

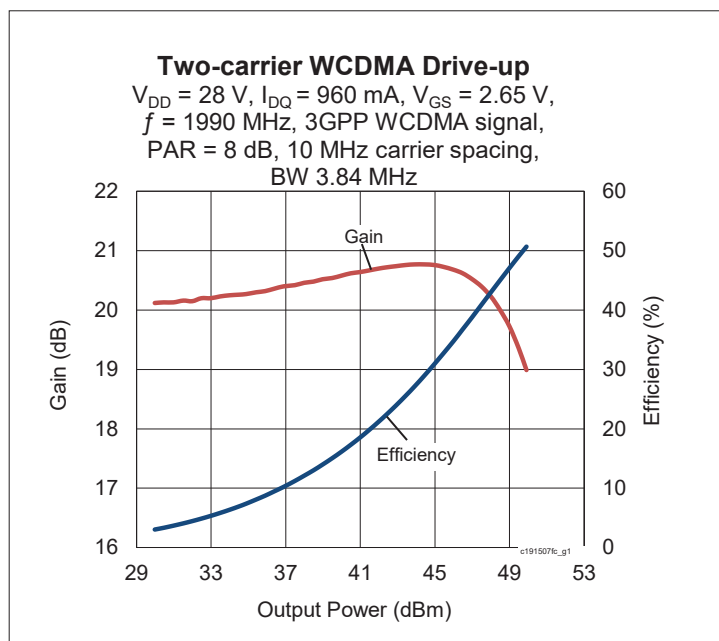
PXFC191507FC

Thermally-Enhanced High Power RF LDMOS FET 150 W, 28 V, 1805 – 1990 MHz

Description

The PXFC191507FC is a 150-watt LDMOS FET intended for use in multi-standard cellular power amplifier applications in the 1805 to 1990 MHz frequency band. Features include input and output matching, high gain and thermally-enhanced package with earless flanges. Manufactured with Wolfspeed's advanced LDMOS process, this device provides excellent thermal performance and superior reliability.

PXFC191507FC
Package H-37248G-4/2



Features

- Broadband internal input and output matching
- Typical Pulsed CW performance, 1990 MHz, 28 V, 10 μs pulse width, 10% duty cycle, class AB test
 - Output power at P_{1dB} = 140 W
 - Efficiency = 54%
 - Gain = 19.5 dB
- Typical single-carrier WCDMA performance, 1990 MHz, 28 V, 10 dB PAR @ 0.01% CCDF, Test Model 1 with 16DPCH
 - Output power = 32 W avg
 - Efficiency = 34%
 - Gain = 20 dB
 - ACPR = -31 dBc @ 5 MHz
- Capable of handling 10:1 VSWR @ 28 V, 150 W (CW) output power
- Integrated ESD protection : Human Body Model, Class 1C (per JESD22-A114)
- Low thermal resistance
- Pb-free and RoHS compliant

RF Characteristics

Two-carrier WCDMA Specifications (tested in Wolfspeed production test fixture)

$V_{DD} = 28\text{ V}$, $I_{DQ} = 960\text{ mA}$, $P_{OUT} = 32\text{ W avg}$, $f_1 = 1980\text{ MHz}$, $f_2 = 1990\text{ MHz}$, 3GPP signal, channel bandwidth = 3.84 MHz, peak/average = 8 dB @ 0.01% CCDF

Characteristic	Symbol	Min	Typ	Max	Unit
Gain	G_{ps}	19	20.5	—	dB
Drain Efficiency	η_D	29	31	—	%
Intermodulation Distortion	IMD	—	-33	-31	dBc

All published data at $T_{CASE} = 25^\circ\text{C}$ unless otherwise indicated

ESD: Electrostatic discharge sensitive device—observe handling precautions!

