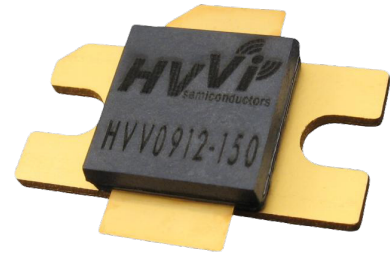


HVV0912-150 HIGH VOLTAGE, HIGH RUGGEDNESS

*L-Band Avionics Pulsed Power Transistor
960-1215 MHz, 10µs Pulse, 10% Duty Cycle
For Ground and Air DME, TCAS and IFF Applications*

FEATURES

- Silicon MOSFET Technology
- Operation from 24V to 50V
- High Power Gain
- Extreme Ruggedness
- Internal Input and Output Matching
- Excellent Thermal Stability
- All Gold Bonding Scheme



TYPICAL PERFORMANCE

High voltage vertical technology is well suited for high power pulsed applications in the L-Band including G-DME,A-DME, IFF,TCAS and Mode-S applications.

MODE	FREQUENCY (MHz)	VDD (V)	IDQ (mA)	Power (W)	GAIN (dB)	EFFICIENCY (%)	IRL (dB)	VSWR
Class AB	1215	50	50	150	20	43	-5	20:1

Table 1: Typical RF Performance in broadband test fixture at 25°C temperature with RF pulse conditions of pulse width = 10µs and pulse period = 100µs.

DESCRIPTION

The high power HVV0912-150 device is an enhancement mode RF MOSFET power transistor designed for pulsed applications in the L-Band from 960MHz to 1215MHz. The high voltage HVVFET™ technology produces over 150W of pulsed output power while offering high gain, high efficiency, and ease of matching with a 50 V supply. The vertical device structure assures high reliability and ruggedness as the device is specified to withstand a 20:1 VSWR at all phase angles under full rated output power.

ORDERING INFORMATION

Device Part Number: HVV0912-150

Demo Kit Part Number: HVV0912-150-EK

Available through Richardson Electronics (<http://rfwireless.rell.com/>)



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ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	Min	Typical	Max	Unit
$V_{BR(DSS)}$	Drain-Source Breakdown	VGS=0V, ID=5mA	95	102	-	V
I_{DSS}	Drain Leakage Current	VGS=0V, VDS=50V	-	50	200	μ A
I_{GSS}	Gate Leakage Current	VGS=5V, VDS=0V	-	1	5	μ A
G_P^1	Power Gain	F=1215MHz	18	20	-	dB
IRL^1	Input Return Loss	F=1215MHz	-	-5	-3.5	dB
η_D^1	Drain Efficiency	F=1215MHz	41	43		%
VGS(Q) ²	Gate Quiescent Voltage	VDD=50V, IDQ=50mA	1.1	1.45	1.8	V
VTH	Threshold Voltage	VDD=5V, ID=300 μ A	0.7	1.2	1.7	V

PULSE CHARACTERISTICS

Symbol	Parameter	Conditions	Min	Typical	Max	Unit
T_r^1	Rise Time	F=1215MHz	-	<17	50	nS
T_f^1	Fall Time	F=1215MHz	-	<27	50	nS
PD ¹	Pulse Droop	F=1215MHz	-	0.25	0.5	dB

THERMAL PERFORMANCE

Symbol	Parameter	Max	Unit
θ_{JC}^1	Thermal Resistance	0.13	$^{\circ}$ C/W

RUGGEDNESS PERFORMANCE

Symbol	Parameter	Test Condition	Max	Units
LMT ¹	Load Mismatch Tolerance	F = 1215 MHz	20:1	VSWR

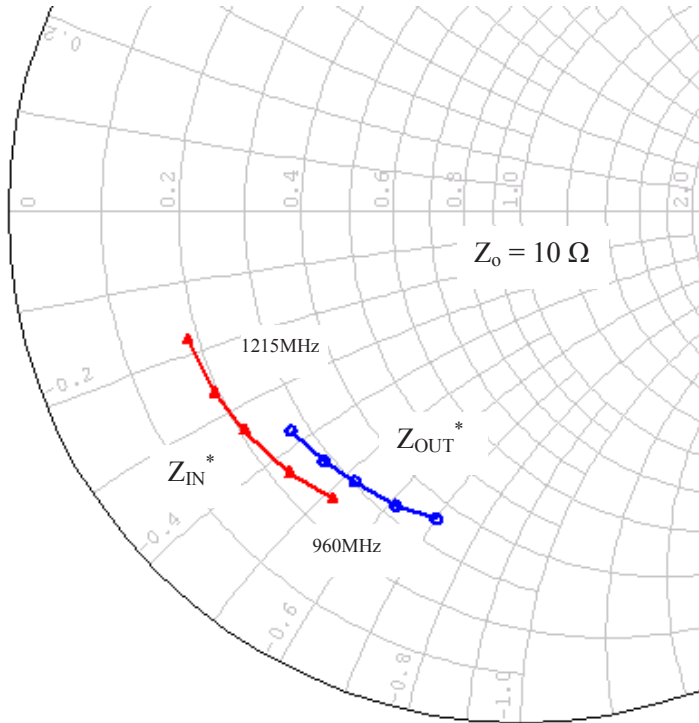
The HVV0912-150 device is capable of withstanding an output load mismatch corresponding to a 20:1 VSWR at rated output power and nominal operating voltage across the frequency band of operation.

