

DC-12GHZ ATTENUATOR

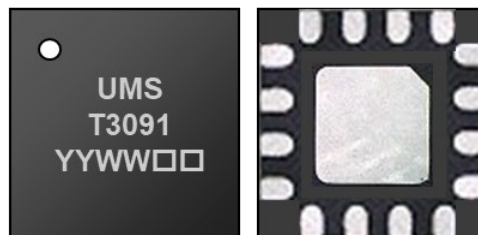
GaAs Monolithic Microwave IC in SMD leadless package

Description

The CHT3091aQAG is a variable DC-12GHz attenuator designed for a wide range of applications, from military to commercial communication systems.

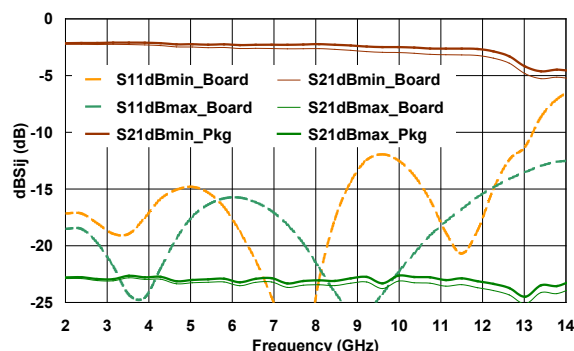
It is supplied in lead-free SMD package. The circuit is manufactured with a MESFET process, 0.7 μ m gate length, via holes through the substrate, air bridges and electron beam gate lithography.

It is supplied in RoHS compliant SMD package.



Main Features

- Broadband performances: DC-12GHz
- 15dBm typical input @1dB compression point (any attenuation, 1-12GHz)
- DC bias: -5V<V_S<0V ; -5V<V_P<0V
- Package type: 16 Leads QFN3x3
- MSL1



Board Measured performances* @ 20°C

*Evaluation Board is described in page3

Main Electrical Characteristics

T_{amb.} = +25°C

Symbol	Parameter	Min	Typ	Max	Unit
F _{in}	Input frequency range	DC		12	GHz
Min Att.	Minimum attenuation S21 (V _S =0V; V _P =-5V)		3	4	dB
Max Att.	Maximum attenuation S21 (V _S =-5V; V _P =0V)	20	23		dB
P _{in} 1dB	Input 1dB comp. point (any Att., F _{in} > 1GHz)	14			dBm

ESD Protection: Electrostatic discharge sensitive device. Observe handling precautions!

Main Characteristics

$T_{amb.} = 25^{\circ}\text{C}$

Symbol	Parameter	Min	Typ	Max	Unit
F_{in}	Input frequency range	DC		12	GHz
Min Att.	Minimum attenuation $ S_{21} $ ($V_S=0\text{V}; V_P=-5\text{V}$)		3.0	4.0	dB
Max Att.	Maximum attenuation $ S_{21} $ ($V_S=-5\text{V}; V_P=0\text{V}$)	20	23		dB
$VSWR_{in}$	Input VSWR (any attenuation)		2.:1		
$VSWR_{out}$	Output VSWR (any attenuation)		2.:1		
P_{in1dB}	Input 1dB compression point.(any attenuation, 1 – 12GHz)	14	15		dBm

These values are representative of onboard measurements as defined in the application section.

ESD Protection: Electrostatic discharge sensitive device. Observe handling precautions!

Absolute Maximum Ratings

$T_{amb.} = 25^{\circ}\text{C}$ ⁽¹⁾

Symbol	Parameter	Values	Unit
V_P	V_P control voltage	-6V to +0.6V	V
V_S	V_S control voltage	-6V to +0.6V	V
P_{in}	RF input power	20	dBm
T_a	Operating temperature range	-40 to +85	$^{\circ}\text{C}$
T_{stg}	Storage temperature range	-55 to +150	$^{\circ}\text{C}$

⁽¹⁾ Operation of this device above anyone of these parameters may cause permanent damage.

