HVV0912-450

450 Watts, 50V, 960-1215MHz
10µs Pulse, 10% Duty

DESCRIPTION

The high power HVV0912-450 device is a high voltage silicon enhancement mode RF transistor designed for L-band pulsed avionics applications operating over the frequency range of 960 MHz and 1215 MHz.

FEATURES

High Power Gain
Excellent Ruggedness
50V Supply Voltage

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	95	V
V_{GS}	Gate-Source Voltage	-10 to +10	V
I_{DSX}	Drain Current	40	A
P_D[2]	Power Dissipation	1500	W
T_S	Storage Temperature	-65 to +150	°C
T_J	Junction Temperature	200	°C

THERMAL CHARACTERISTICS

Symbol	Parameter	Max	Unit
θ_{JC}[1]	Thermal Resistance	0.05	°C/W

PACKAGE

The device utilizes a RoHS compliant flanged package with a ceramic lid. The HV800 package style is qualified for gross leak test – MIL-STD-883, Method 1014.

RUGGEDNESS

The HVV0912-450 device is capable of withstanding an output load mismatch corresponding to a 20:1 VSWR at rated output power over all phase angles and operating voltage across the frequency band of operation.

Symbol	Parameter	Test Condition	Max	Units
LMT[1]	Load Mismatch Tolerance	P_{OUT} = 450W F = 960 MHz	20:1	VSWR

ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	Typ	Units
$V_{BR(DSS)}$	Drain-Source Breakdown	V_{GS}=0V,I_D=10mA	102	V
I_{DSS}	Drain Leakage Current	V_{GS}=0V,V_{DS}=50V	<500	µA
I_{GSS}	Gate Leakage Current	V_{GS}=5V,V_{DS}=0V	<10	µA
G_P[1]	Power Gain	P_{OUT}=450W,F=960 MHz	16.0	dB
IRL[1]	Input Return Loss	P_{OUT}=450W,F=960 MHz	7.5	dB
η_D[1]	Drain Efficiency	P_{OUT}=450W,F=960 MHz	50	%
PD[1]	Pulse Droop	P_{OUT}=450W,F=960 MHz	<0.25	dB

[1]Under Pulse Conditions: Pulse Width = 10µs, Pulse Period = 100µs at V_{DD} = 50V, I_{DQ} = 100mA
[2]Rated at T_{CASE} = 25°C

