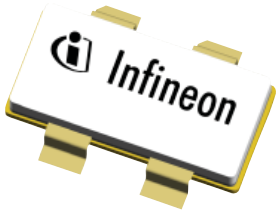
green Product

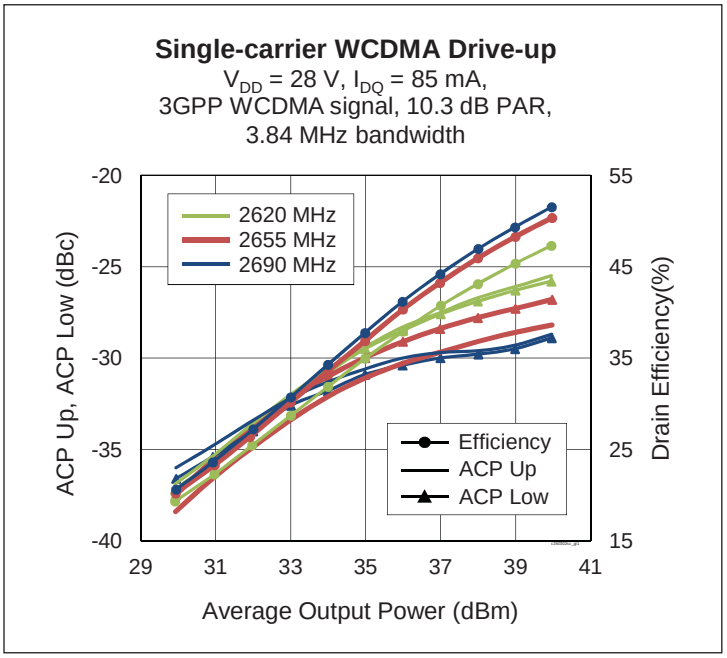
Thermally-Enhanced High Power RF LDMOS FET
30 W, 28 V, 2620 – 2690 MHz

Description

The PTAC260302SC is a 30-watt LDMOS FET intended for use in multi-standard cellular power amplifier applications in the 2620 to 2690 MHz frequency band. This device integrates a 10-W (main) and a 20-W (peak) transistor, making it ideal for asymmetric Doherty amplifier designs. Features include input matching, high gain and thermally-enhanced package with earless flange. Manufactured with Infineon's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.



PTAC260302SC
Package H-37248H-4 (formed leads)



Features

- Asymmetrical design
- Input matching
- Wide video bandwidth
- Typical CW performance, 2690 MHz, 28 V (Doherty configuration)
  - Output power at P_{3dB} = 31 W
  - Efficiency = 56%
  - Gain = 12 dB
- Typical single-carrier WCDMA performance, 2690 MHz, 28 V (Doherty configuration)
  - Output power = 37.5 dBm avg
  - Gain = 15 dB
  - Efficiency = 45%
  - IMD = –29 dBc
- Capable of handling 10:1 VSWR at 30 V, 30 W (CW) output power
- Integrated ESD protection
- Pb-free and RoHS compliant

RF Characteristics

Single-carrier WCDMA Specifications (tested in Infineon Doherty test fixture)
V_{DD} = 28 V, $V_{GS(Peak)}$ = 1.2 V, I_{DQ} = 85 mA, P_{OUT} = 5.4 W avg, f = 2620, 2655, and 2690 MHz
WCDMA signal: 3GPP, channel bandwidth = 3.84 MHz, peak/average = 10 dB @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Linear Gain	G_{ps}	14	15	—	dB
Drain Efficiency	η_D	41	43	—	%
Adjacent Channel Power Ratio	ACPR	—	–27.5	–25.5	dBc

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

ESD: Electrostatic discharge sensitive device—observe handling precautions!

