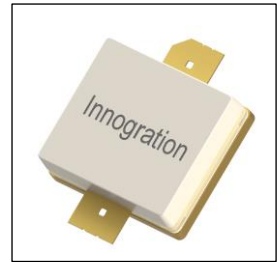


80W, HF to UHF, 28V High Power RF LDMOS FETs

Description

The ITGV10160A2C is a 80-watt capable, high performance, highly rugged, unmatched LDMOS transistor, designed for any general applications at frequencies from HF to UHF, in new generation highly cost effective open cavity package.



- Typical CW performance

$V_{DS}=28V$, $I_{DQ}=400mA$, $V_{GS}=3.45V$

Freq	P3dB	P3dB	P3dB Eff	P1dB Gain	P3.5dB	P3.5dB	P3.5dB Eff
(MHz)	(dBm)	(W)	%	dB	(dBm)	(W)	%
138	49.92	98.1	63.3	24.2	50.02	100.5	64.0
156	49.96	99.0	73.0	24.23	50.11	102.6	74.3
174	49.5	89.1	82.6	24.54	49.63	91.8	83.9

- Typical CW performance

$V_{DS}=28V$, $I_{DQ}=400mA$, $V_{GS}=3.45V$

Freq	P3dB	P3dB	P3dB Eff	P1dB Gain	P3.5dB	P3.5dB	P3.5dB Eff
(MHz)	(dBm)	(W)	%	dB	(dBm)	(W)	%
380	49.52	89.5	59.8	18.43	49.7	93.3	60.5
410	49.49	89.0	59.1	17.79	49.72	93.7	60.4
440	49.98	99.5	64.4	18.25	50.08	101.9	65.0
470	49.62	91.7	62.5	18.33	49.79	95.2	63.3
500	49.41	87.3	60.9	17.64	49.6	91.2	61.7
512	49.38	86.6	59.8	17.13	49.56	90.3	60.7

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

- 30-88MHz (Ground communication)
- 54-88MHz (TV VHF I)
- 88-108MHz (FM)
- 136-174MHz (Commercial ground communication)
- Laser Exciter
- Synchrotron
- MRI
- Plasma generator
- Weather Radar

Table 1. Maximum Ratings

Rating	Symbol	Value	Unit
Drain--Source Voltage	V_{DS}	+110	Vdc
Gate--Source Voltage	V_{GS}	-10 to +10	Vdc
Operating Voltage	V_{DD}	+55	Vdc
Storage Temperature Range	T_{stg}	-65 to +150	°C

ITGV10160A2C LDMOS TRANSISTOR

Document Number: ITGV10160A2C
Preliminary Datasheet V1.2

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 $T_c = 85^\circ\text{C}$, $T_j = 200^\circ\text{C}$, DC test	$R_{\theta JC}$	0.9	°C/W

Table 3. ESD Protection Characteristics

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

Table 4. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
----------------	--------	-----	-----	-----	------

DC Characteristics (per half section)

Drain-Source Voltage $V_{GS} = 0$, $I_{DS} = 1.0\text{mA}$	$V_{(BR)DSS}$		110		V
Zero Gate Voltage Drain Leakage Current ($V_{DS} = 75\text{V}$, $V_{GS} = 0\text{V}$)	I_{DSS}	—	—	1	μA
Zero Gate Voltage Drain Leakage Current ($V_{DS} = 28\text{V}$, $V_{GS} = 0\text{V}$)	I_{DSS}	—	—	1	μA
Gate--Source Leakage Current ($V_{GS} = 10\text{V}$, $V_{DS} = 0\text{V}$)	I_{GSS}	—	—	1	μA
Gate Threshold Voltage ($V_{DS} = 28\text{V}$, $I_D = 600\mu\text{A}$)	$V_{GS(th)}$	—	2.65	—	V
Gate Quiescent Voltage ($V_{DD} = 28\text{V}$, $I_D = 750\text{mA}$, Measured in Functional Test)	$V_{GS(Q)}$	—	3.5	—	V

Load Mismatch (In Innogration Test Fixture, 50 ohm system): $V_{DD} = 28\text{Vdc}$, $I_{DQ} = 750\text{mA}$, $f = 700\text{MHz}$, pulse width:100us, duty cycle:10%