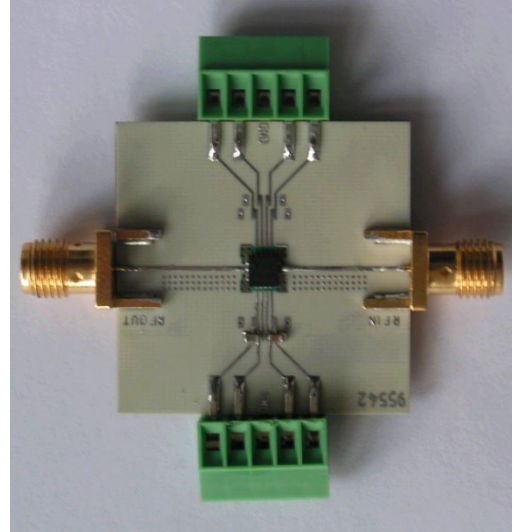
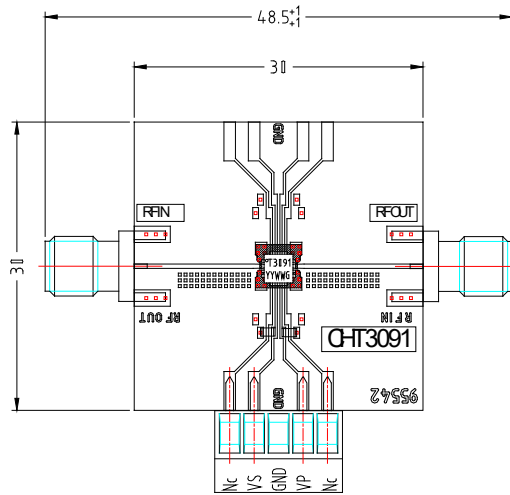
Typical Bias Conditions

For an ambient Temperature of +25 $^{\circ}\text{C}$

Symbol	Pin No.	Parameter	Values	Unit
V_S	6	V_S control voltage	-5 to 0	V
V_P	7	V_P control voltage	0 to -5	V

All other pins are not used for this device (but RF_{in} : pin 2 and RF_{out} : pin 11).