DC Characteristics

Characteristic		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	µA
		V_{DS} = 63 V, V_{GS} = 0 V	I_{DSS}	—	—	10	µA
On-State Resistance	(main)	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	0.8	—	Ω
	(peak)	V_{GS} = 10 V, V_{DS} = 0.1 V	$R_{DS(on)}$	—	0.6	—	Ω
Operating Gate Voltage	(main)	V_{DS} = 28 V, I_{DQ} = 0.085 A	V_{GS}	—	2.7	—	V
	(peak)	V_{DS} = 28 V, I_{DQ} = 0 A	V_{GS}	—	1.2	—	V
Gate Leakage Current		V_{GS} = 10 V, V_{DS} = 0 V	I_{GSS}	—	—	1	µA

Maximum Ratings

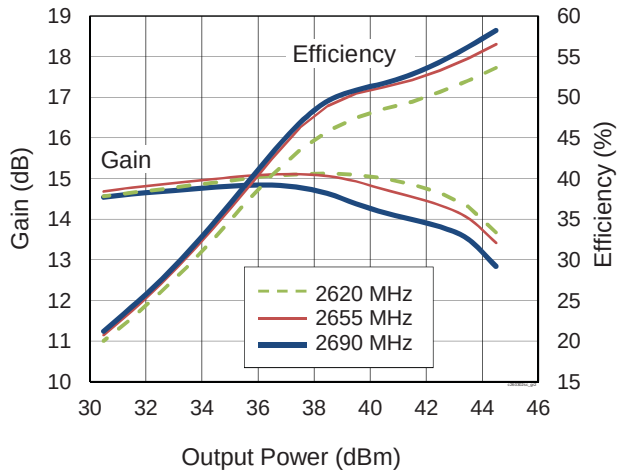
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	65	V
Gate-Source Voltage	V_{GS}	–6 to +10	V
Operating Voltage	V_{DD}	0 to +32	V
Junction Temperature	T_J	200	°C
Storage Temperature Range	T_{STG}	–65 to +150	°C
Thermal Resistance (T_{CASE} 70°C, 30 W CW)	$R_{\theta JC}$	1.67	°C/W

Ordering Information

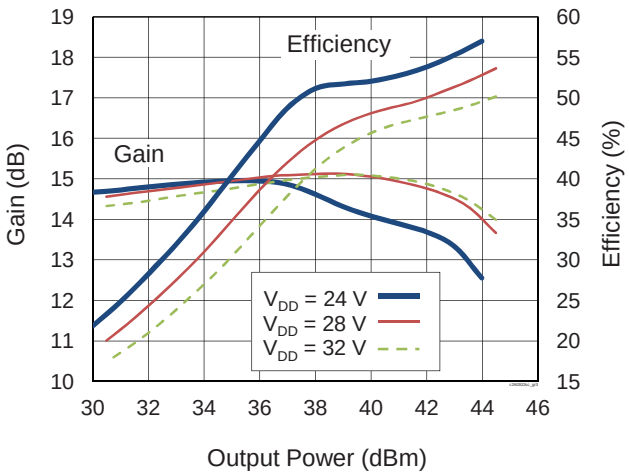
Type and Version	Order Code	Package and Description	Shipping
PTAC260302SC V1 R250	PTAC260302SCV1R250XTMA1	H-37248H-4 – Ceramic open-cavity, earless flange, formed leads	Tape & Reel, 250 pcs

Typical Performance (data taken in an Infineon gull-wing applications circuit)

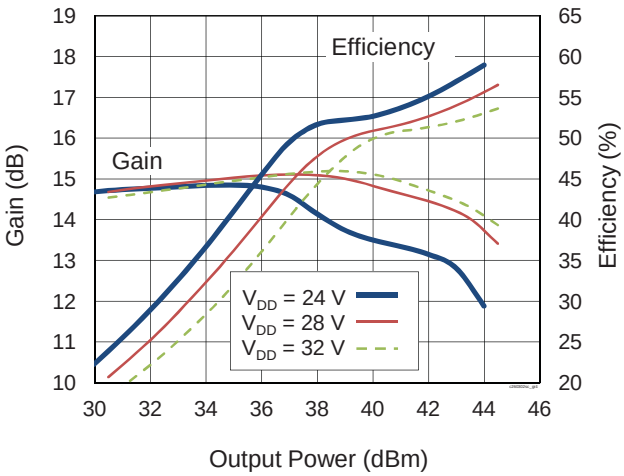
CW Performance
V_{DD} = 28 V, I_{DQ} = 85 mA,
series show frequency



