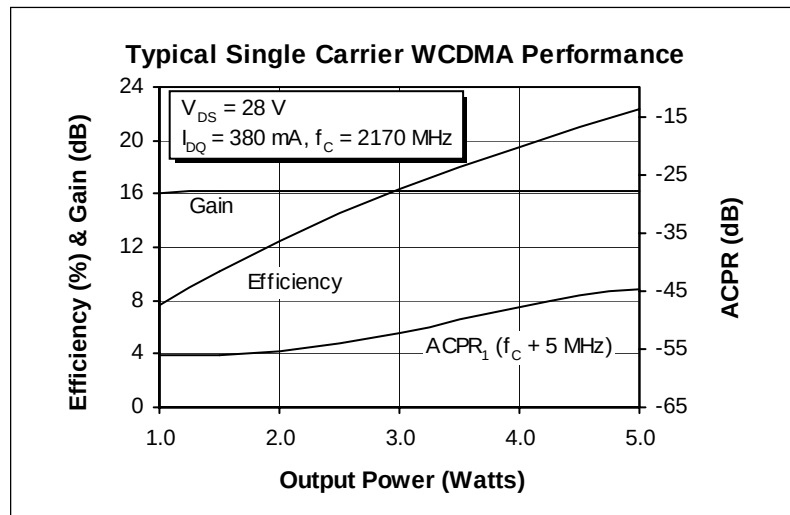


30 Watts, 2110-2170 MHz GOLDMOS[®] Field Effect Transistor

PTF 102015

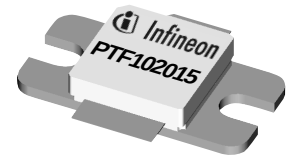
Description

The PTF 102015 is a 30-watt internally matched GOLDMOS FET intended for WCDMA applications from 2110 to 2170 MHz. This LDMOS device operates at 47% efficiency with 16 dB gain. Full gold metallization ensures excellent device lifetime and reliability.



Key Features

- **INTERNALLY MATCHED**
- **Typical WCDMA Performance**
 - Average Output Power = 4.5 Watts
 - Gain = 16 dB
 - Efficiency = 20% (Channel Bandwidth 3.84 MHz)
- **Typical CW Performance**
 - Output Power at P-1dB = 34 Watts
 - Gain = 15 dB
 - Efficiency = 47%
- **Full Gold Metallization**
- **Integrated ESD Protection; Class 1 (minimum) Human Body Model**
- **Excellent Thermal Stability**
- **Broadband Internal Matching**
- **Low HCI Drift**
- **Capable of Handling 10:1 VSWR @ 28 V, 30 Watts (CW) Output Power**



Package 20265

Guaranteed Performance

WCDMA Measurements (in Infineon test fixture)

$V_{DD} = 28\text{ V}$, $I_{DQ} = 380\text{ mA}$, $P_{OUT} = 4.5\text{ W}$

$f = 2170\text{ MHz}$, Single Carrier 3GPP Channel Bandwidth 3.84 MHz, Adj Channels $\pm 5\text{ MHz}$, Peak to Avg 8.5:1

Characteristic	Symbol	Min	Typ	Max	Units
Adjacent Channel Power Ratio	ACPR	—	-46	-42	dB
Gain	G_{ps}	14.5	16	—	dB
Drain Efficiency	η_D	—	20	—	%

Two-Tone Measurements (in Infineon test fixture)

$V_{DD} = 28\text{ V}$, $I_{DQ} = 380\text{ mA}$, $P_{OUT} = 30\text{ W PEP}$, $f_c = 2170\text{ MHz}$, Tone Spacing = 100 kHz

Characteristic	Symbol	Min	Typ	Max	Units
Gain	G_{ps}	14	15	—	dB
Drain Efficiency	η_D	—	39	—	%
Intermodulation Distortion	IMD	—	-32	-28	dBc

