

PRELIMINARY

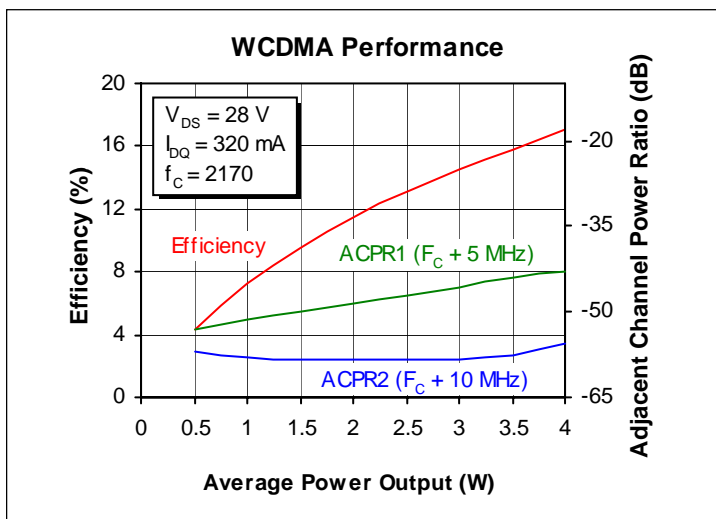
PTF 102015*

GOLDMOS® Field Effect Transistor

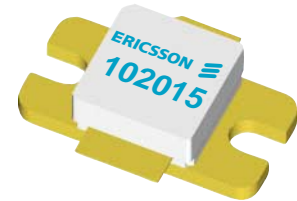
30 Watts, 2110-2170 MHz

Description

The PTF 102015 is a 30-watt GOLDMOS FET intended for WCDMA applications from 2110 to 2170 MHz. This LDMOS device operates at 47% efficiency with 13 dB gain. Nitride surface passivation and full gold metallization ensure excellent device lifetime and reliability.



- **Typical WCDMA Performance**
 - Average Output Power = 3.2 Watts
 - Gain = 14 dB
 - Efficiency = 17 %
(Channel Bandwidth 4.096 MHz)
- **Typical CW Performance**
 - Output Power at P-1dB = 34 Watts
 - Gain = 13 dB
 - Efficiency = 47 %
- Full Gold Metallization
- Integrated ESD Protection
- Excellent Thermal Stability
- Broadband Internal Matching
- Low HCI Drift
- Will Handle 10:1 VSWR at 28 V, 30 W



Package 20265

Guaranteed Performance

Two-Tone Measurements

$V_{DD} = 28\text{ V}$, $P_{OUT} = 30\text{ W}$ (PEP), $I_{DQ} = 320\text{ mA}$, $f_C = 2.17\text{ GHz}$, Tone Spacing = 1 MHz

Characteristic	Symbol	Min	Typ	Max	Units
Gain	G_{ps}	13	—	—	dB
Drain Efficiency	η_D	34	—	—	%
Intermodulation Distortion	IMD	—	-32	-28	dBc

WCDMA Measurements

Single Carrier 3GPP Channel Bandwidth 3.84 MHz, Adj Channels $\pm 5\text{ MHz}$ Peak to Avg 9.0: 1, $P_{out} = 3\text{ W}$, $f = 2.17\text{ GHz}$

Characteristic	Symbol	Min	Typ	Max	Unit
Adjacent Channel Power Ratio	ACPR	—	-46	-42	dB
Gain	G_{ps}	13	—	—	dB
Drain Efficiency	η_D	13.0	—	—	%

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

* Note: Specification is preliminary and subject to change. Order this product or obtain additional information from your Ericsson Sales Representative.

