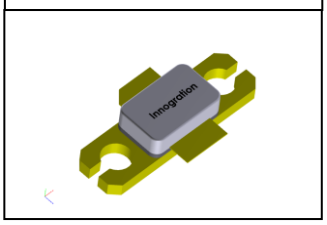
MU1503V LDMOS TRANSISTOR

Document Number: MU1503V
Preliminary Datasheet V1.3

1500MHz, 30W, 50V High Power RF LDMOS FETs

MU1503V



Description

The MU1503V is a 30-watt, highly rugged, unmatched LDMOS FET, designed for wide-band commercial and industrial applications at frequencies HF to 1.5 GHz.

- Typical Performance (On Innogration narrow band fixture with device soldered):

V_{DD} = 50 Volts, I_{DQ} = 100 mA, CW.

Frequency	Gp (dB)	P_{out} (W)	η_D@P_{out} (%)
915 MHz	24	36	60

- Typical Performance (On Innogration narrow band fixture with device soldered):

V_{DD} = 50 Volts, I_{DQ} = 100 mA, CW.

Frequency	Gp (dB)	P_{out} (W)	η_D@P_{out} (%)
162.5MHz	28	39	70

- Typical Performance (On Innogration narrow band fixture with device soldered):

V_{DD} = 50 Volts, I_{DQ} = 100 mA, CW.

Frequency	Gp (dB)	P_{out} (W)	η_D@P_{out} (%)
81.36MHz	21	40	73

Features

- High Efficiency and Linear Gain Operations
- Integrated ESD Protection
- Excellent thermal stability, low HCI drift
- Large Positive and Negative Gate/Source Voltage Range for Improved Class C Operation
- Pb-free, RoHS-compliant

Suitable Applications

- 2-30MHz (HF or Short wave communication)
- 30-88MHz (Ground communication)
- 54-88MHz (TV VHF I)
- 88-108MHz (FM)
- 118 -140MHz (Avionics)
- 136-174MHz (Commercial ground communication)
- 160-230MHz (TV VHF III)
- 30-512MHz (Jammer, Ground/Air communication)
- 470-860MHz (TV UHF)
- 100kHz - 1000MHz (ISM, instrumentation)

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DSS}	120	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+55	Vdc
Storage Temperature Range	Tstg	-65 to +150	°C
Case Operating Temperature	T_C	+150	°C
Operating Junction Temperature	T_J	+225	°C

Table 2. Thermal Characteristics

Characteristic	Symbol	Value	Unit
Thermal Resistance, Junction to Case T_C= 85°C, T_J=200°C, DC test	$R_{\theta JC}$	0.95	°C/W

Table 3. ESD Protection Characteristics

Test Methodology	Class
Human Body Model (per JESD22--A114)	Class 2

Table 4. Electrical Characteristics (TA = 25 ℃ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
DC Characteristics					
Drain-Source Voltage V_{GS}=0, I_{DS}=1.0mA	$V_{(BR)DSS}$		122		V
Zero Gate Voltage Drain Leakage Current (V_{DS} = 50V, V_{GS} = 0 V)	I_{DSS}	——	——	1	μA
Gate--Source Leakage Current (V_{GS} = 10 V, V_{DS} = 0 V)	I_{GSS}	——	——	1	μA
Gate Threshold Voltage (V_{DS} = 50V, I_D = 600 μA)	$V_{GS(th)}$	——	2.73	——	V
Gate Quiescent Voltage (V_{DD} = 50 V, I_D = 100 mA, Measured in Functional Test)	$V_{GS(Q)}$	——	3.57	——	V
Common Source Input Capacitance (V_{GS} = 0V, V_{DS} =50 V, f = 1 MHz)	C_{ISS}		28.3		pF
Common Source Output Capacitance (V_{GS} = 0V, V_{DS} =50 V, f = 1 MHz)	C_{OSS}		11.9		pF
Common Source Feedback Capacitance (V_{GS} = 0V, V_{DS} =50 V, f = 1 MHz)	C_{RSS}		0.38		pF