DC Characteristics (each side)

Characteristic	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_{DS} = 10\text{ mA}$	$V_{(BR)DSS}$	65	—	—	V
Drain Leakage Current	$V_{DS} = 28\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	—	0.05	1	μA
	$V_{DS} = 63\text{ V}, V_{GS} = 0\text{ V}$	I_{DSS}	—	—	10	μA
On-State Resistance	$V_{GS} = 10\text{ V}, V_{DS} = 0.1\text{ V}$	$R_{DS(on)}$	—	0.05	—	Ω
Operating Gate Voltage	$V_{DS} = 26\text{ V}, I_{DQ} = 960\text{ mA}$	V_{GS}	2.3	2.6	2.9	V
Gate Leakage Current	$V_{GS} = 10\text{ V}, V_{DS} = 0\text{ V}$	I_{GSS}	—	—	1	μA

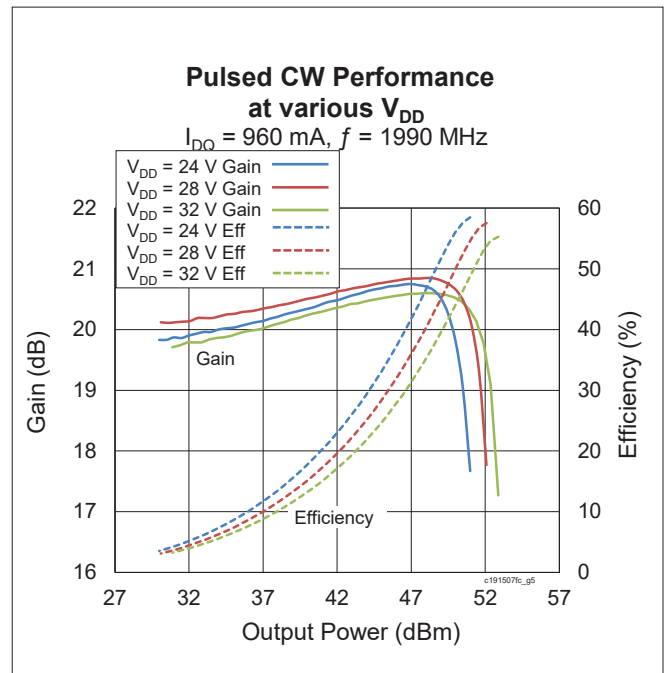
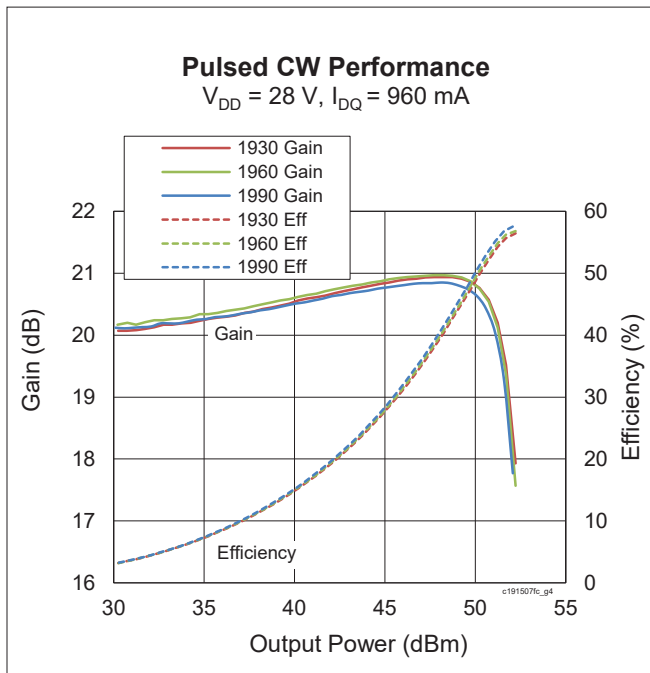
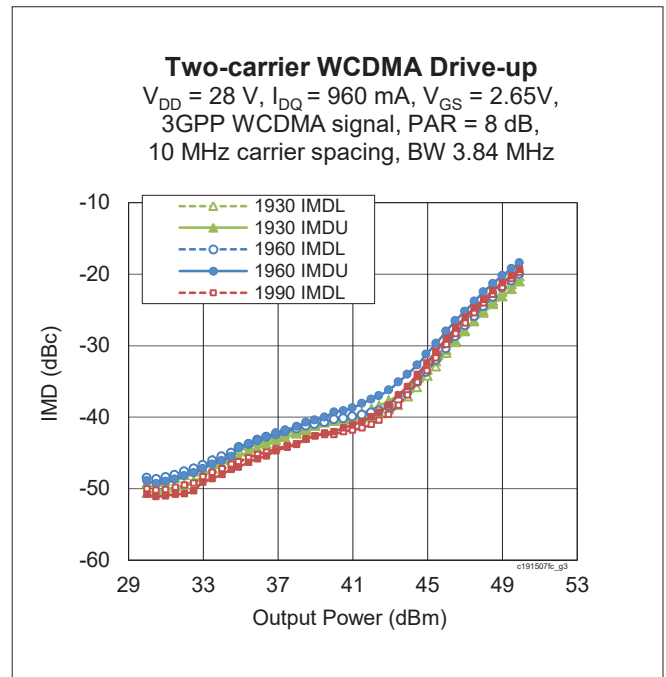
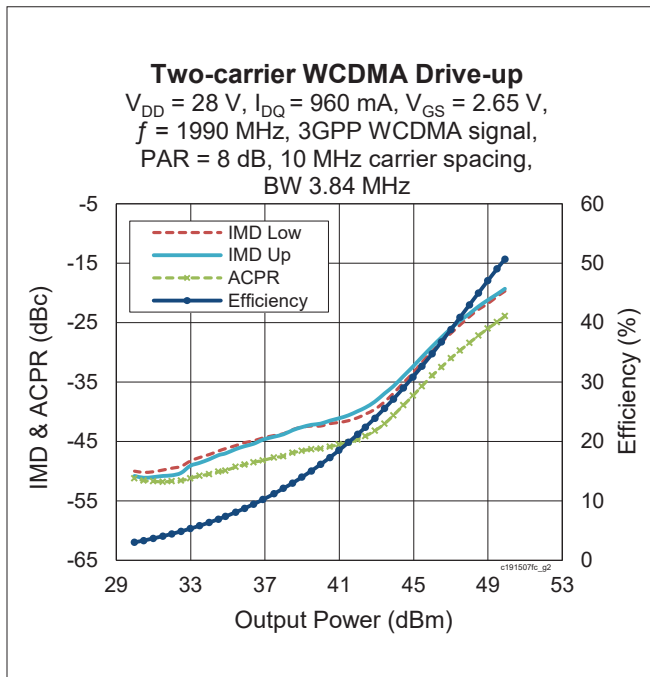
Maximum Ratings

