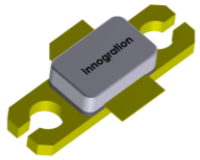
MU1020V LDMOS TRANSISTOR

HF-800MHz, 200W, 50V RF LDMOS FETs

MU1020V



Description

The MU1020V is a 200-watt, highly rugged, unmatched LDMOS FET, designed for wide-band commercial and industrial applications at frequencies HF to 800MHz.

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

CW , VDS=48V, VGS=3.3V, Idq=200mA

Freq(MHz)	Pin(dBm)	Pout(dBm)	IDS(A)	Gain(dB)	EFF(%)
410	36.3	53.1	7.4	16.8	57.5%
420	36.1	53.3	7.6	17.2	58.6%
440	36	53.5	7.7	17.5	60.6%
460	36.2	53.5	7.8	17.3	59.8%
480	36.2	53.8	8.4	17.6	59.5%
500	36.5	53.9	8.9	17.4	57.5%
520	36.8	54	9.3	17.2	56.3%
540	35.8	53.9	9.1	18.1	56.2%
560	34.9	53.7	8.4	18.8	58.1%
580	35	53.5	7.9	18.5	59.0%
600	36	53	6.9	17	60.2%

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	RθJC	0.58	°C/W

Table 3. ESD Protection Characteristics

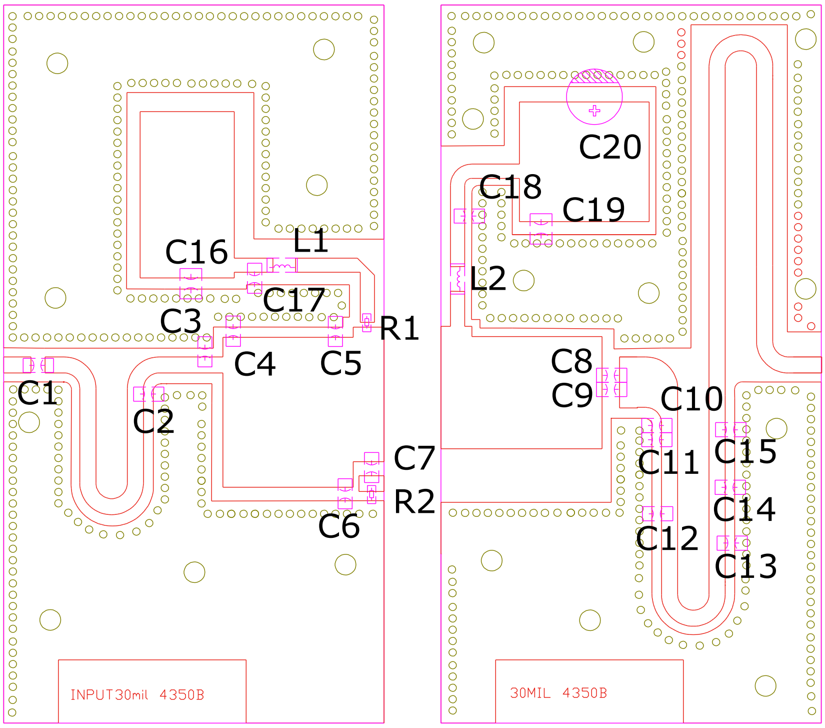
Test Methodology	Class
Human Body Model (per JESD22--A114)	Class 2

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 = 200 mA, Measured in Functional Test)	$V_{GS(Q)}$	——	3.3	——	V
Common Source Input Capacitance (V_{GS} = 0V, V_{DS} =50 V, f = 1 MHz)	C_{ISS}		150		pF
Common Source Output Capacitance (V_{GS} = 0V, V_{DS} =50 V, f = 1 MHz)	C_{OSS}		56		pF
Common Source Feedback Capacitance (V_{GS} = 0V, V_{DS} =50 V, f = 1 MHz)	C_{RSS}		1.6		pF
Functional Tests (In Demo Test Fixture, 50 ohm system) V_{DD} = 48 Vdc, I_{DQ} = 100mA, f = 600 MHz, CW Signal Measurements, Pin=36dBm					
Power Gain@Pout	Gp	——	17	——	dB
Output Power	Pout	30	200		W
Drain Efficiency@Pout	η_D	——	60	——	%
Input Return Loss	IRL	——	-7	——	dB

