Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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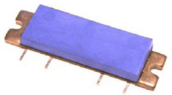
XD010-04S-D4F(Y)

350MHz to 600MHz CLASS AB 12W POWER AMPLIFIER MODULE

RFMD Green, RoHS Compliant, Pb-Free (Y Part Number)
Package: D



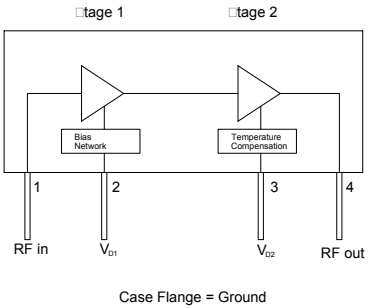
Product Description

RFMD's XD010-04S-D4F 12W power module is a robust broadband 2-stage Class A/AB amplifier, suitable for use as a power amplifier driver or output stage. The power transistors are fabricated using RFMD's latest, high performance LDMOS process. It is a drop-in, no-tune solution for high power applications requiring high efficiency, excellent linearity, and unit-to-unit repeatability. Internal bias current compensation ensures stable performance over a wide temperature range. It is internally matched to 50Ω.

Optimum Technology Matching® Applied

- ☐ GaAs HBT
- ☐ GaAs MESFET
- ☐ InGaP HBT
- ☐ SiGe BiCMOS
- ☐ Si BiCMOS
- ☐ SiGe HBT
- ☐ GaAs pHEMT
- ☐ Si CMOS
- ☐ Si BJT
- ☐ GaN HEMT
- ☐ InP HBT
- ☐ RF MEMS
- ✓ LDMOS

Functional Block Diagram



Case Flange = Ground

Features

- Available in RoHS Compliant Packaging
- 50W RF Impedance
- 12W Output P1dB
- Single Supply Operation: Nominally 28V
- High Gain: 32dB at 450MHz
- High Efficiency: 30% at 450MHz
- Robust 8000V ESD (HBM), Class 3B
- XeMOS II LDMOS FETS
- Temperature Compensation

Applications

- DTV
- Public Service
- Wireless Infrastructure
- Military Communications

Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Frequency of Operation	350		600	MHz	
Output Power at 1dB Compression		12		W	450MHz
Gain	30	32		dB	10W Output Power, 450Mhz
Peak to Peak Gain Variation		1.0	2.0	dB	350MHz to 600MHz
Drain Efficiency	26	30		%	10W CW, 350MHz to 600MHz
Input Return Loss	10	15		dB	350MHz to 600MHz
Third Order IMD		-32	-28	dBc	10W PEP (Two Tone), 450MHz and 451MHz
Signal Delay from Pin 1 to Pin 4		2.5		nS	
Deviation from Linear Phase (Peak to Peak)		0.5		Deg	
Thermal Resistance Stage 1 (Junction to Case)		11		°C/W	
Thermal Resistance Stage 2 (Junction to Case)		4		°C/W	

Test Conditions: $Z_{IN}=Z_{OUT}=50\Omega$ $V_{DD}=28.0V$ $I_{DQ1}=230mA$ $I_{DQ2}=150mA$ $T_{FLANGE}=25°C$

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Absolute Maximum Ratings

Parameter	Rating	Unit
1st Stage Bias Voltage (V_{D1})	35	V
2nd Stage Bias Voltage (V_{D2})	35	V
RF Input Power	+20	dBm
Load Impedance for Continuous Operation Without Damage	5:1	VSWR
Output Device Channel Temperature	+200	°C
Operating Temperature Range	-20 to +90	°C
Storage Temperature Range	-40 to +100	°C
ESD Rating - Human Body Model, JEDEC Document - JESD22-A114-B	8000	V
MTTF - 85°C Leadframe, 200°C Channel	1.2×10^6	Hours

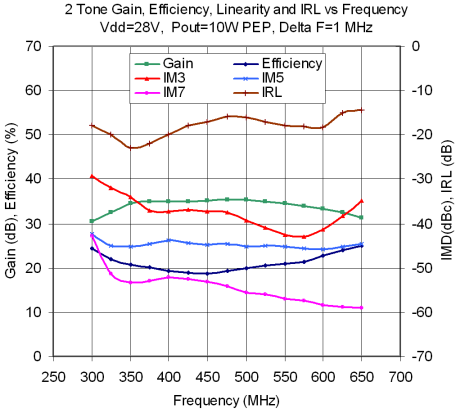
Operation of this device beyond any one of these limits may cause permanent damage. For reliable continuous operation, the device voltage and current must not exceed the maximum operating values specified in the table on page one.