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

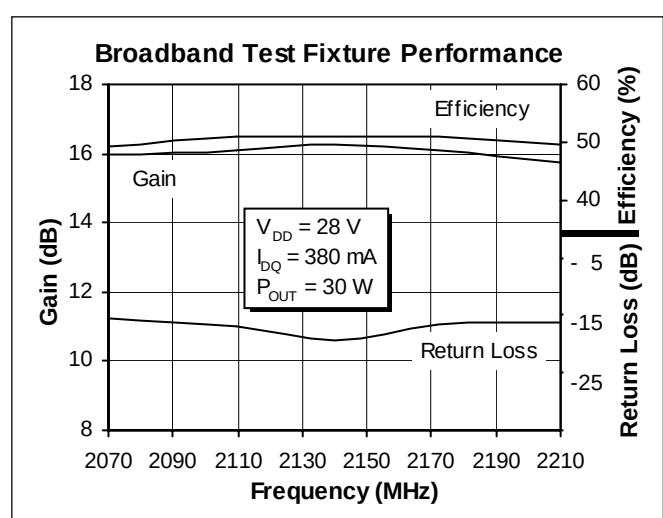
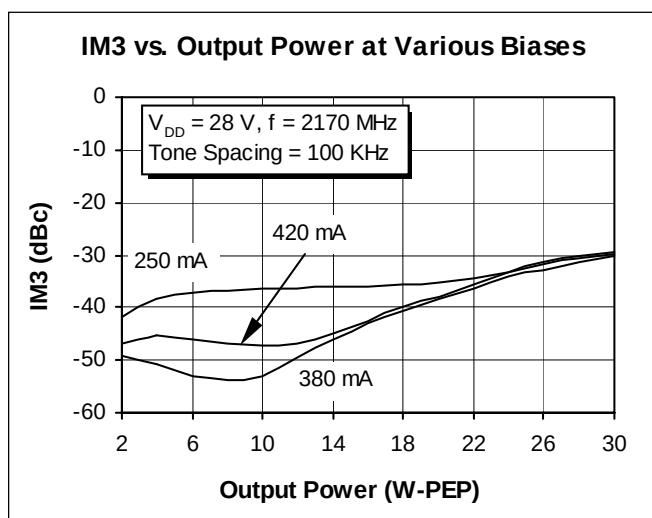
Electrical Characteristics (Guaranteed)

Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}$, $I_{DS} = 10\text{ }\mu\text{A}$	$V_{(BR)DSS}$	65	—	—	Volts
Drain Leakage Current	$V_{DS} = 28\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	1.0	μA
On-State Resistance	$V_{GS} = 10\text{ V}$, $I_{DS} = 1\text{ A}$	$R_{DS(on)}$	—	.3	—	Ohms
Quiescent Current Gate Voltage	$V_{DS} = 28\text{ V}$, $I_D = 380\text{ mA}$	$V_{GS(Q)}$	2.5	3.2	4	Volts
Gate Leakage Current	$V_{GS} = 10\text{ V}$, $V_{DS} = 0\text{ V}$	I_{GSS}	—	—	100	nA

