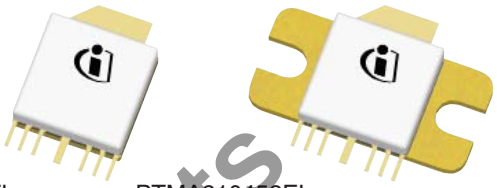
PTMA210452EL
PTMA210452FL

green Product

Wideband RF LDMOS Integrated Power Amplifier 45 W, 1900 – 2200 MHz

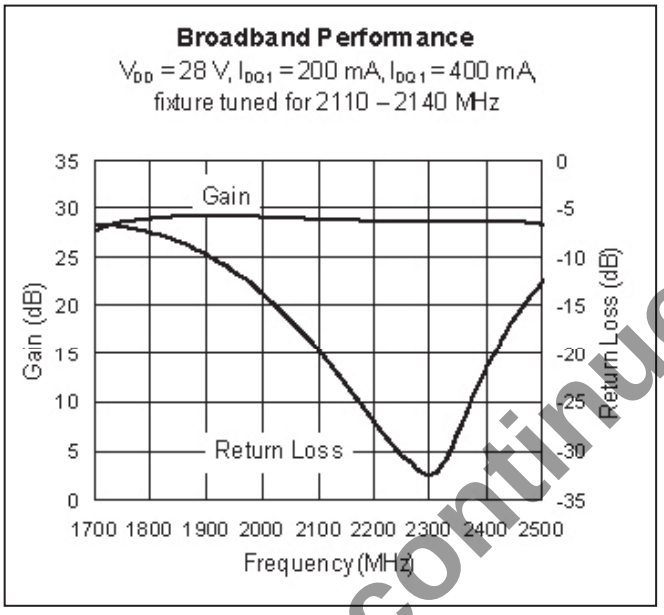
Description

The PTMA210452FL and PTMA210452FL are wideband, 45-watt, 2-stage, LDMOS integrated amplifiers intended for use in all typical modulation formats from 1900 to 2200 MHz. These devices are offered in thermally-enhanced ceramic packages with solder-friendly plating for cool and reliable operation.



PTMA210452FL
Package H-34265-8

PTMA210452EL
Package H-33265-8



Features

- Designed for wide RF and modulation bandwidths and low memory effects
- Typical two-carrier WCDMA performance at 2140 MHz, 28 V
  - Average output power = 3.2 W
  - Linear Gain = 28 dB
  - Efficiency = 10.5%
  - IMD3 = –47 dBc
- Typical two-tone performance, 2140 MHz, 28 V
  - Output power (PEP) = 45 W at IM3 = –30 dBc
  - Efficiency = 32%
- Capable of handling 10:1 VSWR @ 28 V, 45 W (CW) output power
- Integrated ESD protection. Meets HBM Class 1B (minimum), per JESD22-A114F
- Thermally-enhanced packages, Pb-free and RoHS compliant, with solder-friendly plating

RF Characteristics

Two-carrier WCDMA Measurements (tested in Infineon test fixture)

V_{DD} = 28 V, I_{DQ1} = 200 mA (tuned for linearity), I_{DQ2} = 450 mA (tuned for linearity & efficiency), P_{OUT} = 3.2 W average, $f1$ = 2135 MHz, $f2$ = 2145 MHz, 3GPP signal, channel bandwidth = 3.84 MHz, peak/average = 8 dB @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Input Return Loss	IRL	—	–16	–10	dB
Gain	G_{ps}	26.5	28	—	dB
Drain Efficiency	η_D	9	10.5	—	%
Intermodulation Distortion, 2-channel WCDMA	IMD	–43	–47	—	dBc

All published data at T_{CASE} = 25°C unless otherwise indicated

ESD: Electrostatic discharge sensitive device—observe handling precautions!

RF Characteristics

Small-signal CW Measurements (not subject to production test—verified by design/characterization in Infineon test fixture)
V_{DD} = 28 V, I_{DQ1} = 200 mA, I_{DQ2} = 450 mA, P_{OUT} = 1 W, f = 2140 MHz

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Gain Flatness	1 W / 30 MHz	ΔG	—	0.10	0.5	dB
Phase Linearity		—	–1	+0.6	+1	°/60 MHz
Group Delay	f = 2140 MHz	td	—	2.16	—	ns