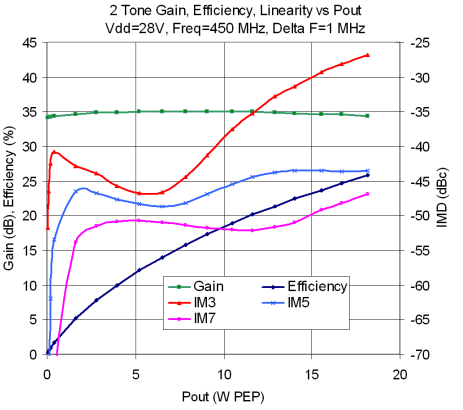
Caution! ESD sensitive device.

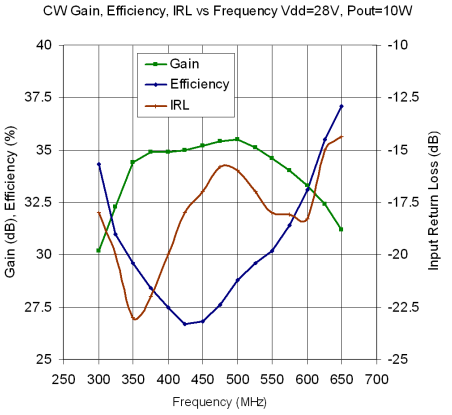
Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

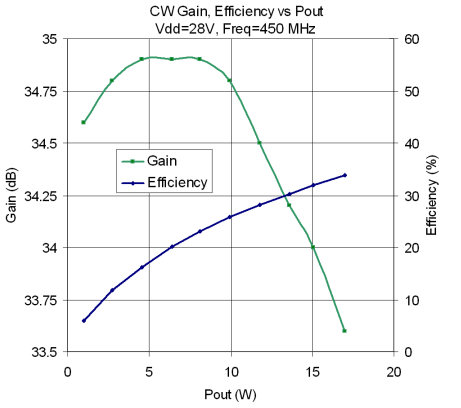
RoHS status based on EUDirective2002/95/EC (at time of this document revision).

Typical Performance Curves









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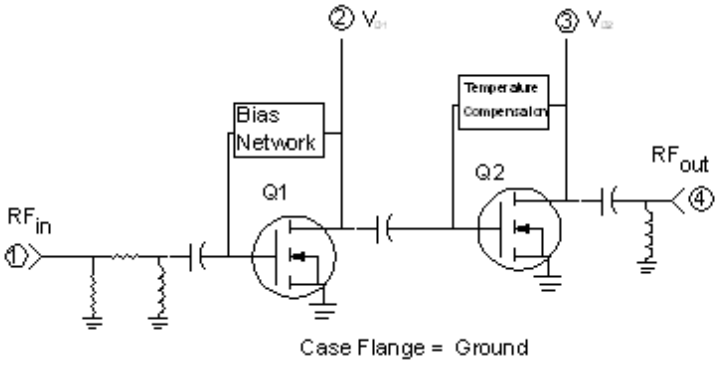
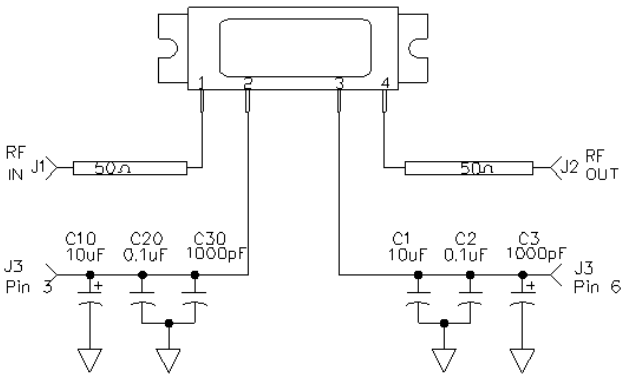
Simplified Device Schematic