Load 10:1 All phase angles, at 80W Pulsed CW Output Power	No Device Degradation
---	-----------------------

138-174MHz

TYPICAL CHARACTERISTICS

Figure 1: CW Gain and Power Efficiency as a Function of Pout at 390-430MHz

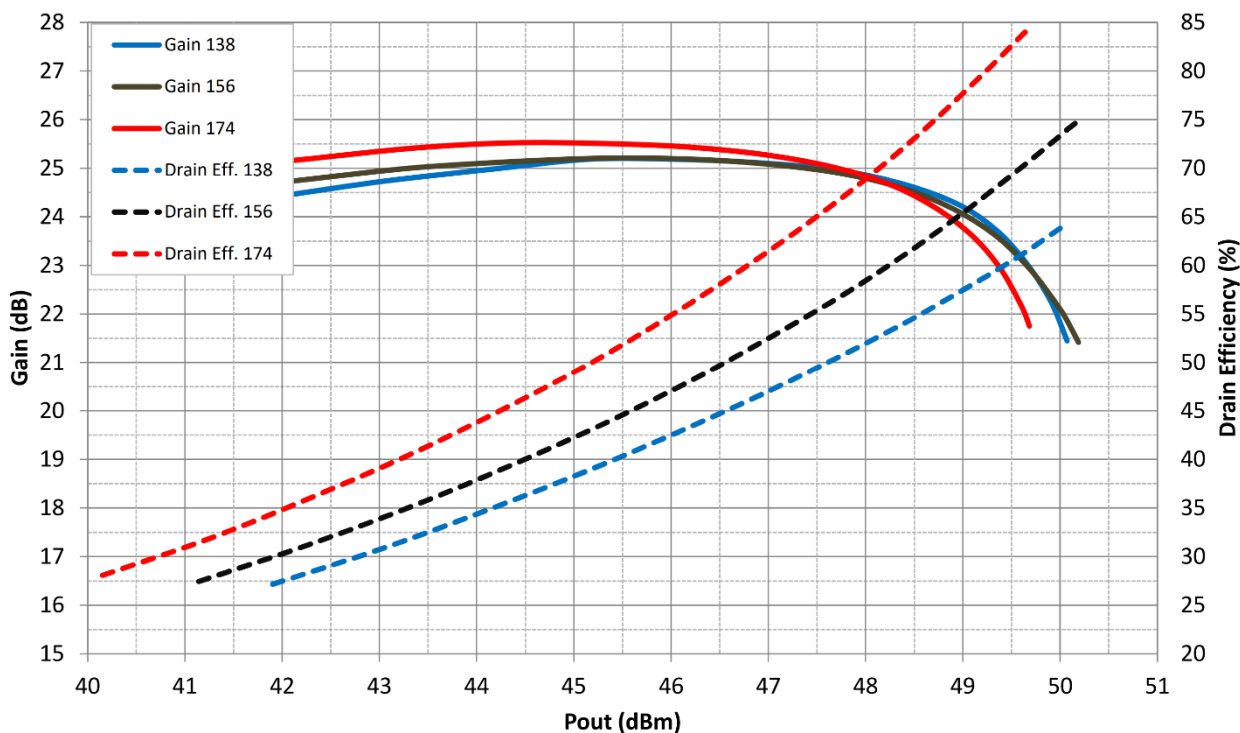
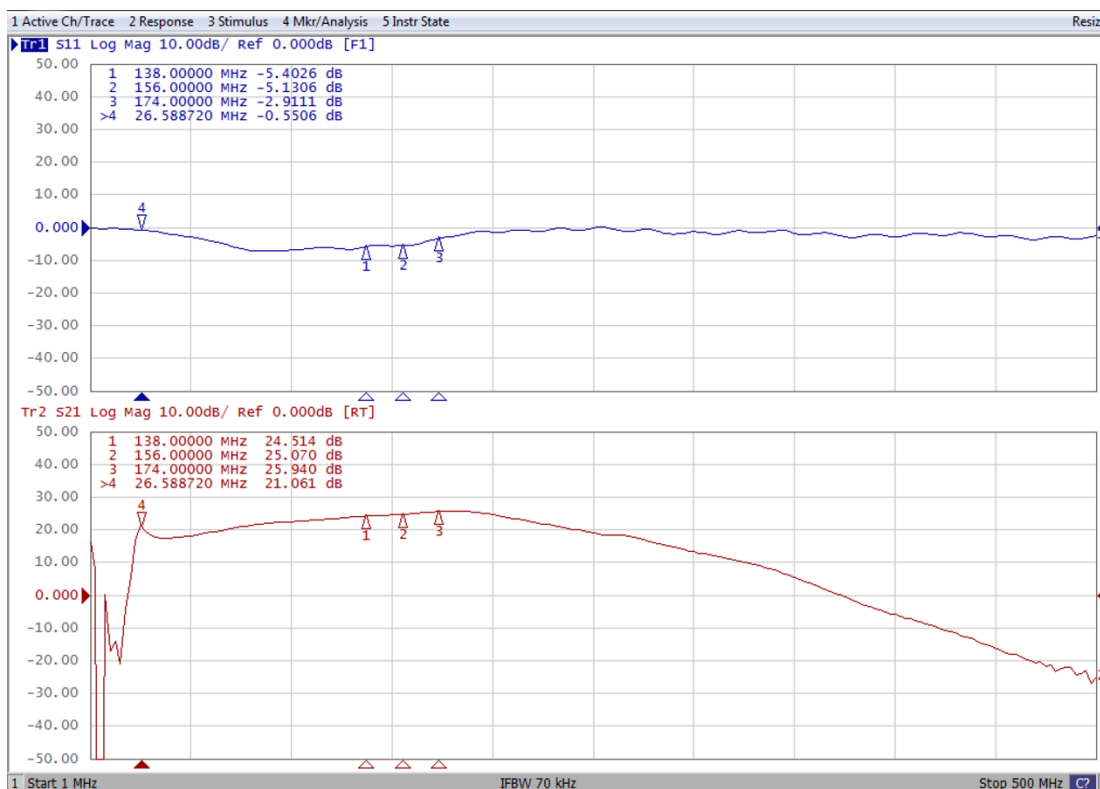