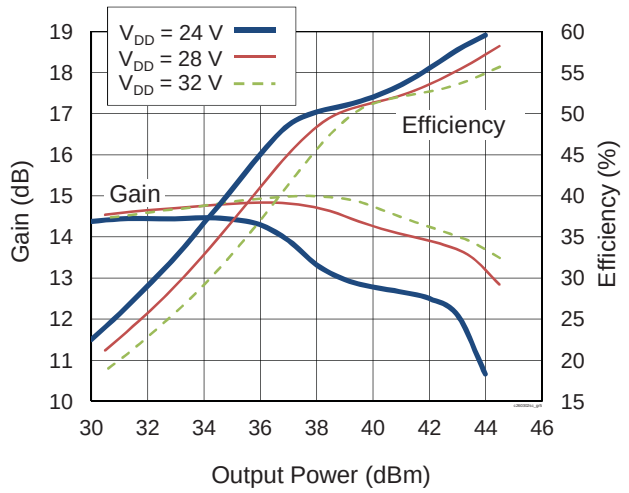
CW Performance
at selected V_{DD}
I_{DQ} = 85 mA, f = 2620 MHz



CW Performance
at selected V_{DD}
I_{DQ} = 85 mA, f = 2655 MHz

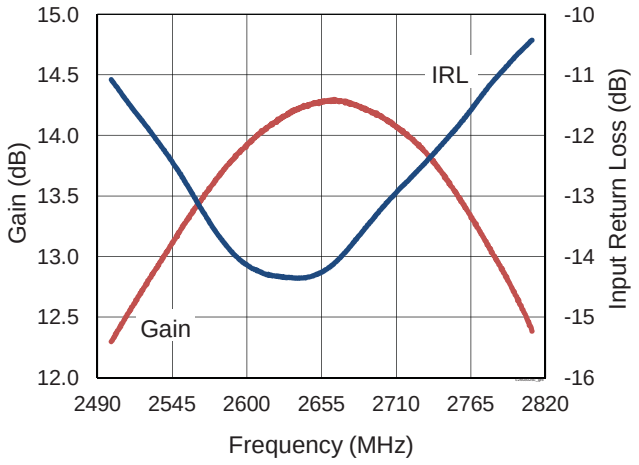


CW Performance
at selected V_{DD}
I_{DQ} = 85 mA, f = 2690 MHz

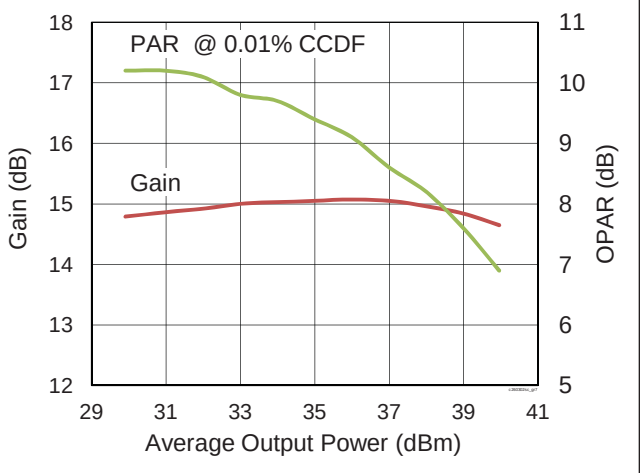


Typical Performance (cont.)

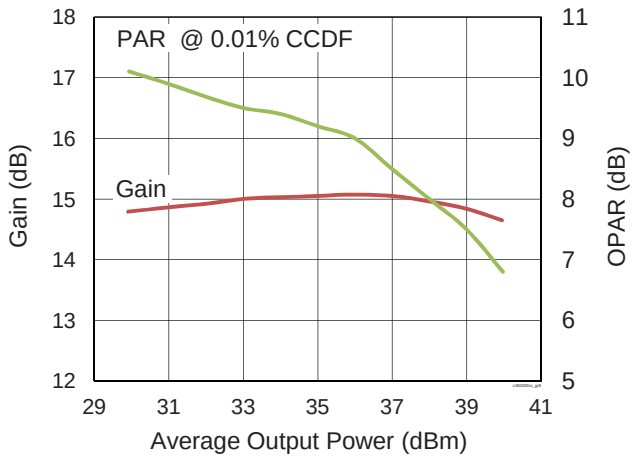
Small Signal CW Performance
V_{DD} = 28 V, I_{DQ} = 85 mA