DC Characteristics

Stage 1 Characteristics	Conditions	Symbol	Min	Typ	Max	Unit
Drain Leakage Current	V_{DS} = 28 V, V_{GS} = 0 V	I_{DSS}	—	—	1.0	µA
	V_{DS} = 63 V, V_{GS} = 0 V	I_{DSS}	—	—	10.0	µA
Gate Leakage Current	V_{GS} = 10 V, V_{DS} = 0 V	I_{GSS}	—	—	1.0	µA
On-state Resistance	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	1.1	—	Ω
Operating Gate Voltage	V_{DS} = 28 V, I_{DQ1} = 200 mA,	V_{GS}	2.0	2.5	3.0	V

Stage 2 Characteristics	Conditions	Symbol	Min	Typ	Max	Unit
Drain-source Breakdown Voltage	V_{GS} = 0 V, I_{DS} = 10 mA	$V_{(BR)DSS}$	65	—	—	V
Drain Leakage Current	V_{DS} = 28 V, V_{GS} = 0 V	I_{DSS}	—	—	1.0	µA
	V_{DS} = 63 V, V_{GS} = 0 V	I_{DSS}	—	—	10.0	µA
Gate Leakage Current	V_{GS} = 10 V, V_{DS} = 0 V	I_{GSS}	—	—	1.0	µA
On-state Resistance	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	0.16	—	Ω
Operating Gate Voltage	V_{DS} = 28 V, I_{DQ2} = 450 mA	V_{GS}	2.0	2.5	3.0	V

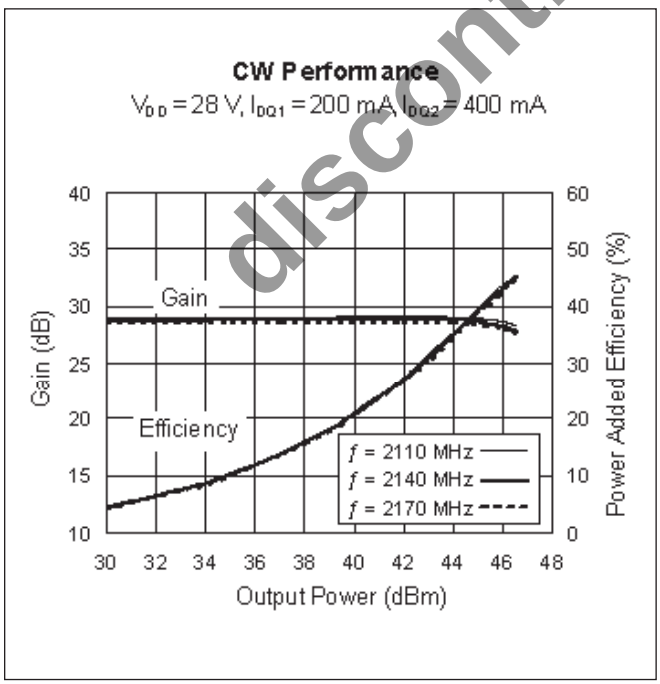
Maximum Ratings

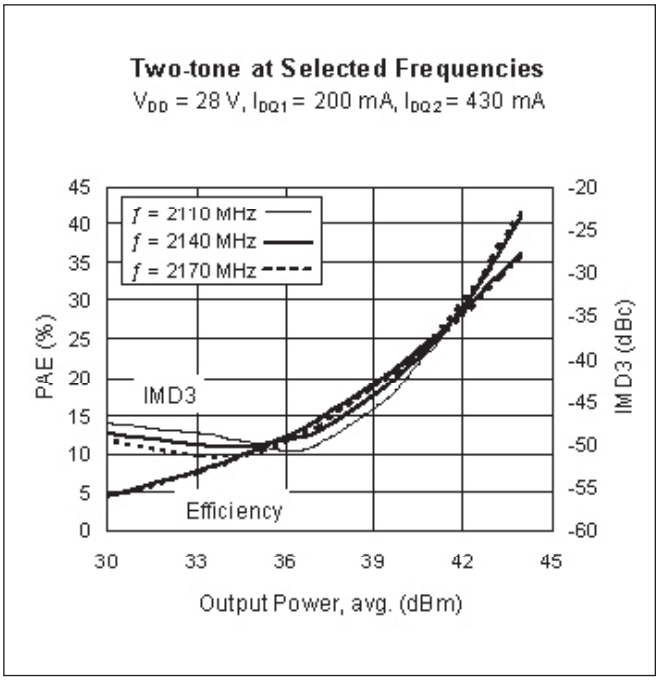
Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	65	V
Gate-Source Voltage		V_{GS}	–0.5 to +12	V
Junction Temperature		T_J	200	°C
Input Power		P_{IN}	25	dBm
Storage Temperature Range		T_{STG}	–40 to +150	°C
Thermal Resistance (T_{CASE} = 70°C)	Stage 1	$R_{\theta JC}$	3.5	°C/W
	Stage 2	$R_{\theta JC}$	1.3	°C/W