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	225	$^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-65 to +150	$^{\circ}\text{C}$
Thermal Resistance ($T_{CASE} = 70^{\circ}\text{C}, 140\text{ W CW}$)	$R_{\theta JC}$	0.43	$^{\circ}\text{C/W}$

Ordering Information

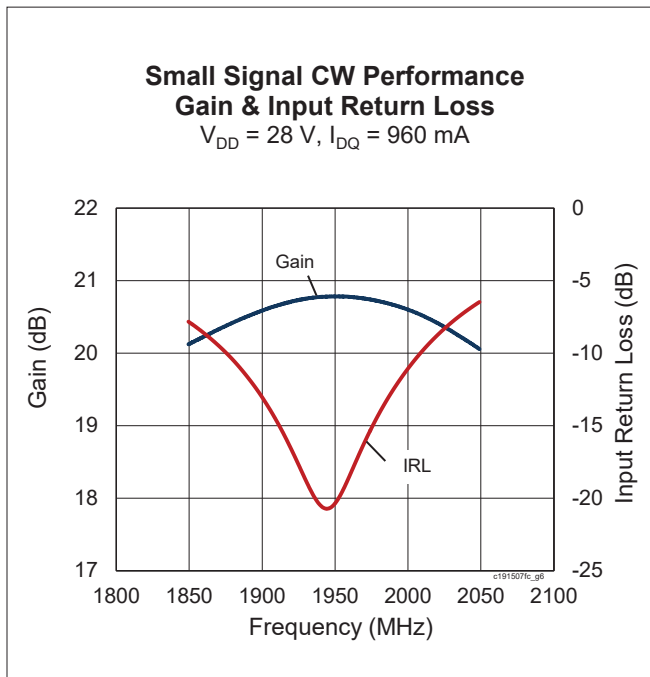
Type and Version	Order Code	Package Description	Shipping
PXFC191507FC V1 R0	PXFC191507FC-V1-R0	H-37248G-4/2, earless flange	Tape & Reel, 50 pcs
PXFC191507FC V1 R250	PXFC191507FC-V1-R250	H-37248G-4/2, earless flange	Tape & Reel, 250 pcs

Typical Performance (data taken in a production test fixture)

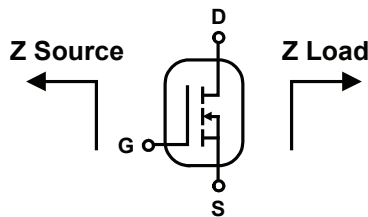




Typical Performance (cont.)