Electrical Characteristics (100% Tested)

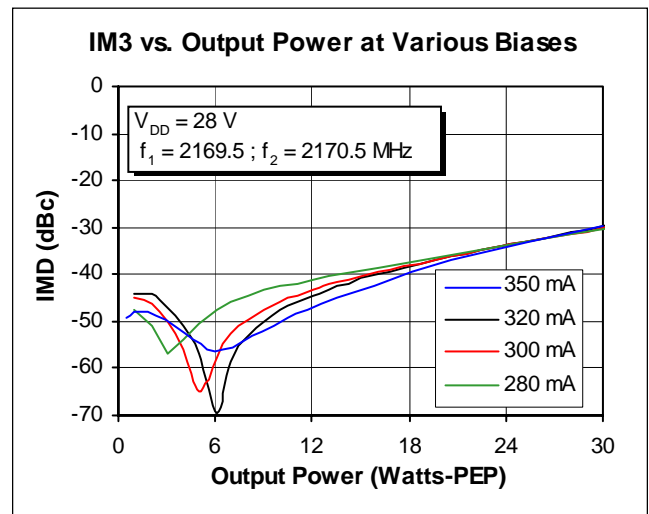
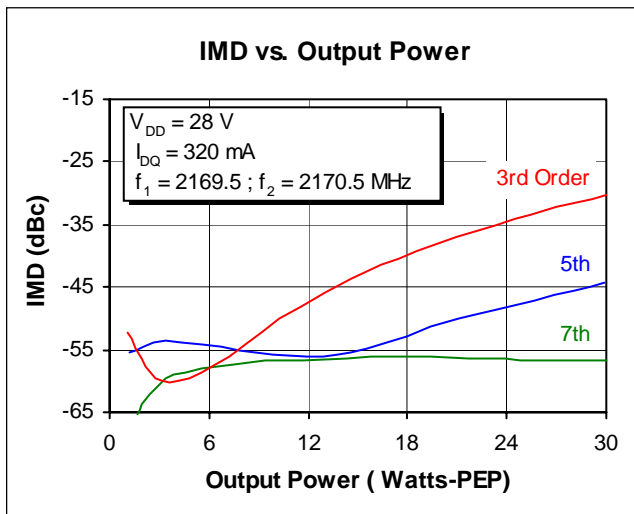
Characteristic	Conditions	Symbol	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}$, $I_D = 10\text{ }\mu\text{A}$	$V_{(BR)DSS}$	65	—	—	Volts
Zero Gate Voltage Drain Current	$V_{DS} = 28\text{ V}$, $V_{GS} = 0\text{ V}$	I_{DSS}	—	—	1.0	μA
Gate Threshold Voltage	$V_{DS} = 10\text{ V}$, $I_D = 1\text{ mA}$	$V_{GS(th)}$	3.0	—	5.0	Volts
Forward Transconductance	$V_{DS} = 10\text{ V}$, $I_D = 1\text{ A}$	g_{fs}	—	1.2	—	Siemens
On-State Resistance	$V_{GS} = 10\text{ V}$, $I_{DS} = 0.1\text{ A}$	$R_{DS(on)}$	—	0.3	—	Ohms