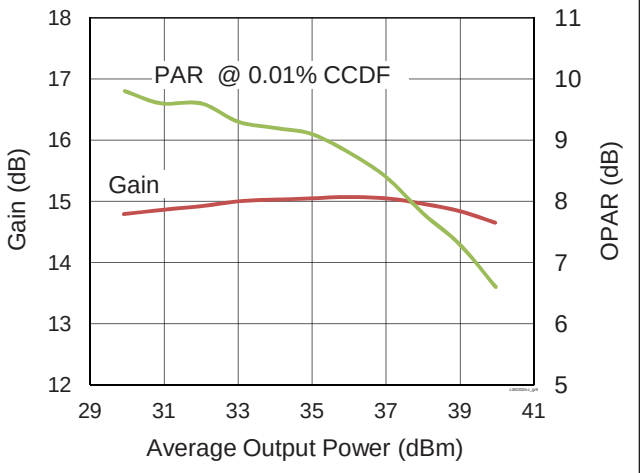
Single-carrier WCDMA Drive-up
V_{DD} = 28 V, I_{DQ} = 85 mA, f = 2620 MHz
3GPP WCDMA signal, 3.84 MHz BW



Single-carrier WCDMA Drive-up
V_{DD} = 28 V, I_{DQ} = 85 mA, f = 2655 MHz
3GPP WCDMA signal, 3.84 MHz BW



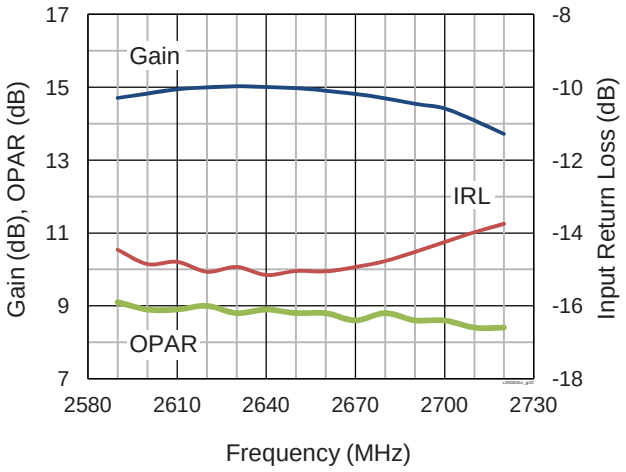
Single-carrier WCDMA Drive-up
V_{DD} = 28 V, I_{DQ} = 85 mA, f = 2690 MHz
3GPP WCDMA signal, 3.84 MHz BW



Typical Performance (cont.)

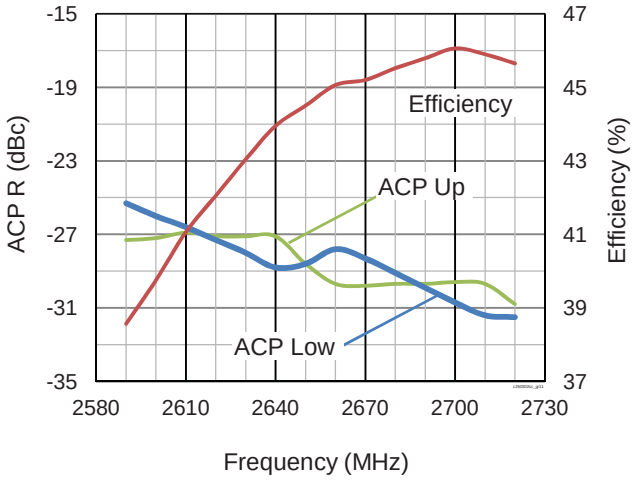
Single-carrier WCDMA Broadband Performance