Figure 2: Network analyzer output S11/221



Reference Circuit of Test Fixture Assembly Diagram

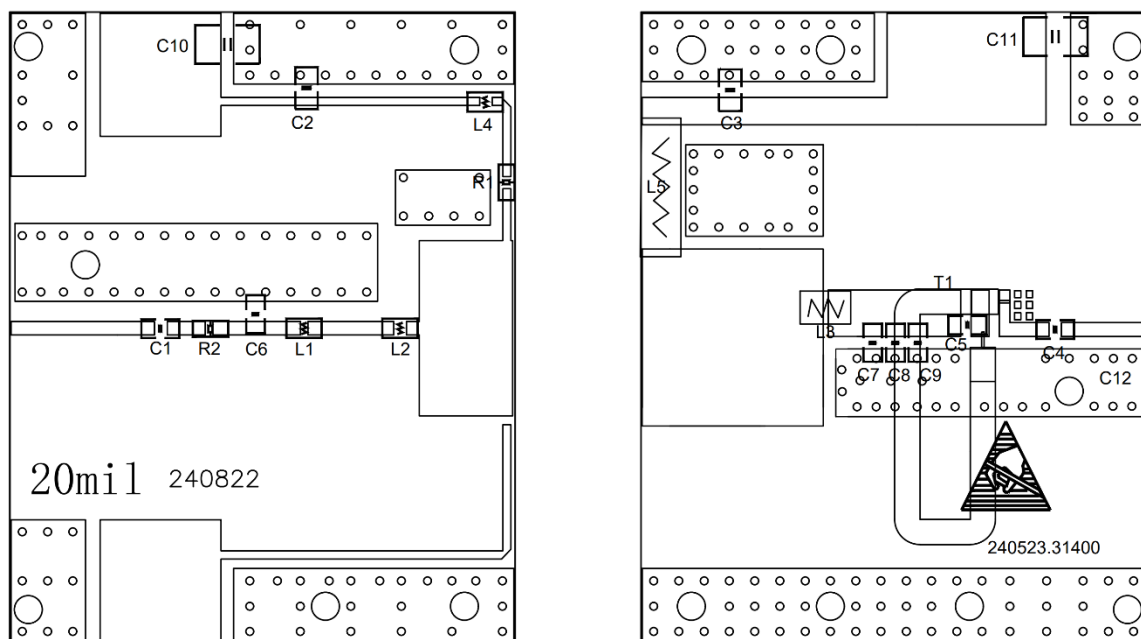


Table 5. Test Circuit Component Designations and Values

Reference	Footprint	Value	Quantity
C2, C3, C4, C5	0603	100pF/250V	4
C1	0603	33pF/250V	1
C6	0603	12pF/250V	1
L1, L2, L4	0603	18nH	3
C7, C9	0603	20pF/250V	2
C8	0603	39pF/250V	1