Ordering Information

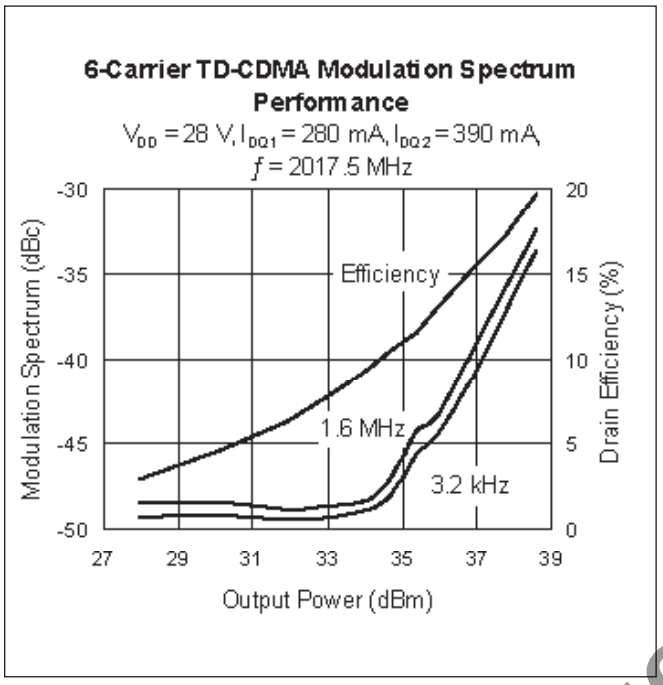
Type and Version	Package Outline	Package Description	Shipping
PTMA210452EL V1	H-33265-8	Thermally-enhanced slotted flange	Tray
PTMA210452EL V1 R250	H-33265-8	Thermally-enhanced slotted flange	Tape & Reel
PTMA210452FL V1	H-34265-8	Thermally-enhanced earless flange	Tray
PTMA210452FL V1 R250	H-34265-8	Thermally-enhanced earless flange	Tape & Reel

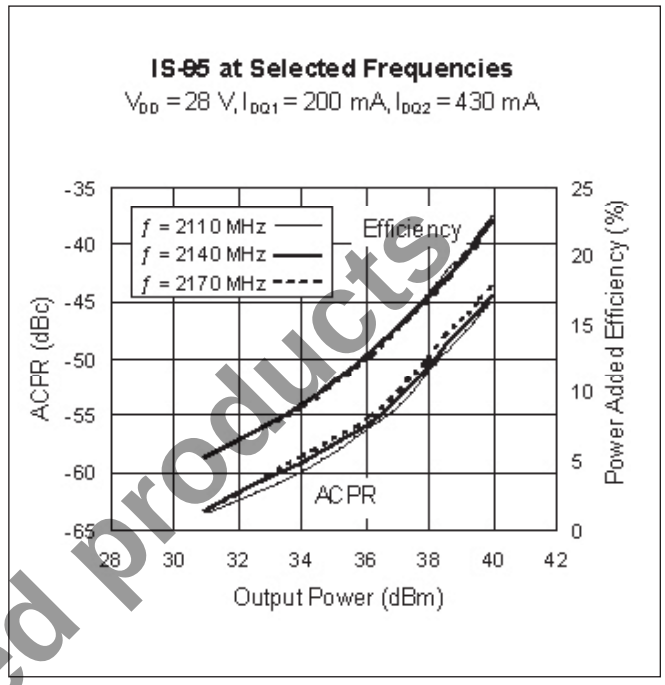
Typical Performance (data taken in a production test fixture)