Reference Circuit of Test Fixture Assembly Diagram

410-600MHz Class AB (Layout file upon request,)

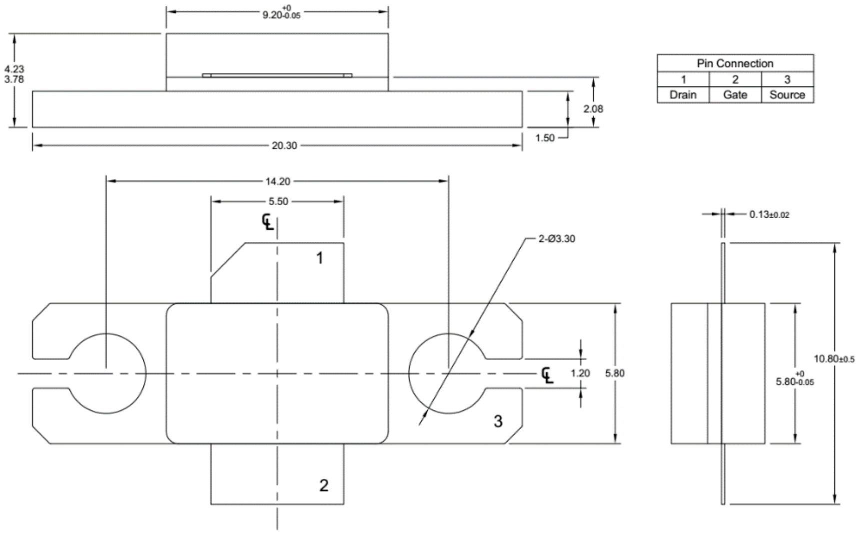


Test Circuit Component Designations and Values

Component	Description	Suggested Manufacturer
C1	100pF	ATC600F
C2,	15pF	ATC800B
C3	6.8pF	ATC800B
C4	20pF	ATC800B
C5, C6, C10	24pF	ATC800B
C8, C9, C17, C18	56pF	ATC600F
C11	8.2pF	ATC800B
C12	18pF	ATC800B
C13, C14	4.7pF	ATC800B
C15	3.3pF	ATC800B
C7, C16, C19	10uF 100V	Ceramic multilayer capacitor
C20	470uF,63V	Electrolytic Capacitor
R1, R2	9.1Ω， 1206	Chip Resistor
L1, L2	10nH	DIY air core inductance
PCB	0.762mm [0.030’’] thick, εr=3.50, Rogers 4350B, 1 oz. copper	

Package Outline

Flanged ceramic package; 2 leads



Unit：mm
Tolerances(unless specified)：x.x ±0.1
x.xx ±0.05

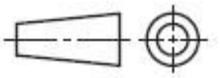
OUTLINE VERSION	REFERENCE			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA		
PKG-GXB					**10/10/2017**

Figure 1. Package Outline PKG-G2E

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2021/6/11	**V1.0**	**Preliminary Datasheet Creation**
2024/9/26	**V1.1**	**G2E package drawing finalized**

Application data based on TK-21-03

Disclaimers

Specifications are subject to change without notice. Innogration believes the information contained within this data sheet to be accurate and reliable. However, no responsibility is assumed by Innogration for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Innogration . Innogration makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose."Typical" parameters are the average values expected by Innogration in large quantities and are provided for information purposes only. These values can and do vary in different applications and actual performance can vary over time. All operating parameters should be validated by customer's technical experts for each application. Innogration products are not designed, intended or authorized for use as components in applications intended for surgical implant into the body or to support or sustain life, in applications in which the failure of the Innogration product could result in personal injury or death or in applications for planning, construction, maintenance or direct operation of a nuclear facility. For any concerns or questions related to terms or conditions, pls check with Innogration and authorized distributors

Copyright © by Innogration (Suzhou) Co.,Ltd.