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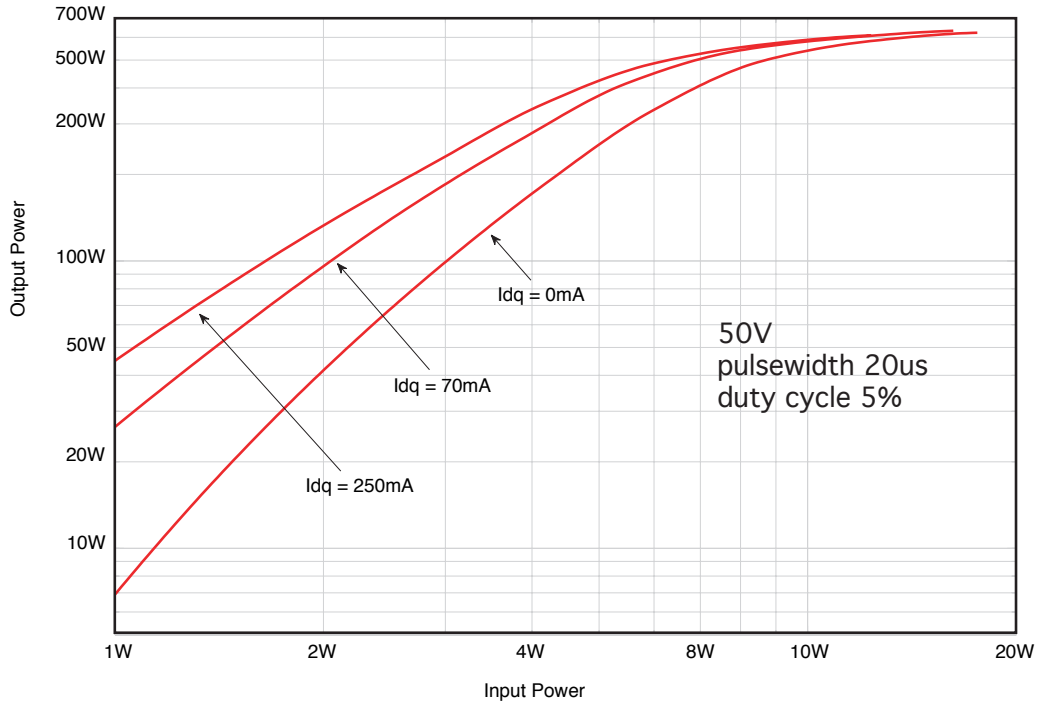
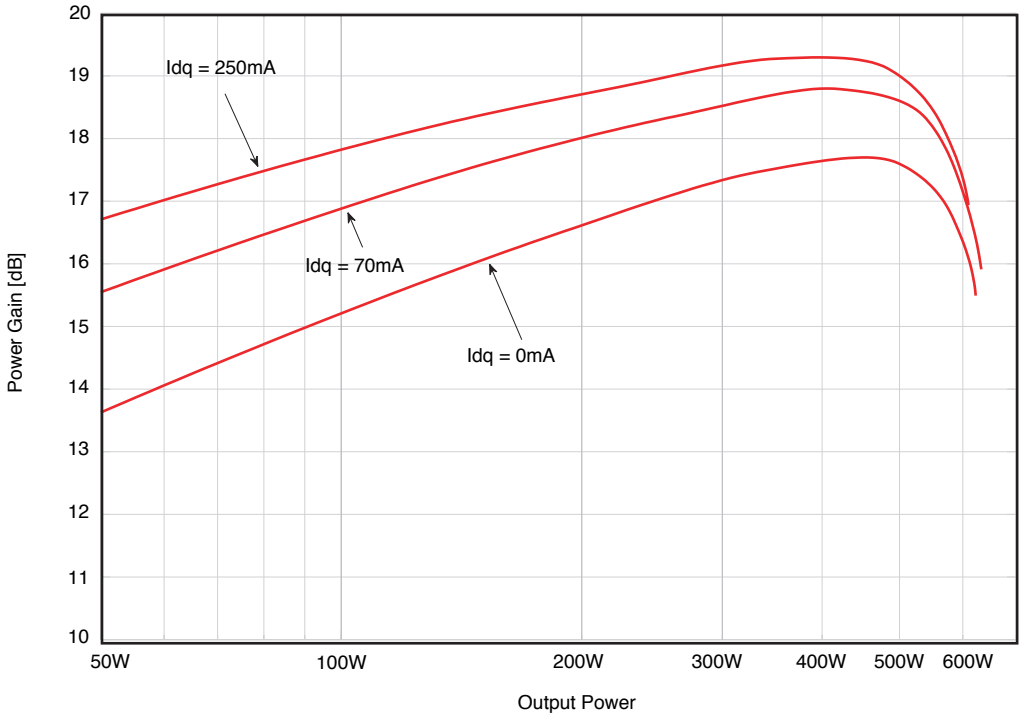
RF Performance at 1090 MHz