Test Board Schematic with module connections shown



Test Board Bill of Materials

Component	Description	Manufacturer
PCB	Rogers 4350, ε_r=3.5, Thickness=30mils	Rogers
J1, J2	SMA, RF, Panel Mount Tab W / Flange	Johnson
J3	MTA Post Header, 6 Pin, Rectangle, Polarized, Surface Mount	AMP
C1, C10	Cap, 10μF, 35V, 10%, Tant, Elect, D	Kemet
C2, C20	Cap, 0.1μF, 100V, 10%, 1206	Johanson
C3, C30	Cap, 1000pF, 100V, 10%, 1206	Johanson
C25, C26	Cap, 68pF, 250V, 5%, 0603	ATC
C21, C22	Cap, 0.1mF, 100V, 10%, 0805	Panasonic
C23, C24	Cap, 1000pF, 100V, 10%, 0603	AVX
Mounting Screws	4-40 X 0.250"	Various

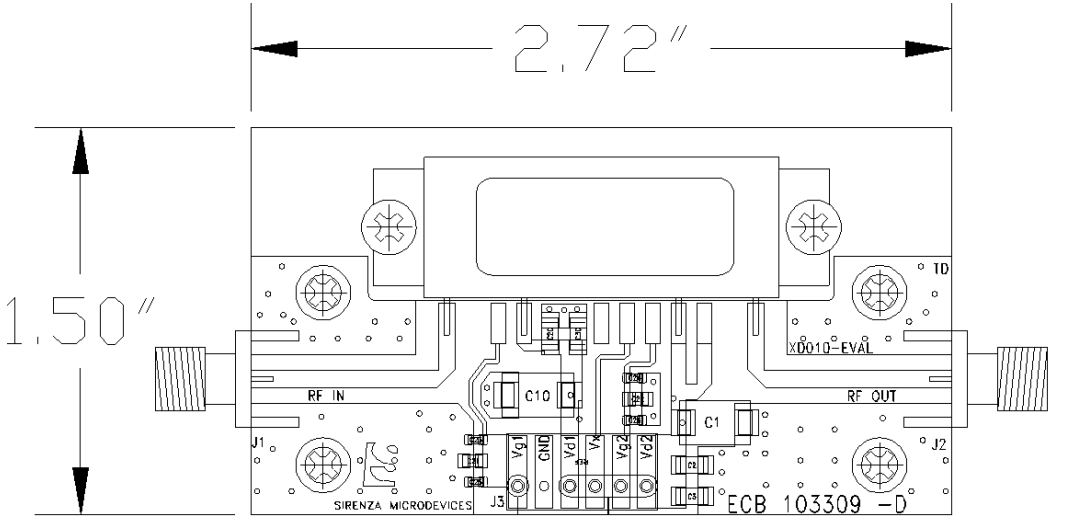
Pin	Function	Description
1	RFIN	Module RF input. This pin is internally connected to DC ground. Do not apply DC voltages to the RF leads. Care must be taken to protect against video transients that may damage the active devices.
2	VD1	This is the drain voltage for the first stage. Nominally +28Vdc
3	VD2	This is the drain voltage for the 2nd stage of the amplifier module. The 2nd stage gate bias is temperature compensated to maintain constant quiscent drain current over the operating temperature range. See Note 1.
4	RFOUT	Module RF output. This pin is internally connected to DC ground. Do not apply DC voltages to the RF leads. Care must be taken to protect against video transients that may damage the active devices.
Flange	GND	Exposed area on the bottom side of the package needs to be mechanically attached to the ground plane of the board for optimum thermal and RF performance. See mounting instructions in application note AN-060 on RFMD's web site.