L3		1.1mm wire, 6.0mm inner diameter, 1 turn	1
T1		50ohm Coaxial line, length=110mm	1
C10, C11	1210	10uF/100V	2
L5		1.1mm wire, 4.1mm inner diameter, 12 turns	1
R1, R2	0603	10R	2
		ITGV10160A2C	1

380-512MHz

TYPICAL CHARACTERISTICS

Figure 3: CW Gain and Power Efficiency as a Function of Pout at 380-512MHz

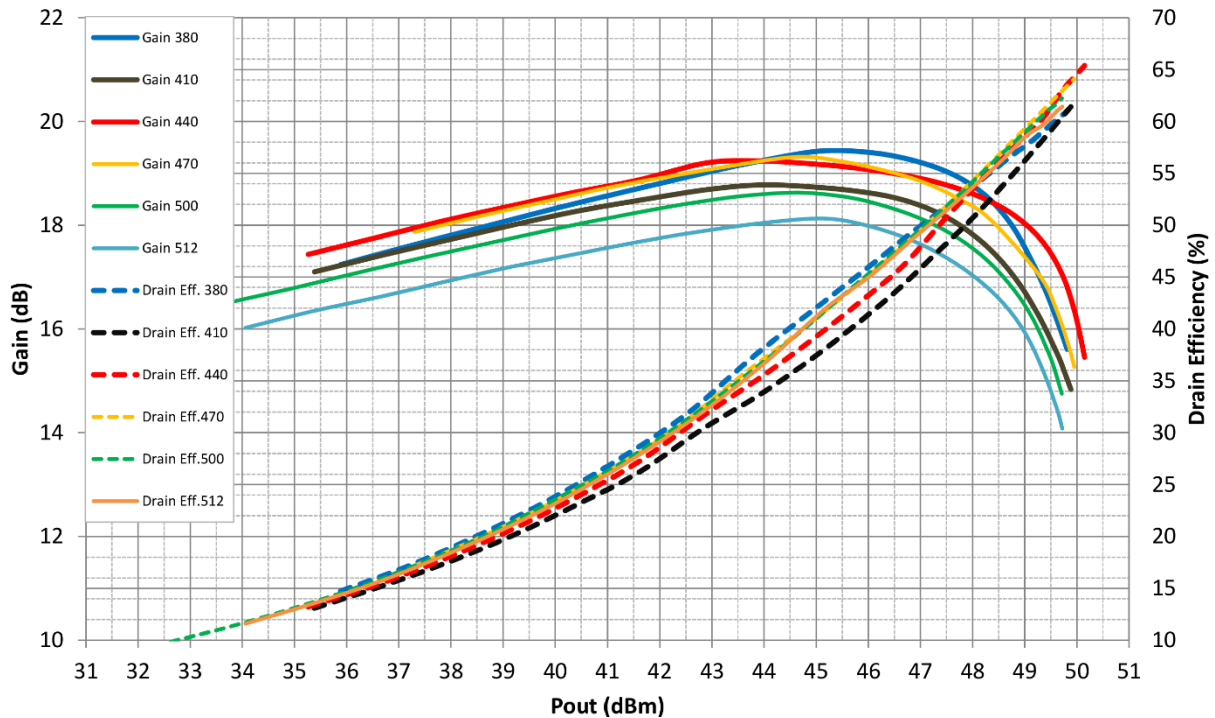
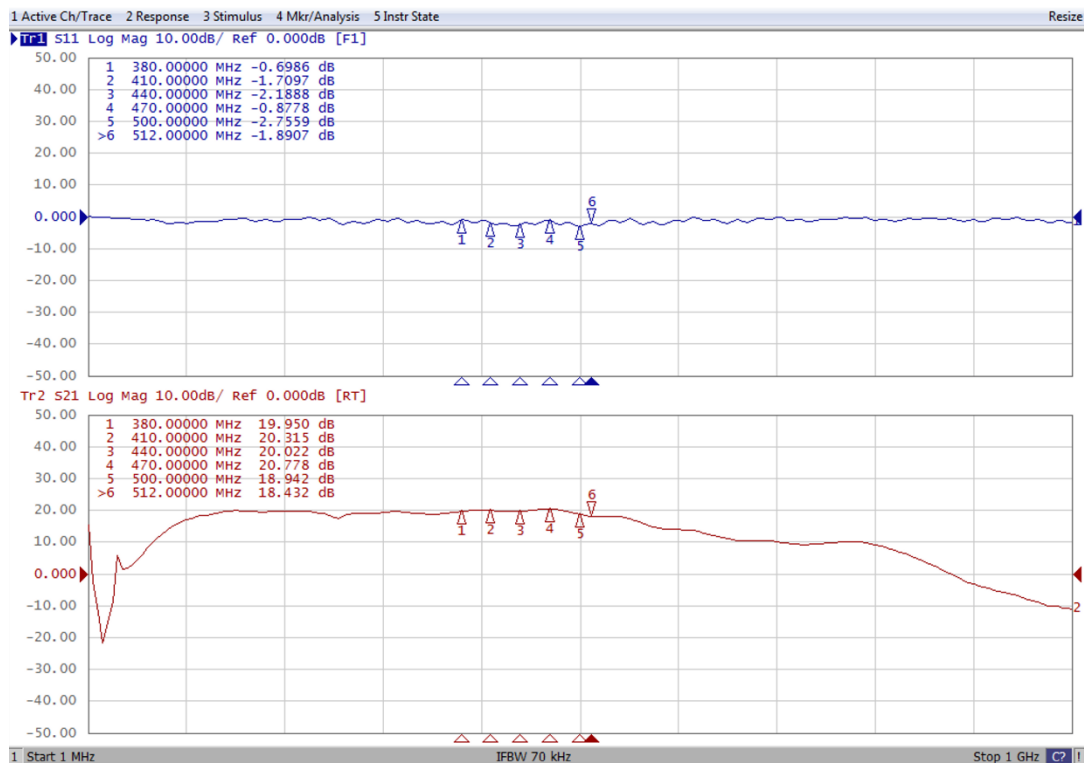