¹NOTE: All parameters measured under pulsed conditions at 150W output power measured at the 10% point of the pulse with pulse width = 10 μ sec, duty cycle = 10% and VDD = 50V, IDQ = 50mA in a broad-band matched test fixture.

²NOTE: Amount of gate voltage required to attain nominal quiescent current.

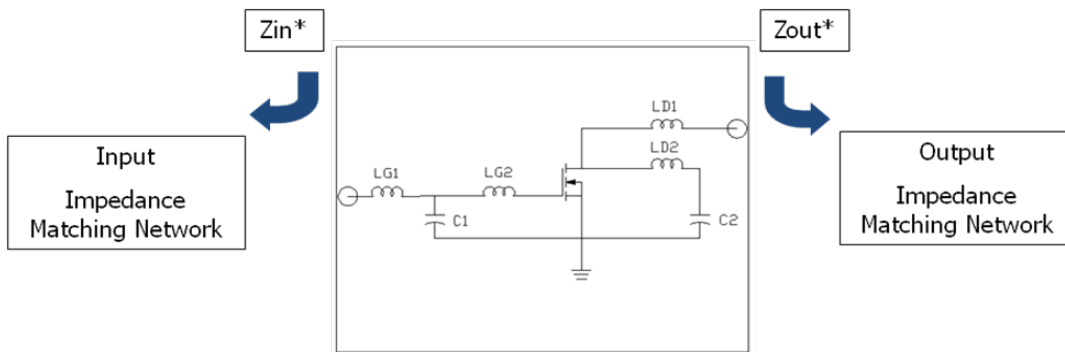
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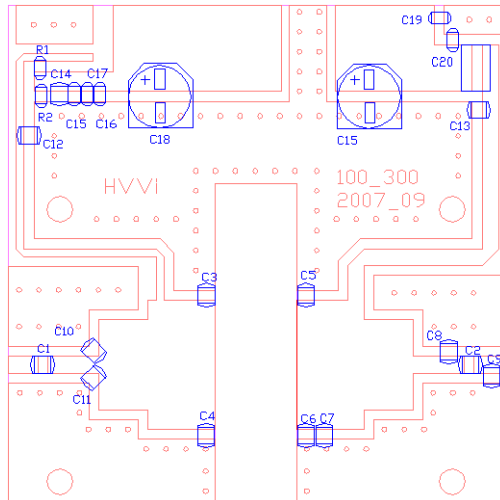
Test Circuit Impedance

Frequency	Z _{in} *(ohms)	Z _{out} *(ohms)
960MHz	2.51-j5.15	3.56-j7.01
1025MHz	2.27-j4.33	3.25-j6.14
1087.5MHz	2.07-j3.37	3.04-j5.21
1150MHz	1.93-j2.66	2.86-j4.54
1215MHz	1.85-j1.80	2.7-j3.77



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Demonstration Board Outline



Demonstration Circuit Board Picture

(AutoCAD Files for Demonstration Board available online at www.hvvi.com/products)