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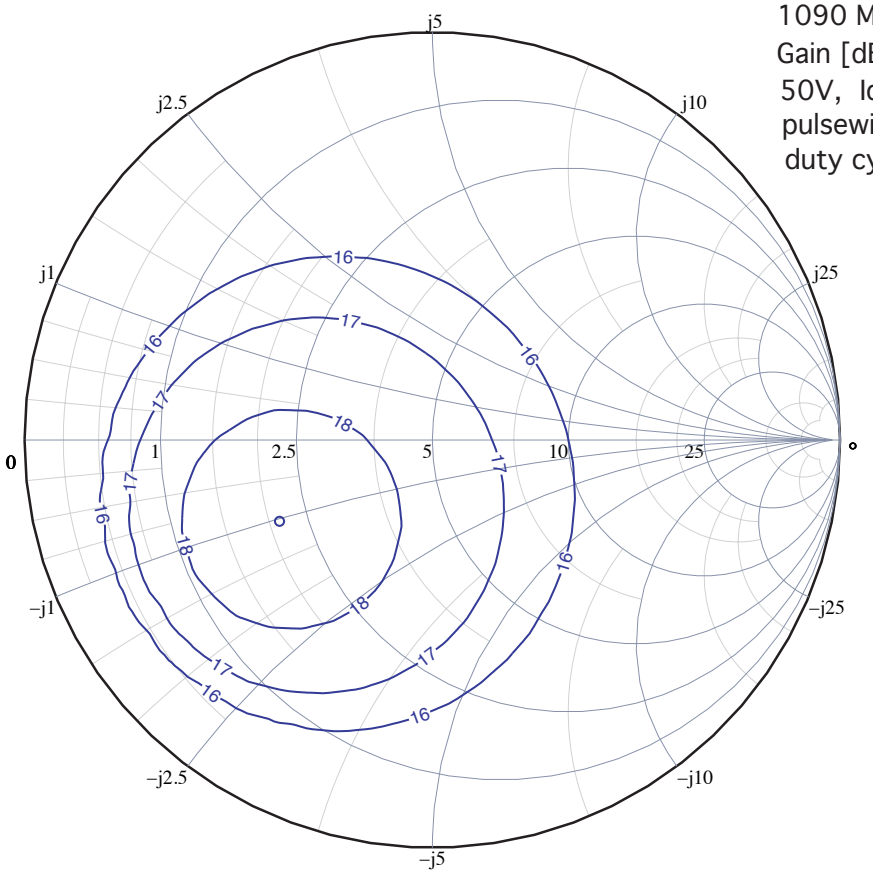
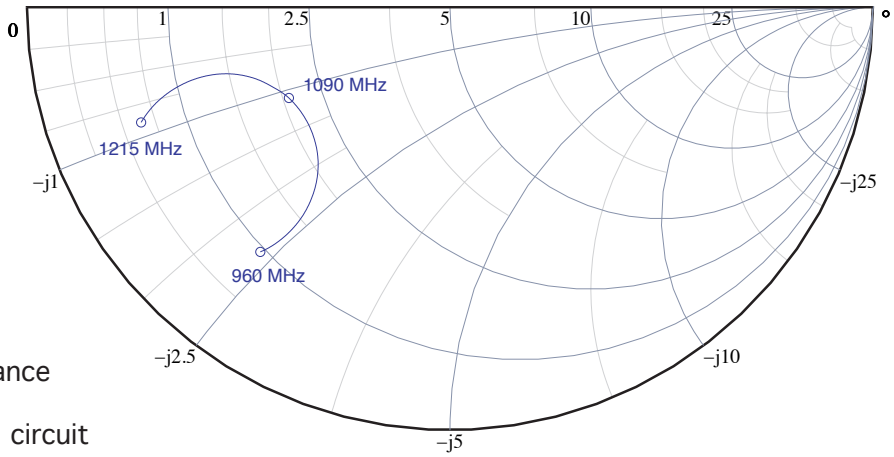