V_{DD} = 28 V, I_{DQ} = 85 mA, P_{OUT} = 37.5 dBm, 3GPP WCDMA signal

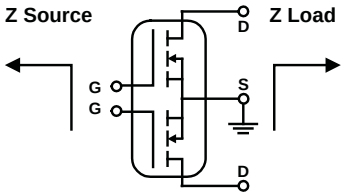


Single-carrier WCDMA Broadband Performance

V_{DD} = 28 V, I_{DQ} = 85 mA, P_{OUT} = 37.5 dBm, 3GPP WCDMA signal, 10.3 dB PAR



Load Pull Performance



Main Side – Pulsed CW signal: 16 µsec, 10% duty cycle; 28 V, 85 mA											
		P_{1dB}									
		Max Output Power					Max PAE				
Freq [MHz]	Zs Ω	Zl Ω	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	PAE %	Zl Ω	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	PAE %
2620	25 – j29	9.3 – j14.4	19.5	42.23	16.7	59.1	5.5 – j11.9	21.3	40.89	12.3	65.2
2655	42 – j33	12.1 – j14.1	19.2	42.30	17.0	56.7	6.8 – j12.2	20.8	41.40	13.8	64.6
2690	44 – j35	11.9 – j15.0	20.1	42.03	16.0	56.5	7.1 – j12.0	21.8	41.03	12.7	62.7

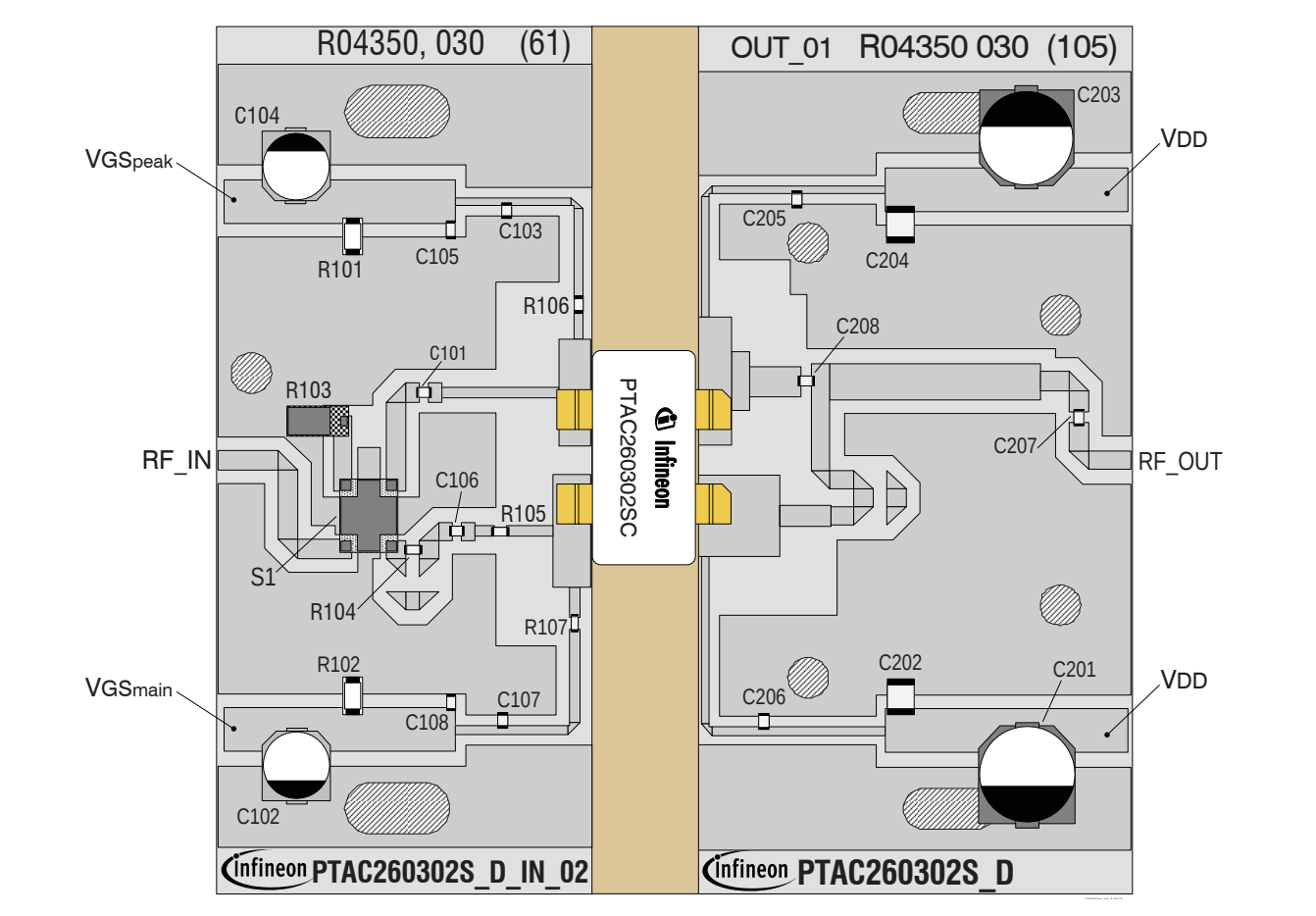
Peak Side – Pulsed CW signal: 16 µsec, 10% duty cycle; 28 V, 115 mA											
		P_{1dB}									
		Max Output Power					Max PAE				
Freq [MHz]	Zs Ω	Zl Ω	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	PAE %	Zl Ω	Gain [dB]	P_{OUT} [dBm]	P_{OUT} [W]	PAE %
2620	36 – j41	10.5 – j17.4	19.1	42.23	21.5	55.7	6.5 – j13.7	20.8	42.02	15.9	62.5
2655	43 – j31	10.7 – j17.5	18.7	42.30	21.5	55.2	6.3 – j15.8	20.2	42.39	17.3	61.2
2690	55 – j33	11.9 – j18.9	18.9	42.03	20.6	53.0	6.9 – j16.0	20.5	42.15	16.4	59.5