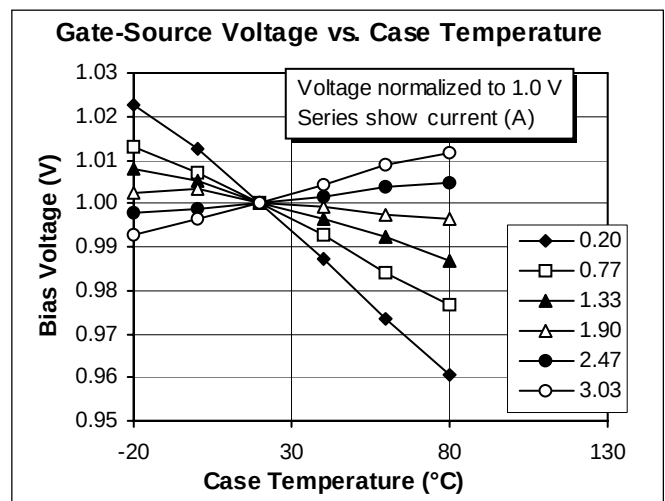
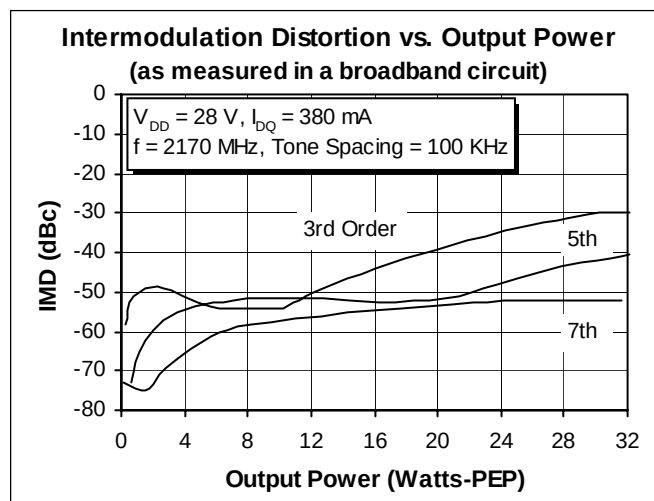
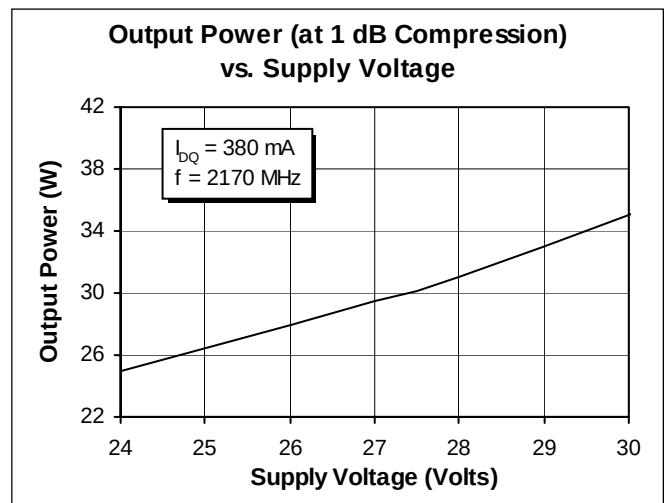
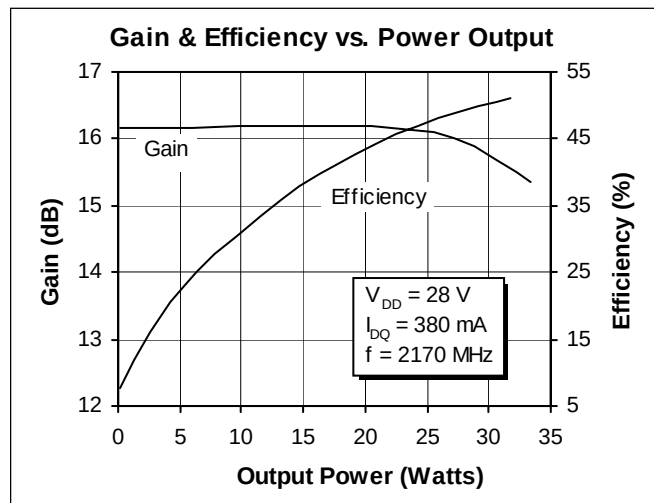
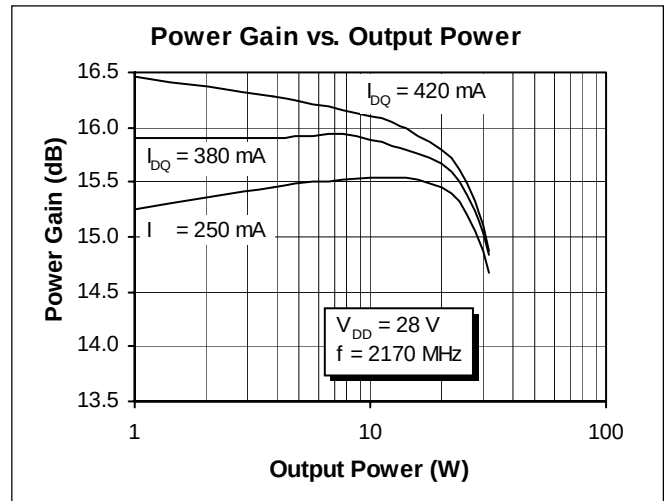
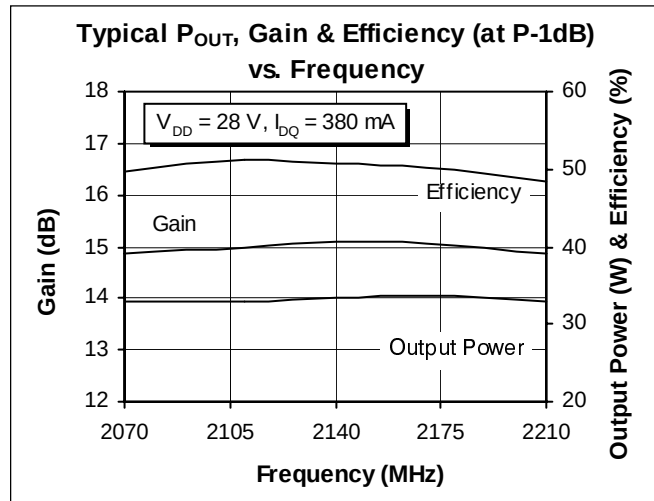
Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	65	Vdc
Gate-Source Voltage	V_{GS}	+15, -0.5	Vdc
Operating Junction Temperature	T_J	200	$^{\circ}\text{C}$
Total Device Dissipation Above 25 $^{\circ}\text{C}$ derate by	P_D	109 0.625	Watts W/ $^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-40 to +150	$^{\circ}\text{C}$
Thermal Resistance ($T_{CASE} = 70^{\circ}\text{C}$)	$R_{\theta JC}$	1.5	$^{\circ}\text{C/W}$