Impedance presented to the input of the device & associated RF Gain performance



Desired impedance targets of the input matching circuit

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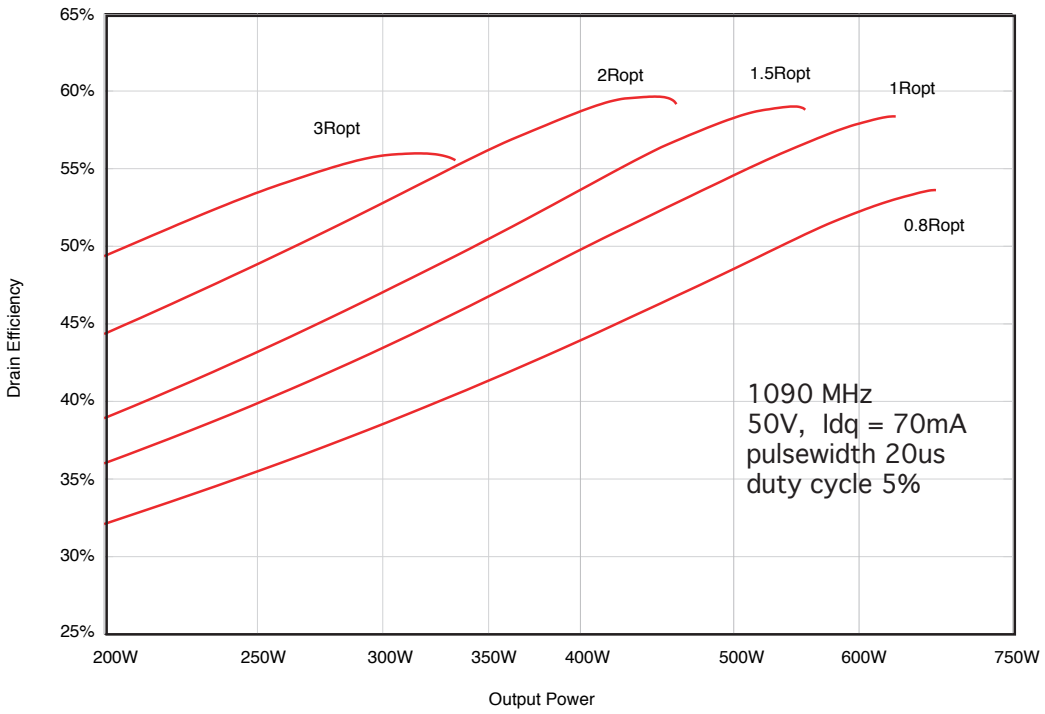
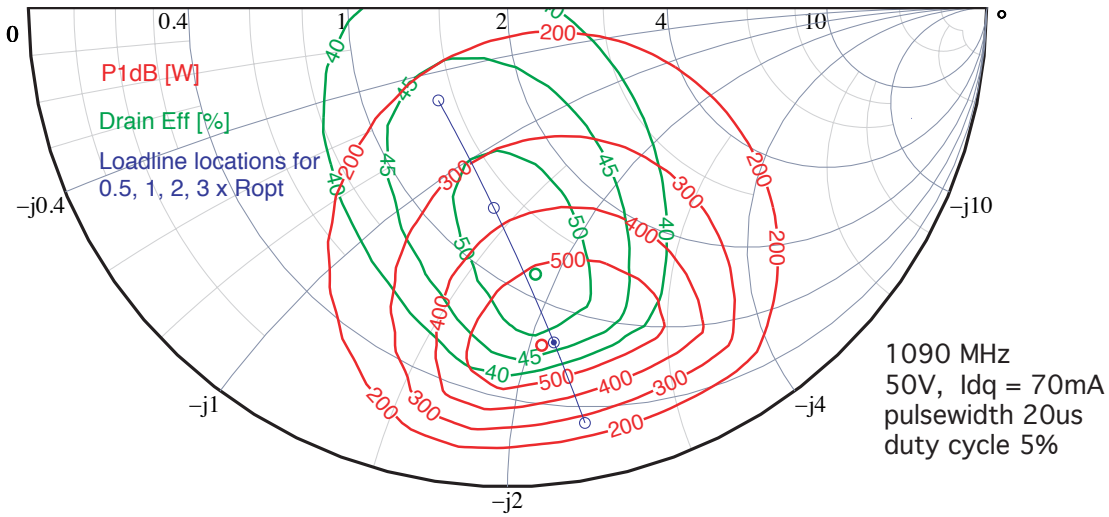
Drain Efficiency vs P_{out}





Impedance presented to the output of the device & associated RF output power & Eff performance

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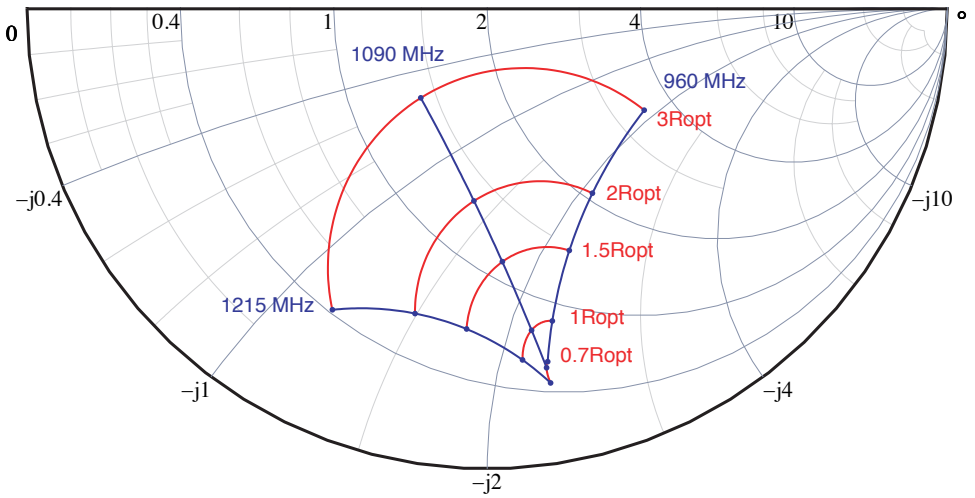
Impedance Target Selection