Broadband Circuit Impedance



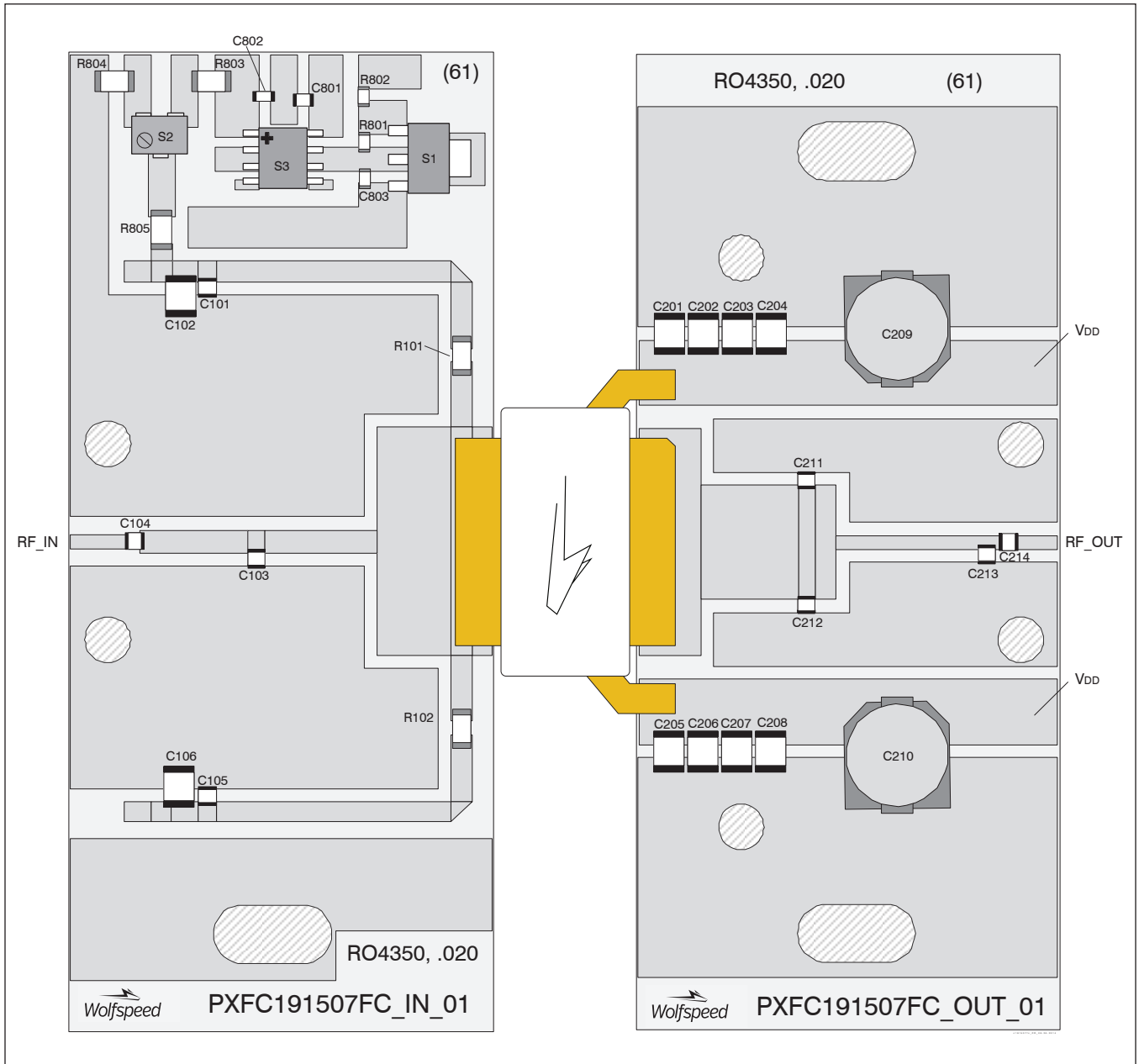
Freq [MHz]	Z Source Ω		Z Load Ω	
	R	jX	R	jX
1930	1.34	-4.30	1.55	-3.14
1960	1.28	-4.15	1.54	-2.99
1990	1.25	-4.04	1.52	-2.86