Part	Description	Part Number	Manufacturer
C1,C2,C13 :	39.0 pF ATC 100B Chip Capacitor	100B390JP500X	ATC
C14:	1.0 uF, 100V Chip Capacitor (X7R 1210)	GRM32ER72A105MA01L	Murata
C15, C19:	10K pF 100V Chi Capacitor (X7R 1206)	C1206C103K1RACTU	Kemet
C16, C20:	1K pF 100V Chi Capacitor (X7R 1206)	C1206C102K1RACTU	Kemet
C14:	47 pF ATC 100B Chip Capacitor	100B470JP500X	ATC
R1:	10 Ohms Chip Resistor (1206) SMD	RC1206JR-07100KL	DIGI-KEY
R2:	1.0 K Ohms Chip Resistor (1206) SMD	RC1206JR-07102KL	DIGI-KEY
C3:	2.2 pF ATC 100B Chip Capacitor	100B2R2JP500X	ATC
C4, C5:	2.0 pF ATC 100B Chip Capacitor	100B2R0JP500X	ATC
C6:	2.7 pF ATC 100B Chip Capacitor	100B2R7JP500X	ATC
C7, C9:	1.0 pF ATC 100B Chip Capacitor	100B1R0JP500X	ATC
C8:	1.8 pF ATC 100B Chip Capacitor	100B1R8JP500X	ATC
C10, C11:	3.3 pF ATC 100B Chip Capacitor	100B3R3JP500X	ATC
C12:	15.0 pF ATC 100B Chip Capacitor	100B150JP500X	ATC
C18:	10uF 63V Elect FK SMD	EEV-FK1J100P	Panasonic
C15:	220uF 63V Elect FK SMD	EEV-FK1J221Q	Panasonic
RF Connectors (2)	Type "N" RF connectors	5919CC-TB-7	Coaxicom
DC Drain Conn	Connector Jack Banana Nylon Red	J151-ND	DIGI-KEY
DC Ground Conn.	Connector Jack Banana Nylon Black	J152-ND	DIGI-KEY
DC Gate Conn.	Connector Jack Banana Nylon Green	J153-ND	DIGI-KEY
PCB Board	PCB: Arlon, 30 mils thick, 2.55 Dielectric, 2 oz Copper	DS2346	DS Electronics
Heat Sink	Cool Innovations Aluminum Heat Sink	3-252510RS3411	Cool Innovation
Device Clamp	Cool Innovations Nylon Clamp Foot	FXT000158 Rv.B	Cool Innovation
S.S. Screws (3)	4-40 X 1/4 Stainless Steel Hex Head Socket Screws	P242393	Copper State Bolt
Alloy Screws (4)	4-40 X 1/2 Alloy Socket Cap screw Hex Head	SCAS-0440-08C	Small Parts Inc
Metal Washers(4)	#4 Washer Zinc PLTD Steel Lock	ZSLW-004-M	Small Parts Inc

HVV1012-250 Demonstration Circuit Board Bill of Materials

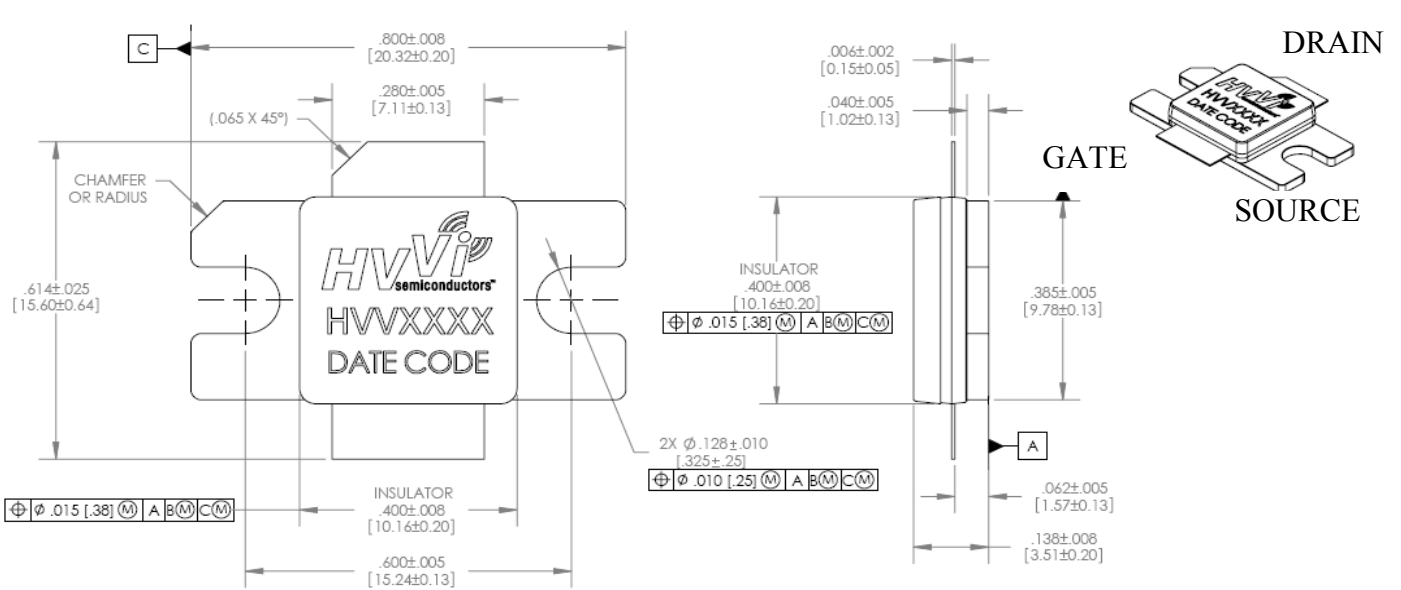


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PACKAGE DIMENSIONS



Note: Drawing is not actual size.

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