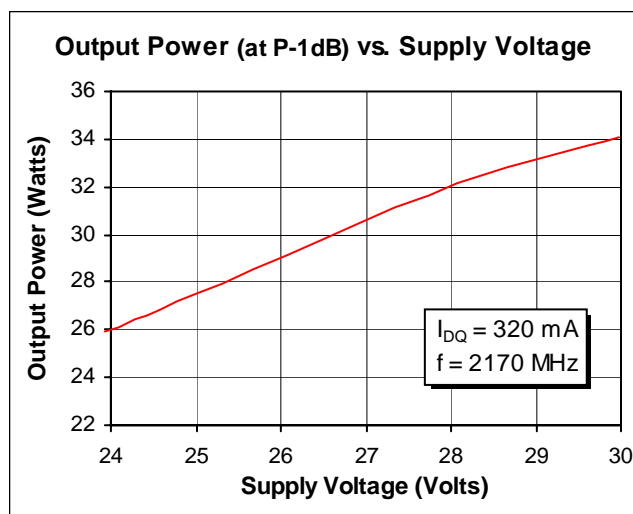
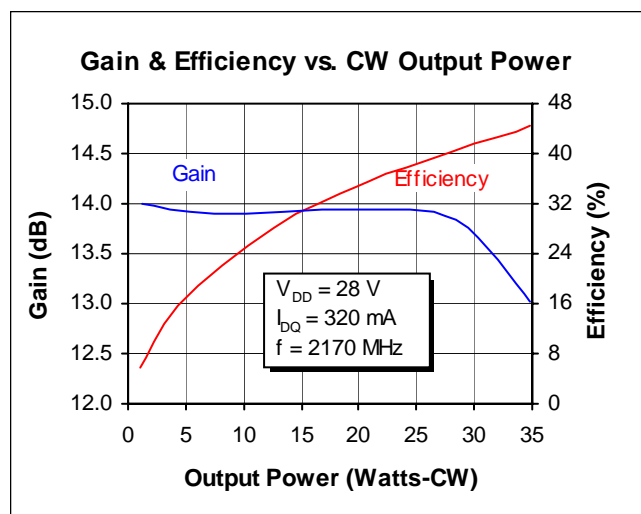
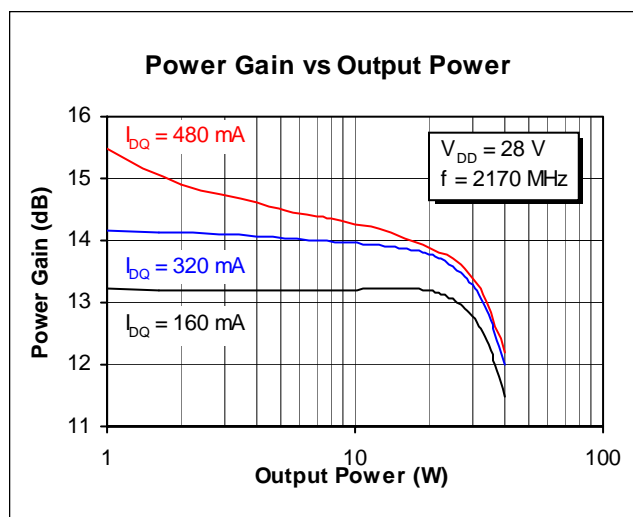
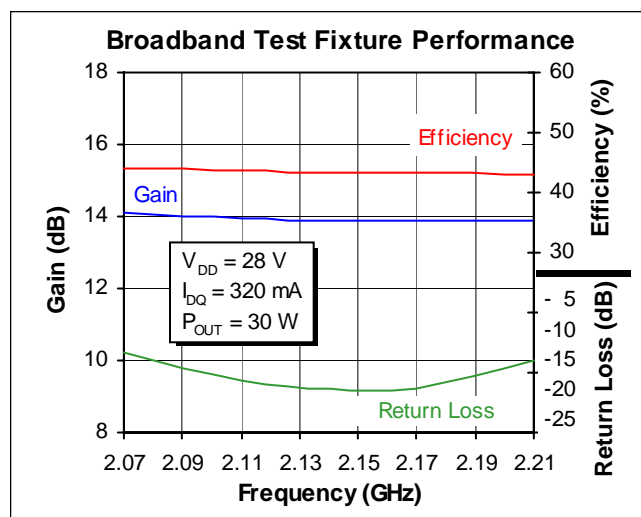
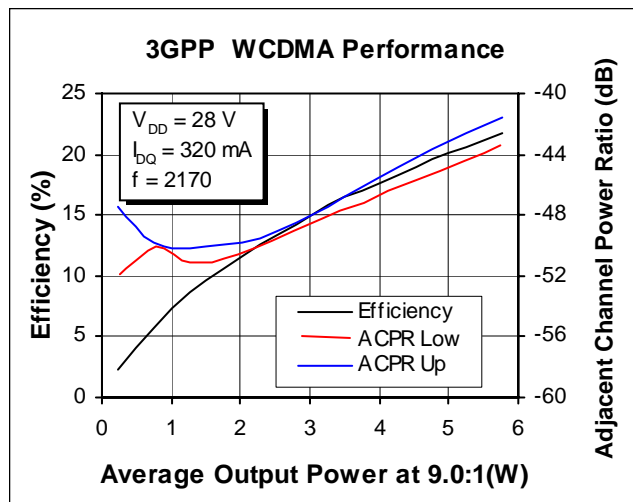
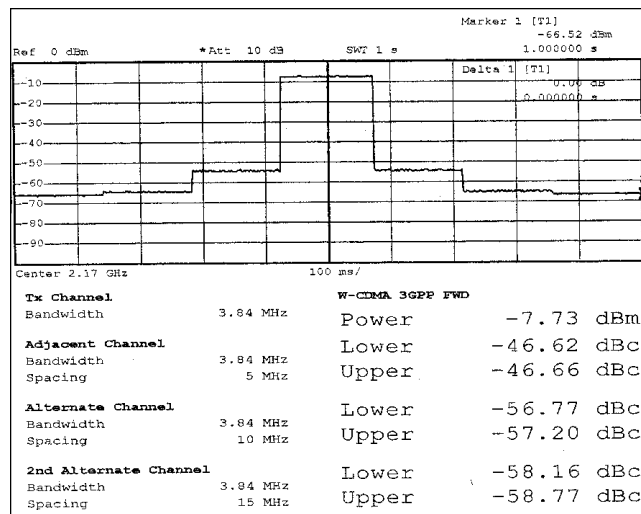
Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	65	Vdc
Gate-Source Voltage	V_{GS}	± 20	Vdc
Operating Junction Temperature	T_J	200	$^{\circ}\text{C}$
Total Device Dissipation Above 25°C derate by	P_D	109 0.625	Watts $\text{W}/^{\circ}\text{C}$
Storage Temperature Range	T_{STG}	-40 to $+150$	$^{\circ}\text{C}$
Thermal Resistance ($T_{CASE} = 70^{\circ}\text{C}$)	$R_{\theta JC}$	1.60	$^{\circ}\text{C}/\text{W}$