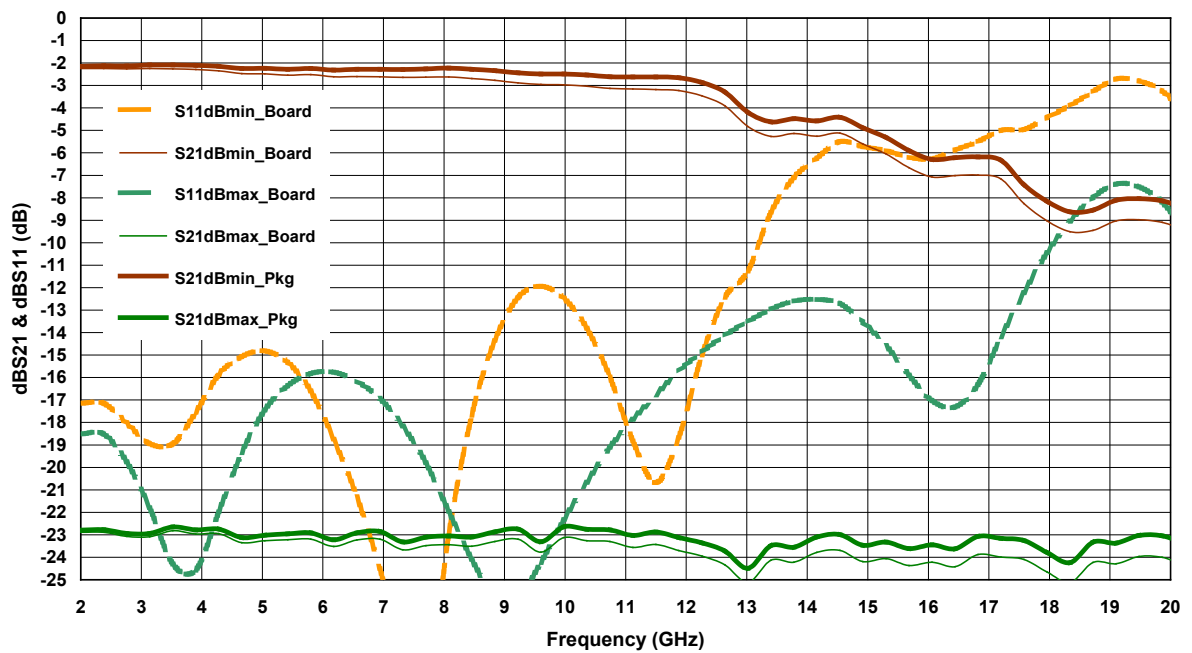
Evaluation Board



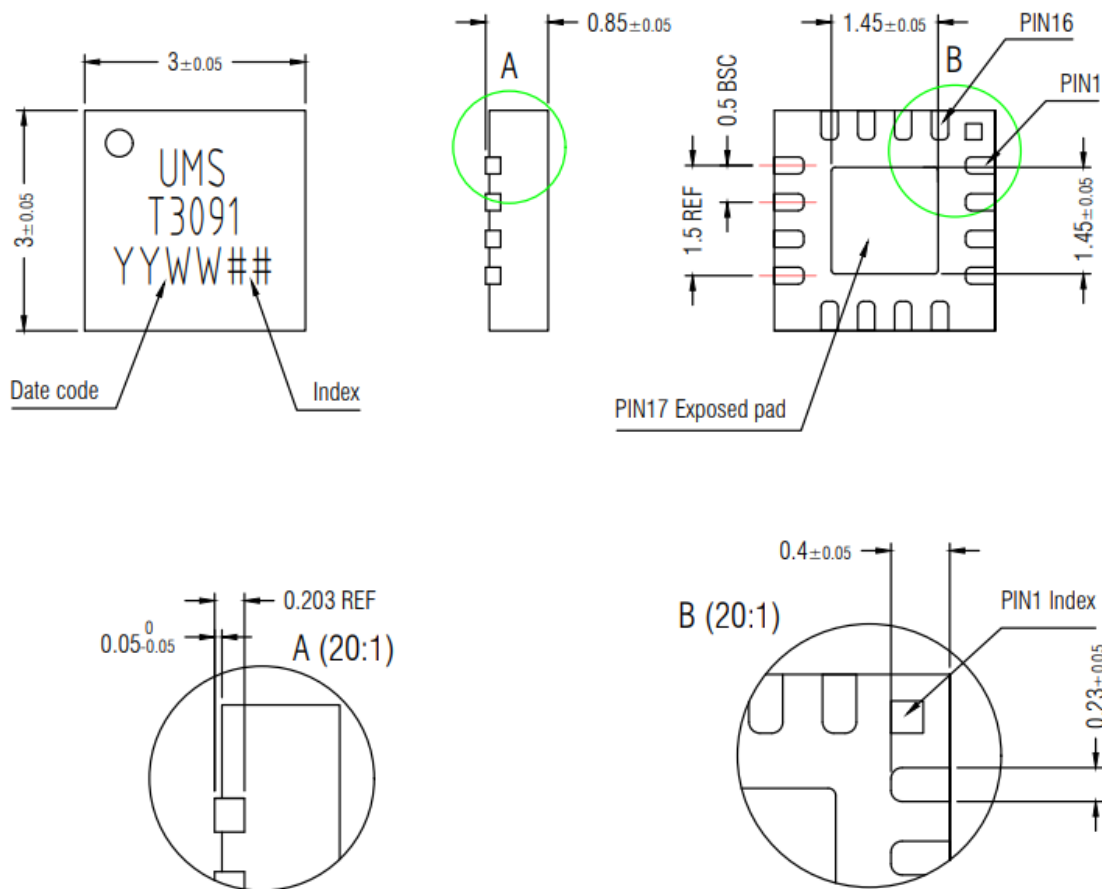
Typical Results

 $T_{\text{amb}} = +25^{\circ}\text{C}$
 $V_P = 0\text{V to } -5\text{V} \text{ \& } V_S = -5\text{V to } 0\text{V}$