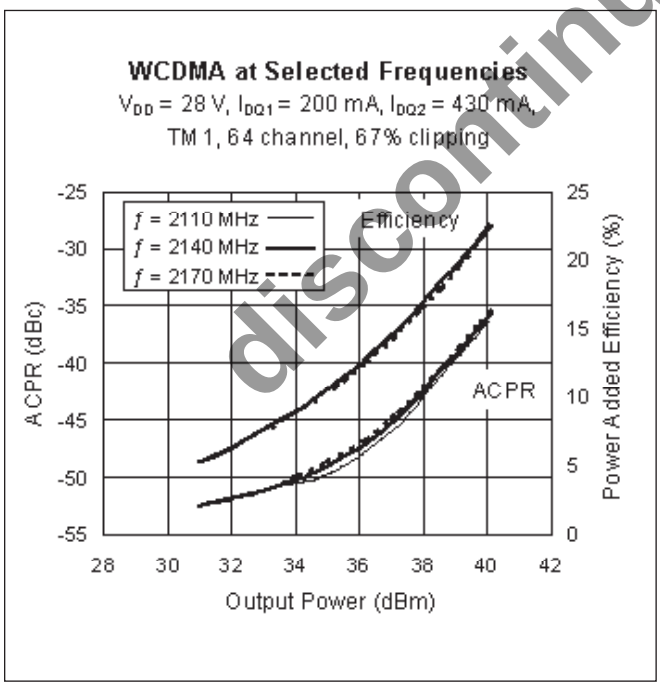


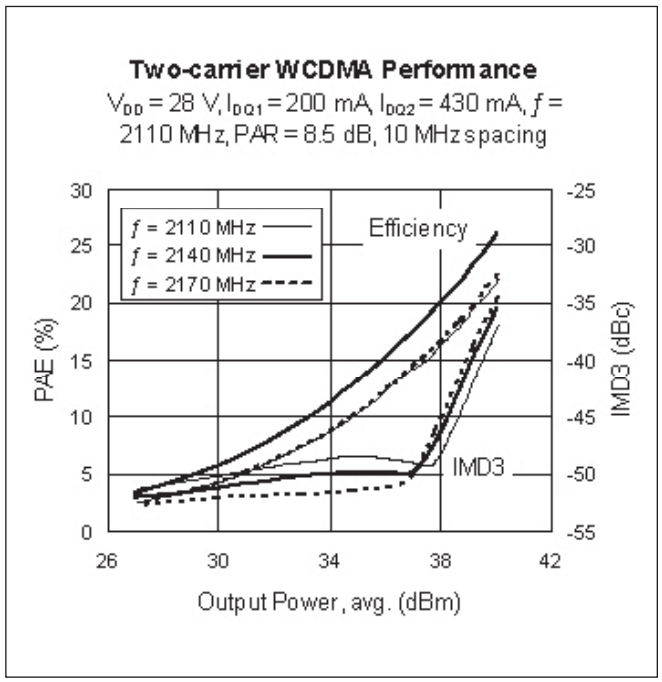


Typical Performance (cont.)