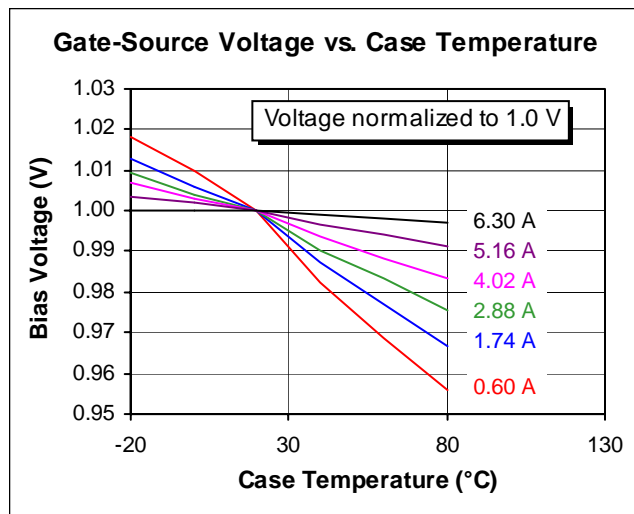
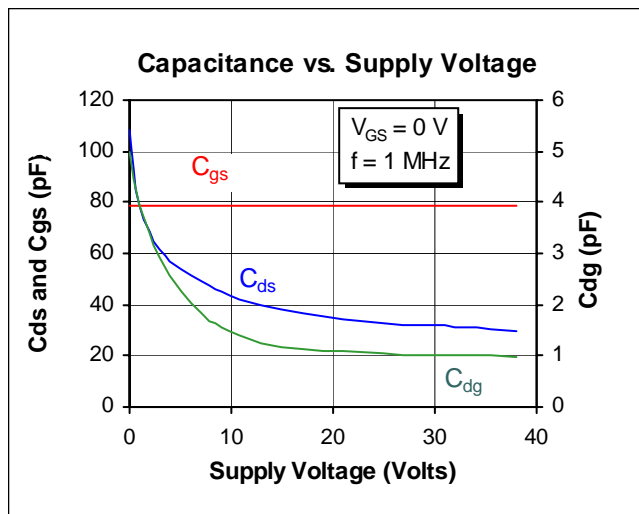
Typical Performance