Load Pull Performance

Main Side Load Pull Performance – Pulsed CW signal: 100 μs , 10% duty cycle, $V_{DD} = 28\text{ V}$, $I_{DQ} = 960\text{ mA}$

Freq [MHz]	Zs [Ω]	P _{1dB}									
		Max Output Power					Max PAE				
		ZI [Ω]	Gain [dB]	P _{OUT} [dBm]	P _{OUT} [W]	PAE [%]	ZI [Ω]	Gain [dB]	P _{OUT} [dBm]	P _{OUT} [W]	PAE [%]
1805	1.00 - j3.39	1.36 - j2.81	18.2	52.30	170	58.1	2.82 - j2.46	20.4	50.40	110	65.7
1880	1.38 - j3.80	1.26 - j3.35	17.8	52.10	164	54.7	2.48 - j2.33	20.2	50.50	112	64.8
1930	1.88 - j4.65	1.14 - j3.38	17.6	52.10	162	52.1	2.25 - j2.06	20.1	50.20	104	63.7
1990	2.85 - j4.62	1.31 - j3.40	18.4	52.00	157	56.4	1.81 - j2.40	19.9	50.60	116	62.8

Reference Circuit , 1930 – 1990 MHz



Reference circuit assembly diagram (not to scale)



Reference Circuit (cont.)

Reference Circuit Assembly

DUT	PXFC191507FC V1
Test Fixture Part No.	LTN/PXFC191507FC V1
PCB	Rogers 4350, 0.508 mm [0.020"] thick, 2 oz. copper, $\epsilon_r = 3.66$, $f = 1930 - 1990$ MHz
Find Gerber files for this test fixture on the Wolfspeed Web site at www.wolfspeed.com/RF	

Components Information

Component	Description	Suggested Manufacturer	P/N
Input			
C101, C104, C105,	Capacitor, 33 pF	ATC	ATC800A330JT250
C102, C106	Capacitor, 10 μ F	Taiyo Yuden	UMK325C7106MM-T
C103	Capacitor, 1.0 pF	ATC	ATC800A1R0BT250
C801, C802, C803	Capacitor, 1000 pF	Panasonic Electronic Components	ECJ-1VB1H102K
R101, R102, R805	Capacitor, 10 ohms	Panasonic Electronic Components	ERJ-8GEYJ100V
R801	Resistor, 1200 Ohm	Panasonic Electronic Components	ERJ-3GEYJ122V
R802	Resistor, 1300 Ohm	Panasonic Electronic Components	ERJ-3GEYJ132V
R803, R804	Capacitor, 100 ohms	Panasonic Electronic Components	ERJ-8GEYJ101V
S1	Transistor	Infineon Technologies	BCP56
S2	Potentiometer, 2k Ω	Bourns Inc.	3224W-1-202E
S3	Voltage Regulator	Texas Instruments	LM7805
Output			
C201, C202, C203, C204, C205, C206, C207, C208	Capacitor, 10 μ F	Taiyo Yuden	UMK325C7106MM-T
C209, C210	Capacitor, 220 μ F	Panasonic Electronic Components	EEE-FP1V221AP
C211, C212, C213	Capacitor, 0.3 pF	ATC	ATC800A0R3BT250
C214	Capacitor, 33 pF	ATC	ATC800A330JT250

Revision History

Revision	Date	Data Sheet Type	Page	Subjects (major changes since last revision)
01	2014-04-11	Advance	All	Data Sheet reflects advance specification for product development
02	2014-08-26	Production	All All	Data Sheet reflects released product specification Revised all data and includes final specs, typical performance graphs, loadpull, reference circuit
02.1	2016-06-22	Production	2	Updated ordering information
03	2018-06-25	Production	All	Converted to Wolfspeed Data Sheet

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Notes

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