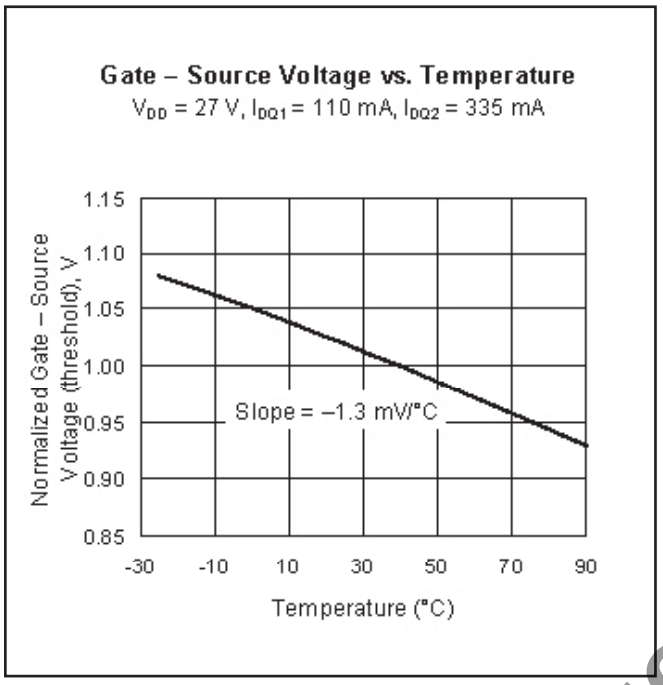




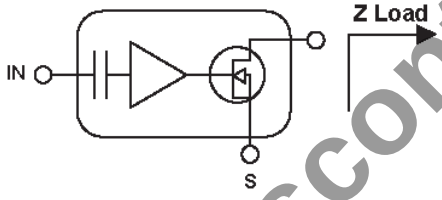




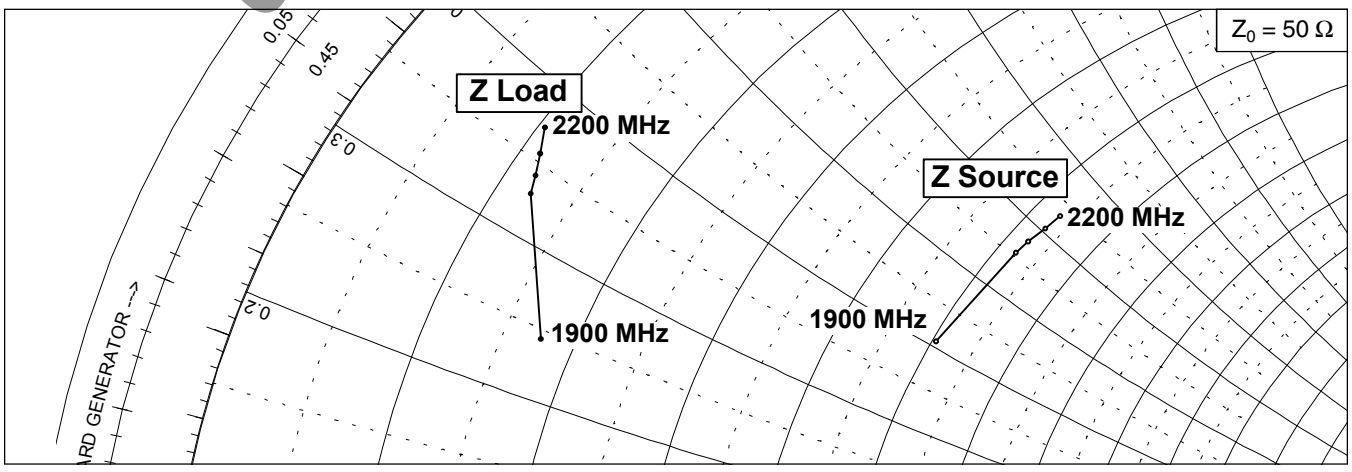
Typical Performance (cont.)



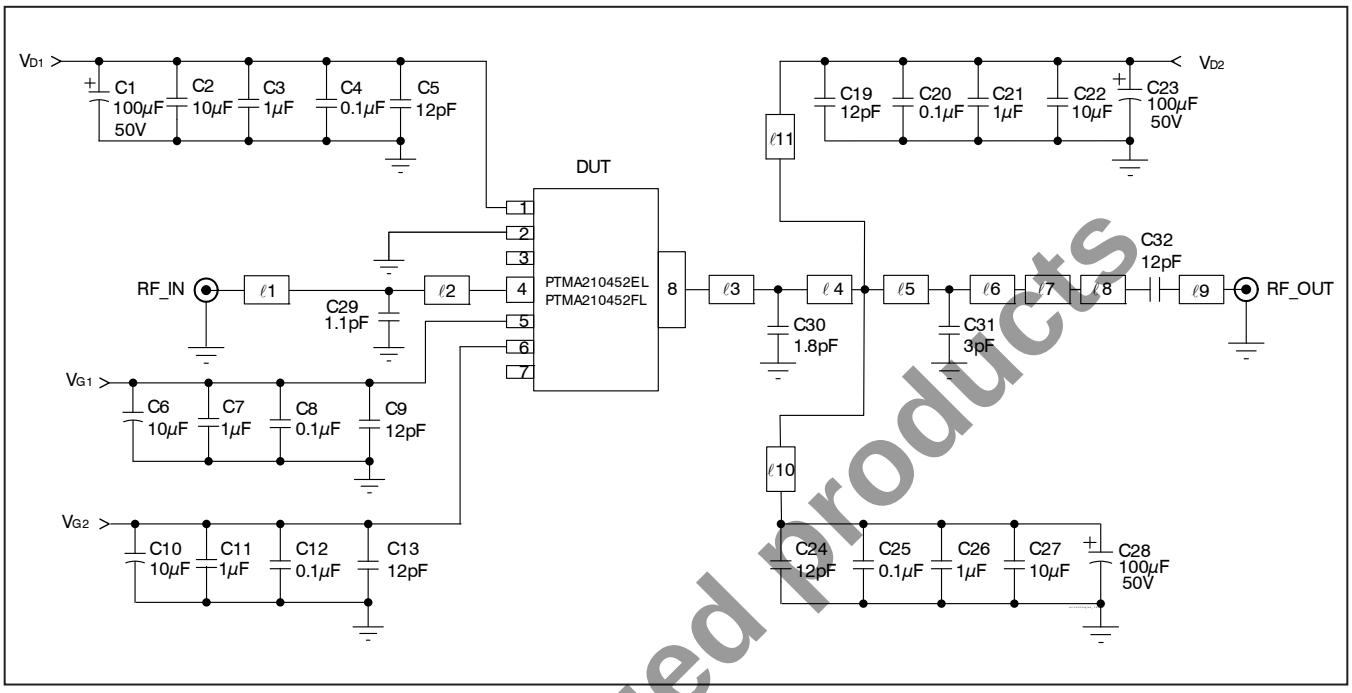
Broadband Circuit Impedance



Frequency	Z Source Ω		Z Load Ω	
MHz	R	jX	R	jX
1900	25.2	20.4	8.8	12.2
2110	26.1	27.8	6.1	16.5
2140	26.2	28.9	5.9	17.1
2170	26.5	30.3	5.6	17.8
2200	26.6	31.6	5.2	18.6