(Modified 3GPP: Clip I + Q 67%, w16 DPCH, CCDF = 9.0:1)

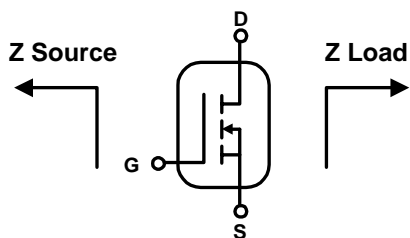




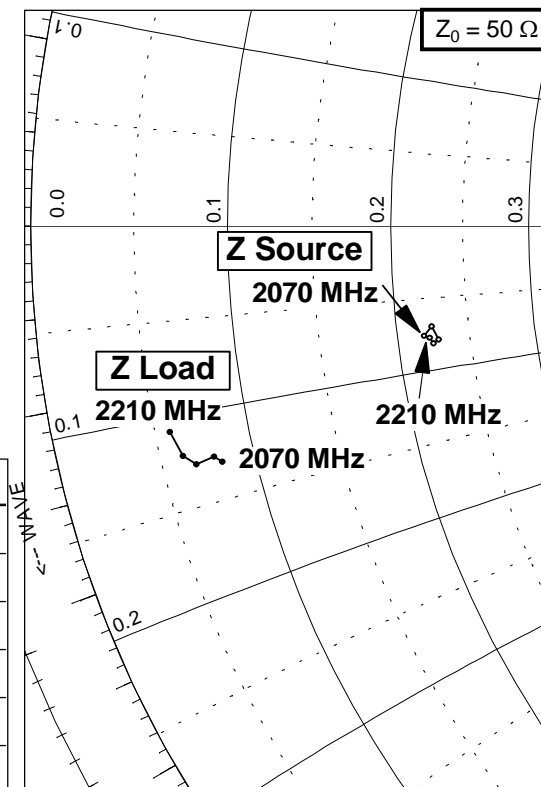
Typical Performance (cont.)