Figure 4: Network analyzer output S11/221



Reference Circuit of Test Fixture Assembly Diagram

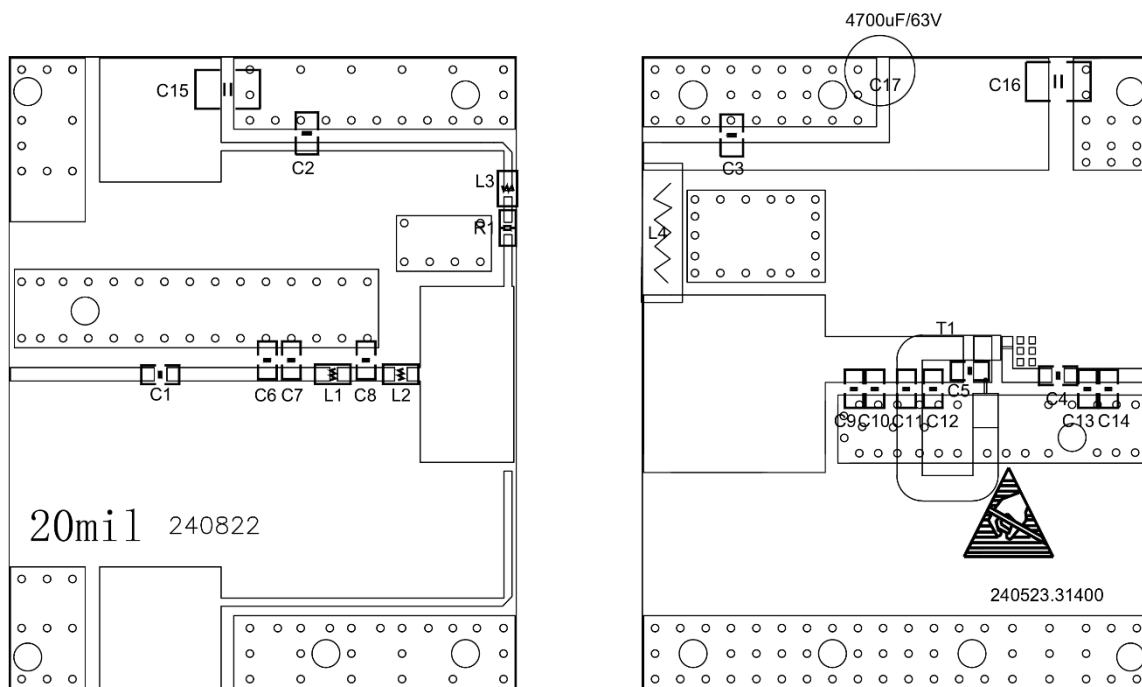
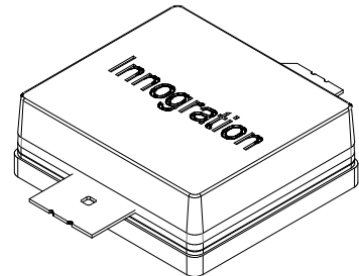
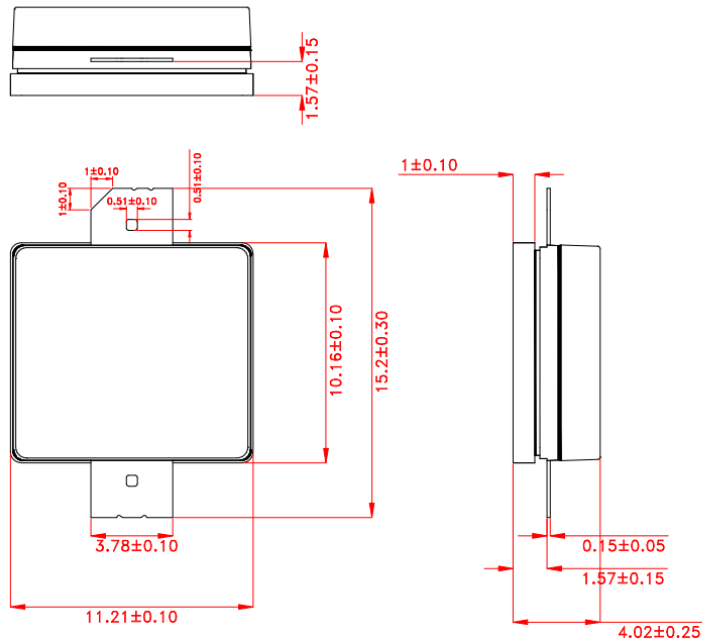


Table 6. Test Circuit Component Designations and Values

Reference	Footprint	Value	Quantity
C1, C2, C3, C4, C5	0603	100pF/250V	5
C6, C13, C14	0603	2.0pF/250V	3
C7	0603	5.1pF/250V	1
C8, C10, C11	0603	10pF/250V	3
L1, L2	0603	3.6nH	2
C9	0603	18pF/250V	1
C12	0603	5.6pF/250V	1
L3	0603	15nH	1
T1		50ohm Coaxial line, length=38mm	1
C15, C16	1210	10uF/100V	2
L5		1.1mm wire, 4.1mm inner diameter, 8 turns	1
R1	0603	10R	1
C17		4700uF/63V	1
		ITGV10160A2C	1

Package Dimensions



Unit:mm

Tolerance $\pm 0.10\text{mm}$, Except as Noted.

Revision history

Table 5. Document revision history

Date	Revision	Datasheet Status
2024/9/13	Rev 1.0	Preliminary Datasheet Creation
2024/12/18	Rev 1.1	Add 138-174MHz data
2024/12/25	Rev 1.2	Change the 2 nd carrier application to 380-512MHz

Application data based on ZYX-24-61/ZBB-24-57/ZBB-24-60

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.