Reference Circuit, tuned for 2690 MHz

DUT	PTAC260302SC
Reference Fixture Part No.	LTA/PTAC260302SC V1
PCB	Rogers 4350, 0.762 mm [.030"] thick, 2 oz. copper, ε_r = 3.66

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

Reference Circuit (cont.)

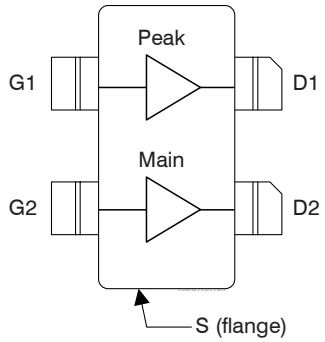


Reference circuit assembly diagram (not to scale)

Component Information

Component	Description	Suggested Manufacturer	P/N
Input			
C101, C103, C106, C107	Chip capacitor, 10 pF	ATC	ATC100A100JW150XB
C102, C104	Capacitor, 10 µF, 50 V pF	Panasonic Electronic Components	EEV-HD1H100P
C105, C108	Chip capacitor, 1 µF	Murata Electronics	GRM21BR71H105KA12L
R102	Resistor, 1 k Ohm	Panasonic Electronic Components	ERJ-8GEYJ102V
R103	Resistor, 50 Ohm	Anaren	C16A50Z4
R104, R105, R106, R107	Resistor, 10 Ohm	Panasonic Electronic Components	ERJ-3GEYJ100V
S1	Hybrid Coupler	Anaren	X3C25P1_05S
Output			
C201, C203	Capacitor, 100 µF, 35 V pF	Panasonic Electronic Components	EEE-FP1V101AP
C202, C204	Capacitor, 10 pF	Taiyo Yuden	UMK325C7106MM-T
C205, C206, C207, C208	Chip capacitor, 10 pF	ATC	ATC100A100JW150XB

Pinout Diagram (top view)



Pin	Description
D1	Drain Peak
D2	Drain Main
G1	Gate Peak
G2	Gate Main
S	Source

Lead connections for PTAC260302SC

Package Outline Specifications

Package H-37248H-4 (formed leads)