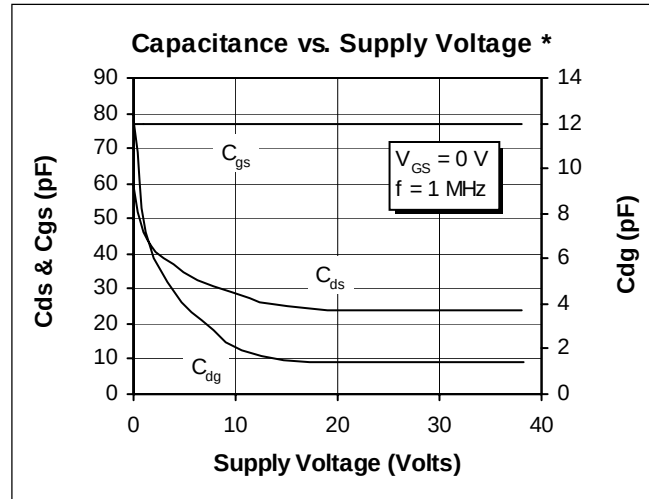
Typical Performance



Typical Performance (cont.)

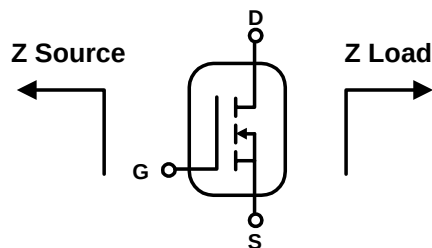


Typical Performance (cont.)

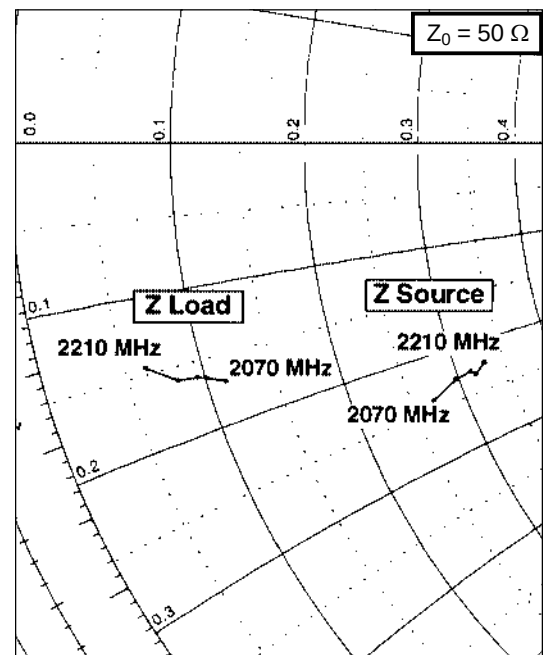


* This part is internally matched. Measurements of the finished product will not yield these results.