PCB Measured Performance
($T_{\text{amb. } 25^{\circ}\text{C}}$)



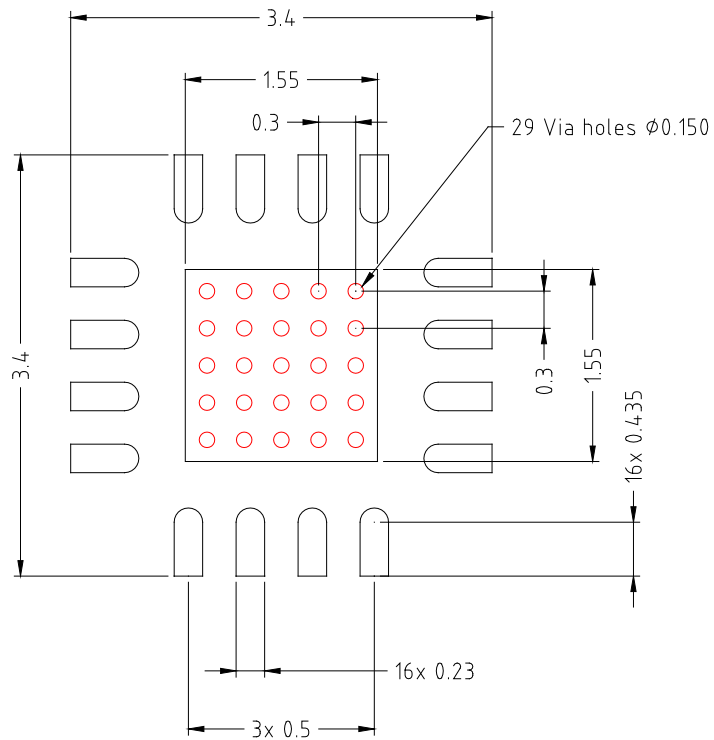
Package outline ⁽¹⁾



Matte tin, Lead Free (Green)	1- GND ⁽²⁾	7- V _P	13- Nc
Units : mm	2- RF in	8- Nc	14- Nc
From the standard : JEDEC MO-220	3- GND ⁽²⁾	9- Nc	15- Nc
(VEED)	4- Nc	10- GND ⁽²⁾	16- Nc
17 (exposed pad)- GND ⁽²⁾	5- Nc	11- RF out	
	6- V _S	12- GND ⁽²⁾	

⁽¹⁾ Refer to the application note AN0017 (<https://www.ums-rf.com>) for general consideration and recommendations for Molded Plastic QFN/DFN packages.

⁽²⁾ It is strongly recommended to ground all pins marked "GND" through the PCB board. Ensure that the PCB board is designed to provide the best possible ground to the package.

Recommended footprint for 16L-QFN3x3

*This land pattern is used for UMS prototyping assembly.
For production, design must be adapted with regard to
PCB tolerances and assembly process.*

Note: The RF ports are not DC blocked. There are no DC capacitors in the package.

Package Information

Parameter	Value
Package body material	RoHS-compliant
	Low stress Injection Molded Plastic
Lead finish	100% matte tin (Sn)
MSL Rating	MSL1

SMD mounting procedure

For the mounting process standard techniques involving solder paste and a suitable reflow process can be used. For further details, see application note AN0017.

Recommended environmental management

UMS products are compliant with the regulation in particular with the directives RoHS N°2011/65 and REACH N°1907/2006. More environmental data are available in the application note AN0019 also available at <https://www.ums-rf.com>.

Recommended ESD management

Refer to the application note AN0020 available at <https://www.ums-rf.com> for ESD sensitivity and handling recommendations for the UMS package products.

Ordering Information

QFN 3x3 package:

CHT3091aQAG/XY

Stick: XY = 20

Tape & reel: XY = 21

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