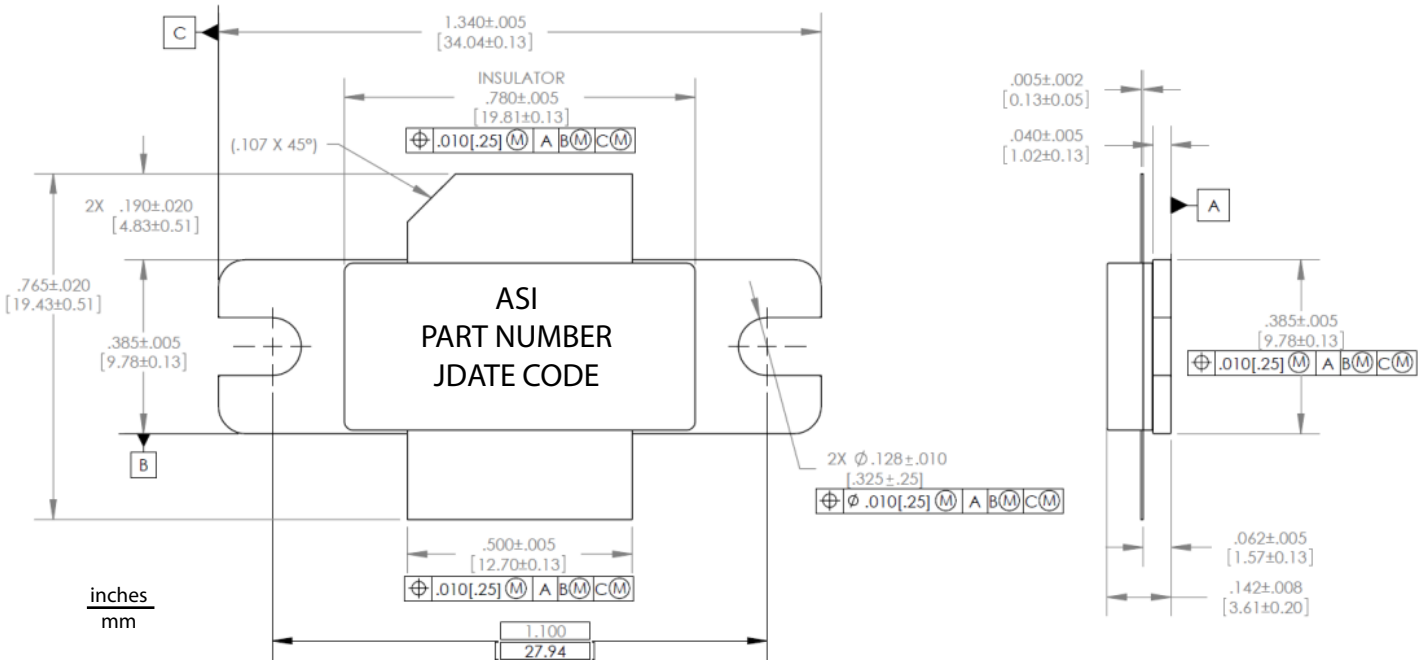
Table of loadline values preselected for best efficiency
Refer to impedance targets below based on the selected loadline value of Ropt

50V | 0mA | 70mA | 200mA

P_{out}	P_{in} 5W	8W	10W	12W	16W
600W			$1R_{opt}$ 60%	$1R_{opt}$ 55%	$1R_{opt}$ 55%
550W		$1R_{opt}$ 55%	$1R_{opt}$ 55%	$1.5R_{opt}$ 60%	$1.5R_{opt}$ 60%
500W		$1R_{opt}$ 55%	$1.7R_{opt}$ 60%	$1.7R_{opt}$ 60%	
450W	$1.5R_{opt}$ 55%	$1.5R_{opt}$ 55%	$2R_{opt}$ 55%	$2R_{opt}$ 60%	
400W	$2R_{opt}$ 55%	$2R_{opt}$ 60%	$2.5R_{opt}$ 55%		
350W	$2R_{opt}$ 55%	$1.7R_{opt}$ 55%			



PACKAGE DIMENSIONS



Note: Drawing is not actual size.