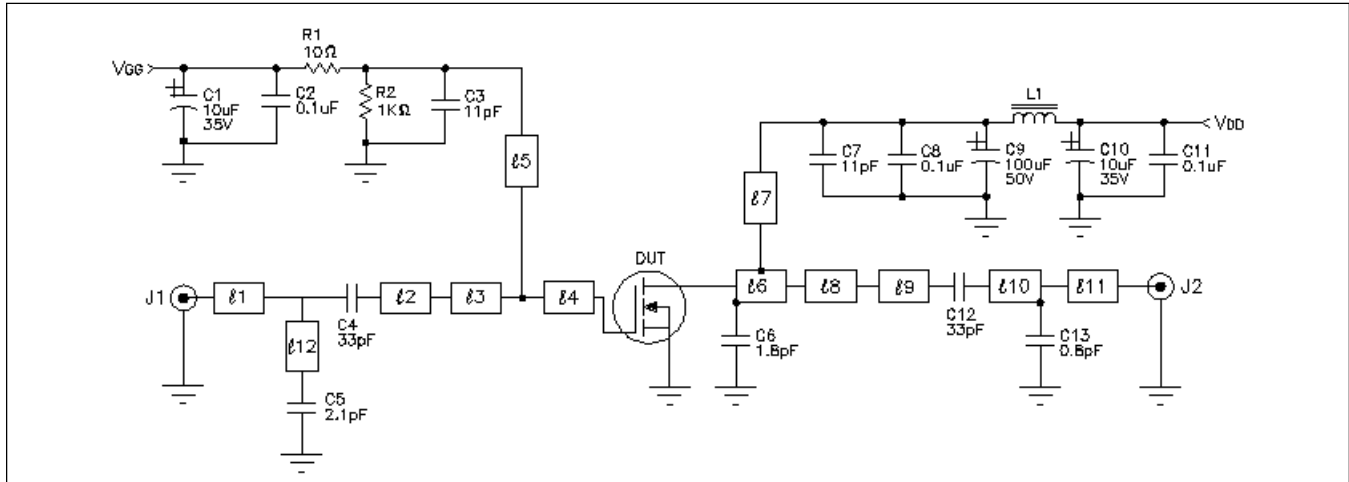
Broadband Circuit Impedance



Frequency MHz	Z Source Ω		Z Load Ω	
	R	jX	R	jX
2070	13.5	-12.1	5.7	-8.5
2110	14.9	-11.5	5.1	-8.2
2140	15.7	-11.4	4.8	-8.1
2170	15.9	-11.6	4.1	-8.0
2210	16.5	-11.2	3.2	-7.3

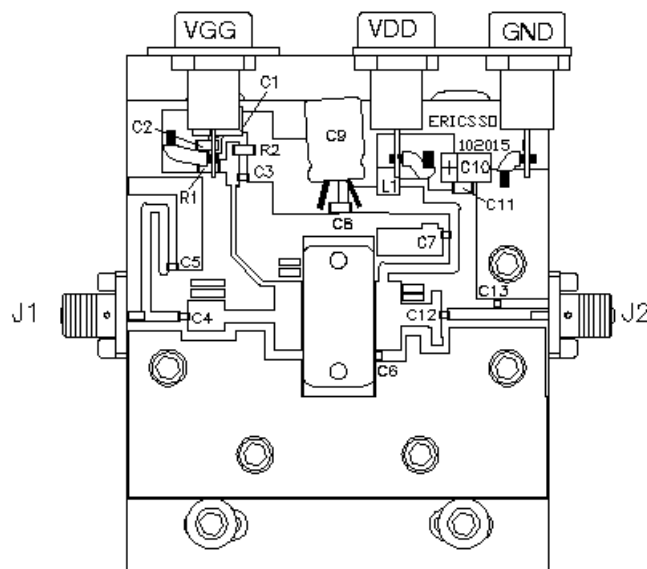


Test Circuit



Test Circuit Schematic for $f = 2170 \text{ MHz}$

DUT	PTF 102015	LDMOS Transistor	C1, C10	10 μF , 35 V	Capacitor, Digi-Key PC56106
l1	0.102 λ @ 2170 MHz	Microstrip 50 Ω	C2, C8, C11	0.1 μF , 50 V	Capacitor, Digi-Key PCC103 BCT
l2	0.078 λ @ 2170 MHz	Microstrip 22.8 Ω	C3, C7	11 pF	Capacitor, 100 A 110
l3	0.098 λ @ 2170 MHz	Microstrip 42.8 Ω	C4, C12	33 pF	Capacitor, 100 A 330
l4	0.053 λ @ 2170 MHz	Microstrip 11.6 Ω	C5	2.1 pF	Capacitor, 100 A 2R1
l5	0.136 λ @ 2170 MHz	Microstrip 74 Ω	C6	1.8 pF	Capacitor, 100 A 1R8
l6	0.054 λ @ 2170 MHz	Microstrip 11.6 Ω	C9	100 μF , 50 V	Capacitor, Digi-Key P5182
l7	0.340 λ @ 2170 MHz	Microstrip 50 Ω	C13	0.8 pF	Capacitor, 100 A 0R8
l8	0.060 λ @ 2170 MHz	Microstrip 28.6 Ω	J1, J2	Connector, SMA, Female, Panel Mount	
l9	0.019 λ @ 2170 MHz	Microstrip 14.3 Ω	L1	6 mm	Ferrite Phillips 53/3/4.6-452
l10	0.110 λ @ 2170 MHz	Microstrip 50 Ω	R1	10 ohm, 1/8 W	Chip Resistor 1206 Digi-Key 100 ECT
l11	0.087 λ @ 2170 MHz	Microstrip 50 Ω	R2	1K ohm, 1/8 W	Chip Resistor 1206 Digi-Key 102 ECT
l12	0.373 λ @ 2170 MHz	Microstrip 54.5 Ω	Circuit Board	.030" thick, TMM4, 2 oz Copper, Fabrication	



Assembly Diagram (not to scale)

Case Outline Specifications