Reference Circuit — for evaluation only



Reference circuit schematic for ƒ = 2140 MHz

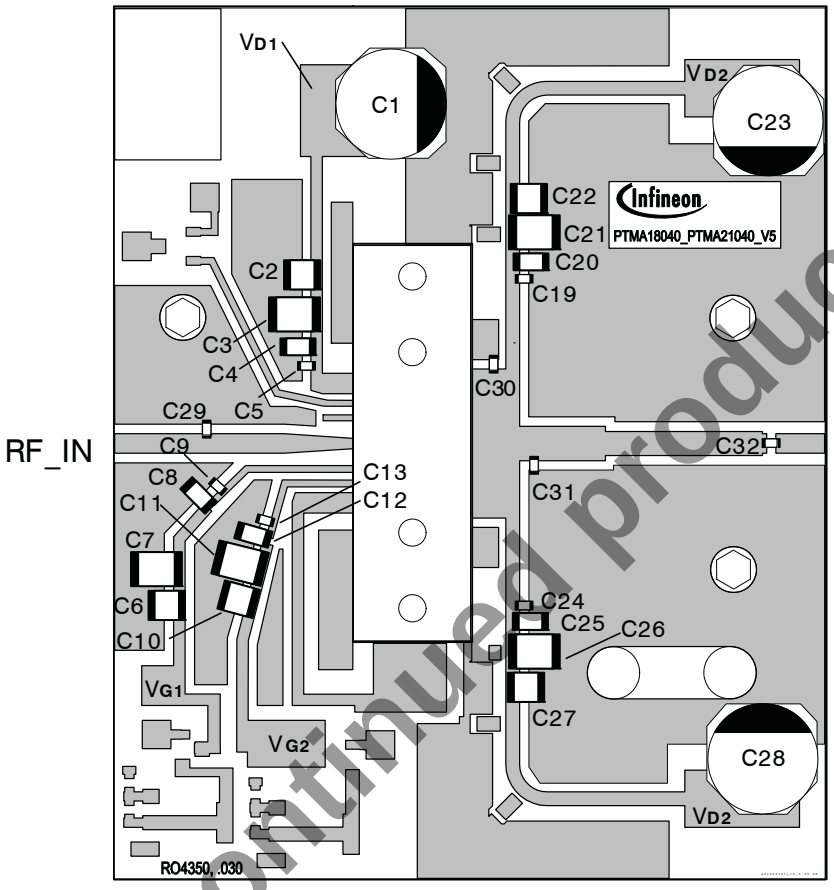
Circuit Assembly Information

DUT	PTMA210452EL or PTMA210452FL	RF LDMOS Integrated Power Amplifier ICs
Test Fixture Part No.	LTN/PTMA210452	
PCB	Rogers RO4350	ε_r = 3.48, 0.76 mm [.030"] thick, 1 oz. copper

Find Gerber files for this test fixture on the Infineon Web site at **http://www.infineon.com/rfpower**

Microstrip	Electrical Characteristics at 2140 MHz	Dimensions: L x W (mm)	Dimensions: L x W (in.)
ℓ1	0.129 λ, 49.7 Ω	11.00 x 1.70	0.433 x 0.067
ℓ2	0.114 λ, 49.7 Ω	9.68 x 1.70	0.381 x 0.067
ℓ3	0.040 λ, 10.4 Ω	3.10 x 13.00	0.122 x 0.512
ℓ4	0.013 λ, 10.4 Ω	1.02 x 13.00	0.039 x 0.512
ℓ5	0.024 λ, 34.1 Ω	2.01 x 3.00	0.079 x 0.118
ℓ6	0.066 λ, 34.1 Ω	5.46 x 3.00	0.215 x 0.118
ℓ7	0.162 λ, 43.4 Ω	13.67 x 2.11	0.538 x 0.083
ℓ8	0.004 λ, 49.7 Ω	0.38 x 1.70	0.015 x 0.067
ℓ9	0.050 λ, 49.7 Ω	4.24 x 1.70	0.167 x 0.067
ℓ10, ℓ11	0.128 λ, 61.2 Ω	11.00 x 1.19	0.433 x 0.047

Reference Circuit (cont.)