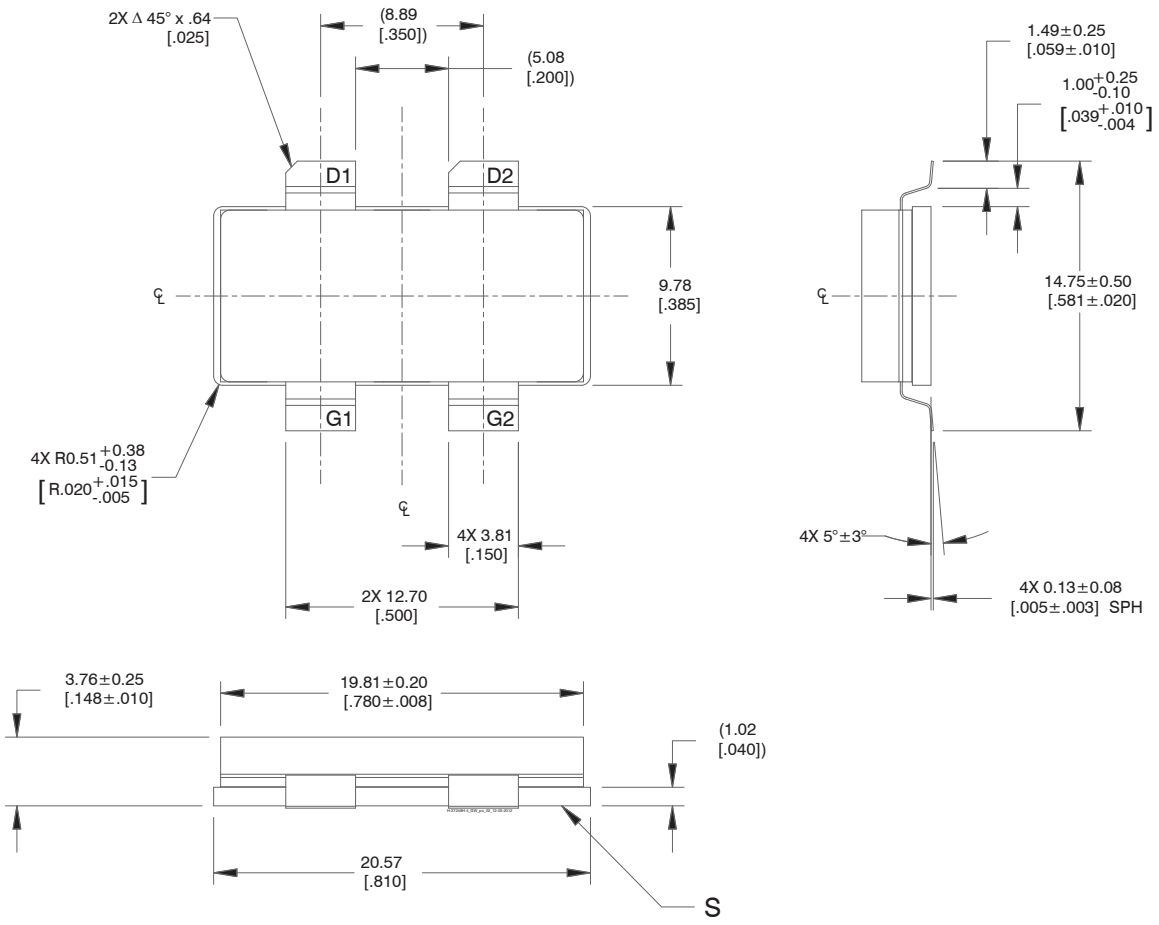


Diagram Notes—unless otherwise specified:

1. Interpret dimensions and tolerances per ASME Y14.5M-1994.
2. Primary dimensions are mm. Alternate dimensions are inches.
3. All tolerances ± 0.127 [.005] unless specified otherwise.
4. Pins: D1, D2 – drains; G1, G2 – gates; S – source.
5. Lead thickness: 0.10 + 0.051/-0.025 mm [.004 +0.002/-0.001 inch].
6. Gold plating thickness: 1.14 ± 0.38 micron [45 ± 15 microinch].

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

Revision History:	2013-08-28	Data Sheet
Previous Version:	2012-04-08, Data Sheet	
Page	Subjects (major changes since last revision)	
2	Product Type updated.	

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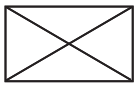

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