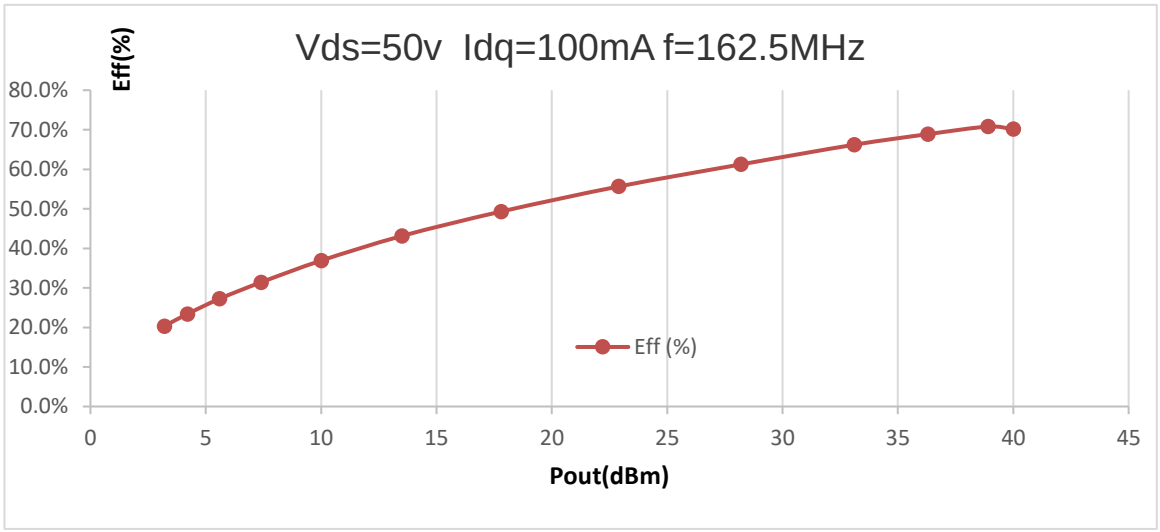
Functional Tests (In Demo Test Fixture, 50 ohm system) V_{DD} = 50 Vdc, I_{DQ} = 100mA, f = 915 MHz, CW Signal Measurements, Pin=21.5dBm

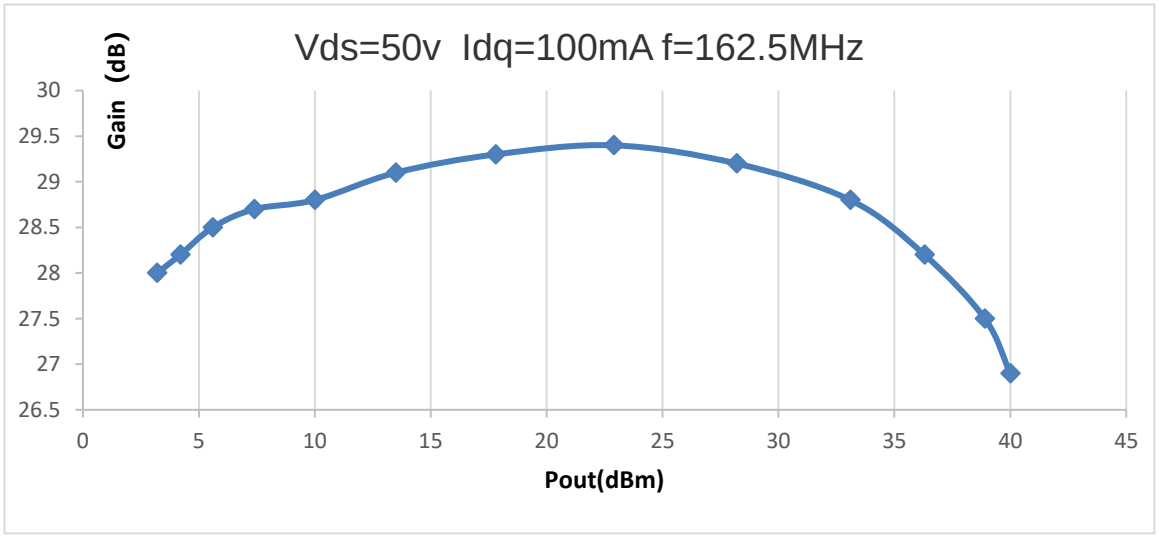
Power Gain@Pout	Gp	——	24	——	dB
Output Power	Pout	30	36		W
Drain Efficiency@Pout	η_D	——	60	——	%
Input Return Loss	IRL	——	-7	——	dB