Reference circuit assembly diagram (not to scale)

Circuit Assembly Table

Component	Description	Suggested Supplier	P/N or Comment
C1, C23, C28	Electrolytic capacitor 100 µF, 50 V	Digi-Key	PCE3718CT-ND
C2, C6, C10, C22, C27	Ceramic capacitor 10 µF	Murata	GRM422Y5V106Z050AL
C3, C7, C11, C21, C26	Ceramic capacitor 1 µF	Digi-Key	445-1411-2-ND
C4, C8, C12, C20, C25	Capacitor, 0.1 µF	Digi-Key	399-1267-2-ND
C5, C9, C13, C19, C24, C32	Ceramic capacitor 12 pF	ATC	600S120JT
C29	Ceramic capacitor 1.1 pF	ATC	600S1R1BT
C30	Ceramic capacitor 1.8 pF	ATC	600S1R8BT
C31	Ceramic capacitor 3 pF	ATC	600S3R0BT
Not used	C14, C15, C16, C17, C18		

Package Specifications

Package H-33265-8 Outline

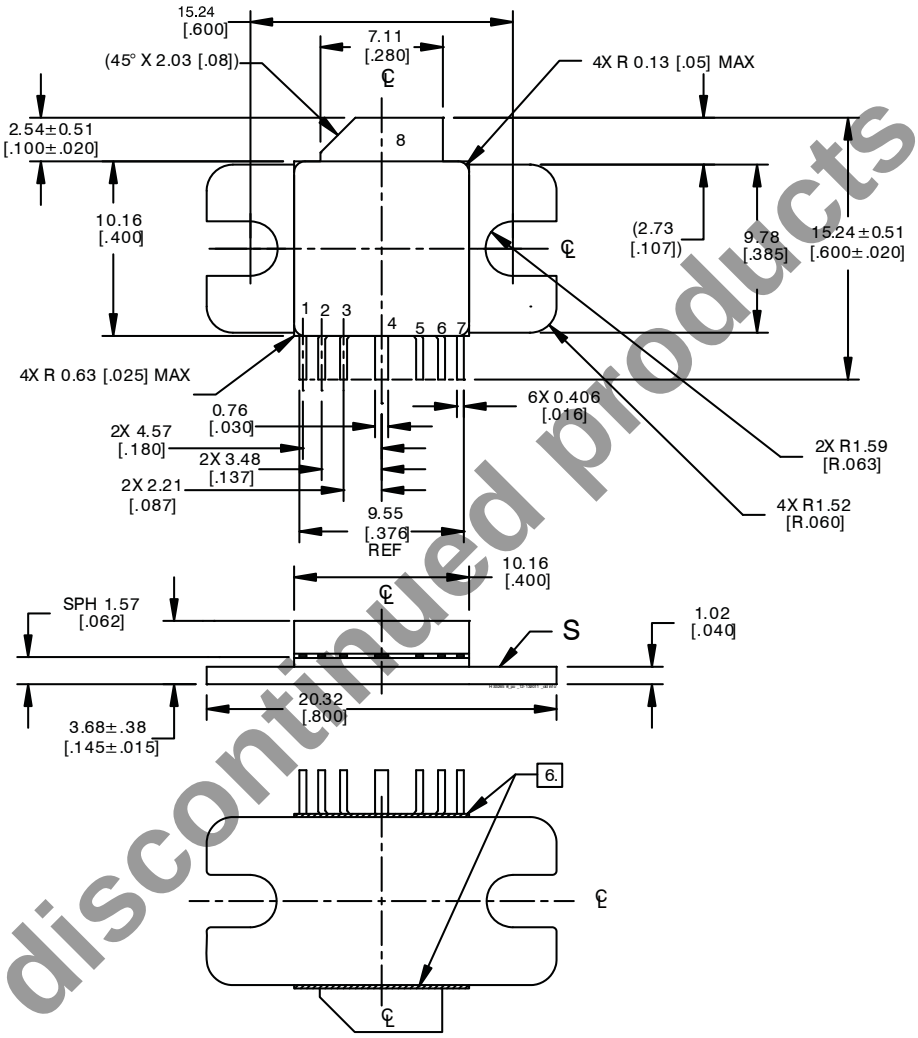
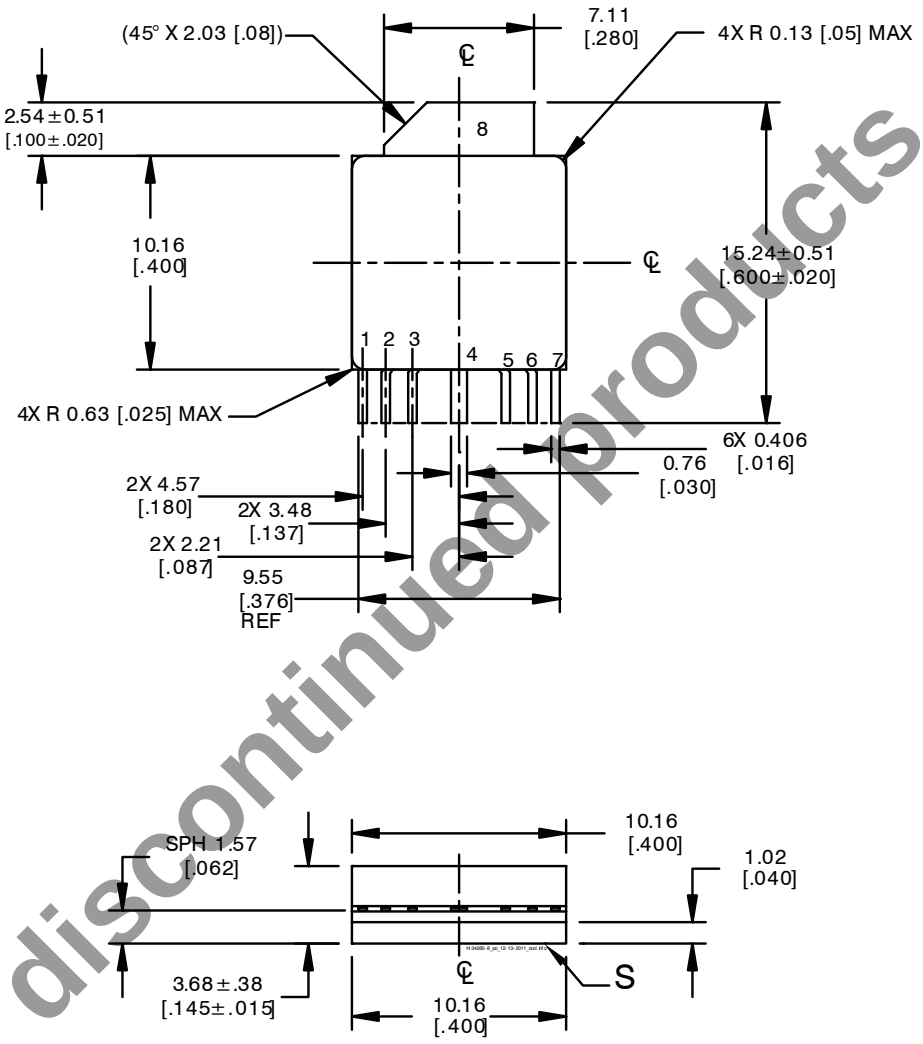