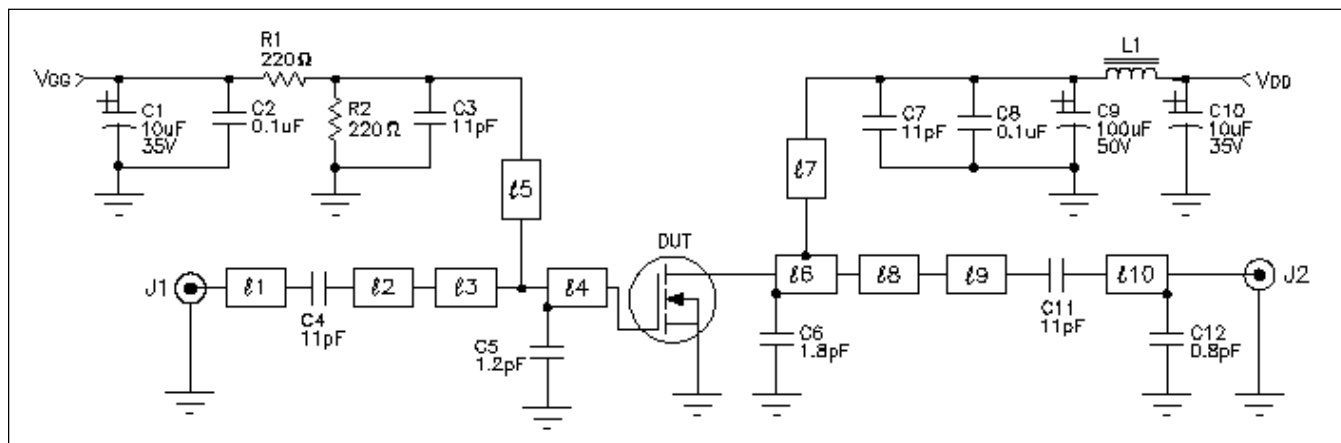


Broadband Circuit Impedance



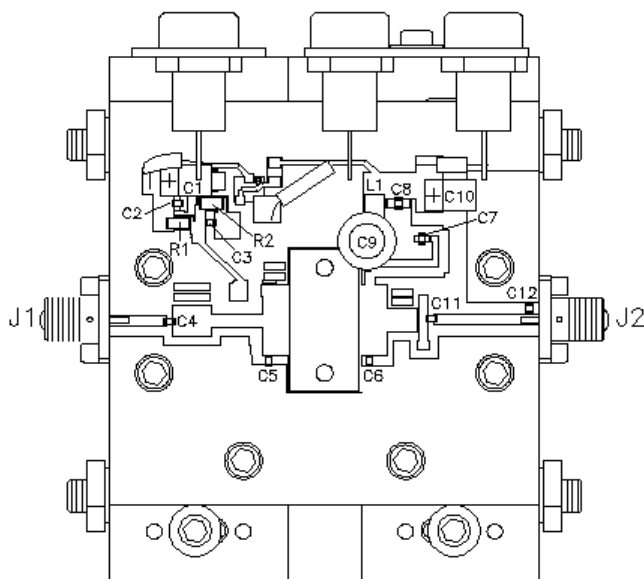
Frequency MHz	Z Source Ω		Z Load Ω	
	R	jX	R	jX
2070	10.9	-3.8	4.1	-6.5
2100	11.2	-3.5	3.9	-6.3
2140	11.4	-4.0	3.4	-6.4
2170	11.2	-4.1	3.1	-6.1
2210	11.1	-3.9	2.9	-5.4



Test Circuit


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

DUT	PTF 102015	LDMOS Device	C1, C10	Capacitor, 10 μF , 35V	Digi-Key PC56106-ND
$\ell 1$	0.187λ 2170 MHz	Microstrip 52 Ω	C2, C8	Capacitor, 0.1 μF , 50V	Digi-Key PCC103BCT-ND
$\ell 2$	0.074λ 2170 MHz	Microstrip 24 Ω	C3, C4, C7, C11	Capacitor, 11 pF	100A 110
$\ell 3$	0.093λ 2170 MHz	Microstrip 44.7 Ω	C5	Capacitor, 1.2 pF	100A 1R2
$\ell 4$	0.050λ 2170 MHz	Microstrip 12.25 Ω	C6	Capacitor, 1.8 pF	100A 1R8
$\ell 5$	0.125λ 2170 MHz	Microstrip 76.5 Ω	C9	Capacitor, 100 μF , 50 V	Digi-Key P5182-ND
$\ell 6$	0.051λ 2170 MHz	Microstrip 12.25 Ω	C12	Capacitor, 0.8 pF	100A 0R8
$\ell 7$	0.322λ 2170 MHz	Microstrip 52 Ω	R1, R2	Resistor, 220 Ω , 1/8 W	Digi-Key 220ECT-ND
$\ell 8$	0.057λ 2170 MHz	Microstrip 3.0 Ω	J1, J2	SMA Female Connector, Panel Mount	Philips 53/3/4.6-452
$\ell 9$	0.018λ 2170 MHz	Microstrip 15 Ω	L1	Ferrite, 6mm	Philips 53/3/4.6-452
$\ell 10$	0.105λ 2170 MHz	Microstrip 52 Ω	Circuit Board	.030" thick, 2 oz. copper	Cirexx TMM4



Test Circuit Assembly Drawing (not to scale)

Case Outline Specifications