Note 1: The internally generated gate voltage is thermally compensated to maintain constant quiescent current over the temperature range listed in the data sheet. No compensation is provided for gain changes with temperature. This can only be accomplished with AGC external to the module.

Note 2: Internal RF decoupling is included on all bias leads. No additional bypass elements are required, however some applications may require energy storage on the drain leads to accommodate time-varying waveforms.

Note 3: This module was designed to have its leads hand soldered to an adjacent PCB. The maximum soldering iron tip temperature should not exceed 700° F, and the soldering iron tip should not be in direct contact with the lead for longer than 10 seconds. Refer to app note AN060 (www.RFMD.com) for further installation instructions.

Test Board Layout



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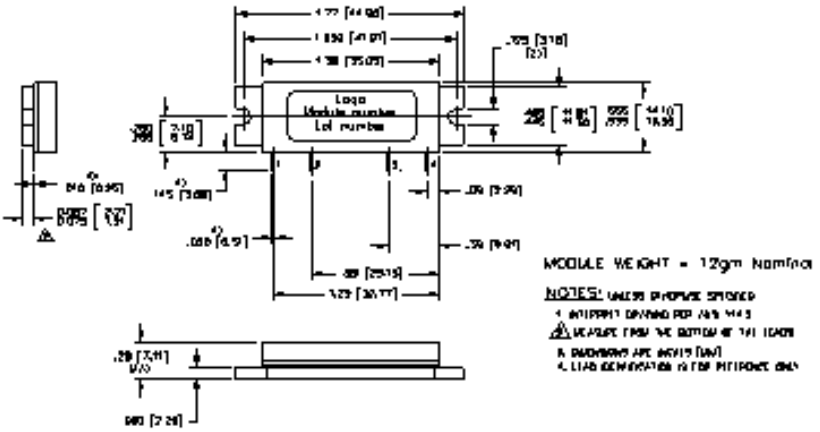
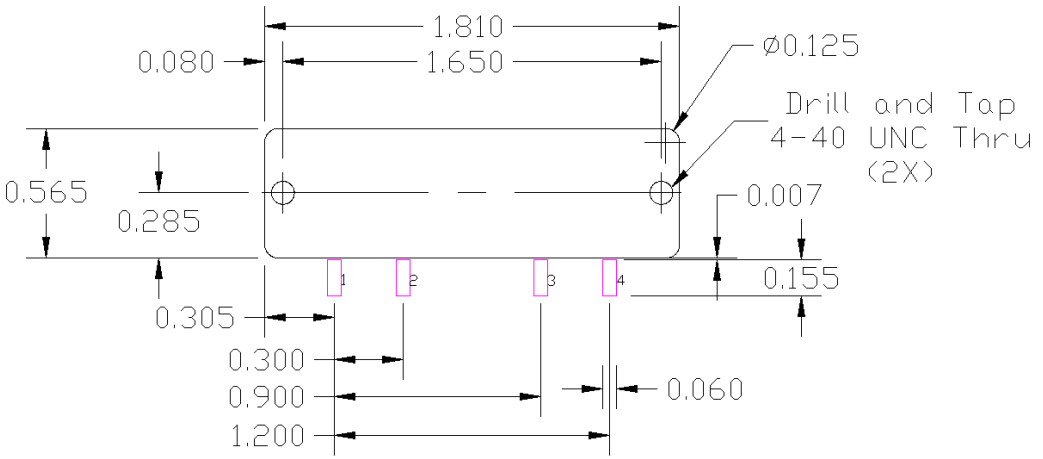
Package Outline Drawing

Dimensions in inches (millimeters)
Refer to drawing posted at www.rfmd.com for tolerances.



Recommended PCB Cutout and Landing Pads for the D4F Package

Dimensions in inches (millimeters)



Refer to Application note AN-060 “Installation Instructions for XD Module Series” for additional mounting information. App note available at www.RFMD.com.

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