Diagram Notes—unless otherwise specified:

1. Interpret dimensions and tolerances per ASME Y14.5M-1994.
2. Pins: see page 10 for complete list and pinout diagram.
3. Lead thickness: 0.127 ± 0.025 [0.005 ± 0.001].
4. Gold plating less than 0.25 micron [10 microinch].
5. All tolerances ± 0.127 [0.005] unless specified otherwise.
6. Exposed metal plane on bottom of ceramic insulator.
7. Primary dimensions are inches, alternate dimensions are mm.

Package Specifications (cont.)

Package H-34265-8 Outline



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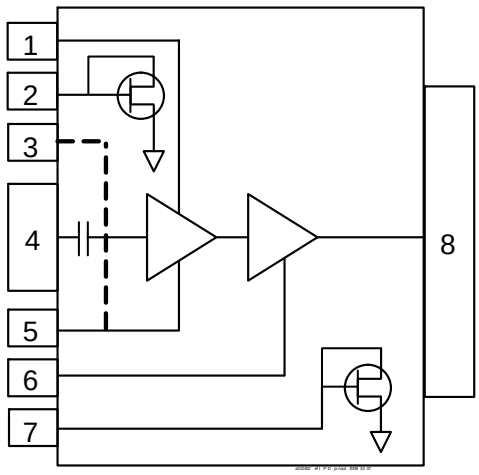
5. All tolerances ± 0.127 [0.005] unless specified otherwise.
6. Primary dimensions are inches, alternate dimensions are mm.

Package Specifications (cont.)

Package H-3X265-8 Pinout



Pin #	Function
S (Flange)	Source
1	V_{D1}
2	V_{G1} thermal FET
3	V_{G1}
4	RF In
5	V_{G1}
6	V_{G2}
7	V_{G2} thermal FET
8	RF Out

Find the latest and most complete information about products and packaging at the Infineon Internet page
http://www.infineon.com/rfpower

Revision History: 2015-01-14	Data Sheet
Previous Version: 2011-11-10, Data Sheet	
Page	Subjects (major changes since last revision)
All	Products discontinued. Please see PD Notes: PD_215_14.

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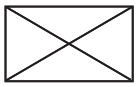

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