TYPICAL CHARACTERISTICS

Figure 1: Pulsed CW Gain and Power Efficiency as a Function of Pout at 162.5MHz

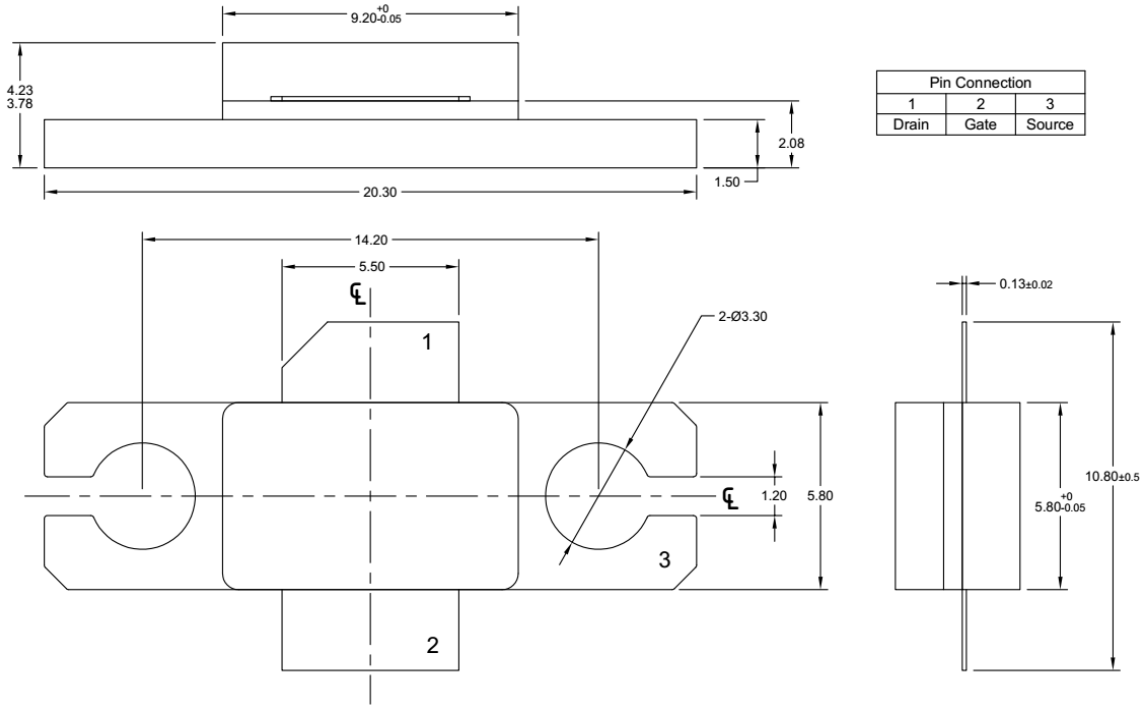
Signal：CW　Vgs=3.72V, Vds=50V, Idq=100mA





Package Outline

Flanged ceramic package; 2 leads



OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-GXB					10/10/2017

Figure 1. Package Outline PKG-G2E

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2017/7/18	V1.0	Preliminary Datasheet Creation
2021/1/15	V1.1	Add 162.5MHz data
2021/11/8	V1.2	Update package outline
2024/10/29	V1.3	Add 81.36MHz application data on 1st page

Application data based on GZY-19-07/HL-24-47

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