TGA2536-FL

5.5 Watt Ku-Band Power Amplifier

Applications

- Ku-band communications
- Ku-band VSAT
- Point-to-Point Radio



Product Features

- Frequency Range: 13.5 – 16 GHz
- Saturated Output Power: 37.4 dBm
- Small Signal Gain: 25 dB
- Bias: Vd = 8 V, Idq = 2.6 A, Vg = -0.6 V typical
- Pulsed operation

General Description

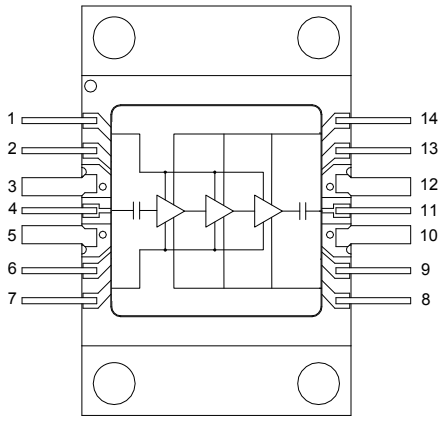
The TriQuint TGA2536-FL provides 25 dB of small signal gain and 5.5 W of output power across 13.5-16 GHz. The TGA2536-FL is designed using TriQuint's proven standard 0.25µm gate pHEMT production process.

The TGA2536-FL features low loss ground-signal-ground (GSG) RF transitions designed to interface with a coplanar waveguide multilayer board.

This device is ideally suited for Ku-band communications including military, VSAT transmitter and Point to Point Radio applications. The flange lead package has a high thermal conductivity copper alloy base.

Lead-free and RoHS compliant.

Functional Block Diagram



Pin Configuration

Pin #	Symbol
1,7	Vg
2,6,9,13	N/C
3,5,10,12	Gnd
4	RF In
8,14	Vd
11	RF Out

Ordering Information

Part No.	ECCN	Description
TGA2536-FL	3A001.b.2.c	Ku-band Power Amplifier

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Specifications

Absolute Maximum Ratings

Parameter	Rating
Drain Voltage,Vd	9 V
Gate Voltage,Vg	-5 to 0 V
Drain Current, Id	4.4 A
Gate Current range, Ig	-18 to 18 mA
RF Input Power, CW, 50Ω,T = 25ºC	21 dBm
Channel Temperature, Tch	200°C
Mounting Temperature (30 Seconds)	260 °C
Storage Temperature	-40 to 150 °C

Operation of this device outside the parameter ranges given above may cause permanent damage. These are stress ratings only, and functional operation of the device at these conditions is not implied.

Recommended Operating Conditions

Parameter	Min	Typ	Max	Units
Vd		8		V
Idq (no RF drive)		2.6		A
Id_drive (under RF drive)		3.3		A
Vg		-0.6		V

Electrical specifications are measured at specified test conditions. Specifications are not guaranteed over all recommended operating conditions

Electrical Specifications

Test conditions unless otherwise noted: 25ºC, Vd = 8 V, 20% duty cycle, Idq = 2.6 A, Vg = -0.6 V typical

Parameter	Min	Typ	Max	Units
Operational Frequency Range	13.5		16	GHz
Small Signal Gain		25		dB
Output Power @ Saturation		37.4		dBm
Power-added Efficiency @ Saturation		20		%
Power Temperature Coefficient		-0.004		dB/°C

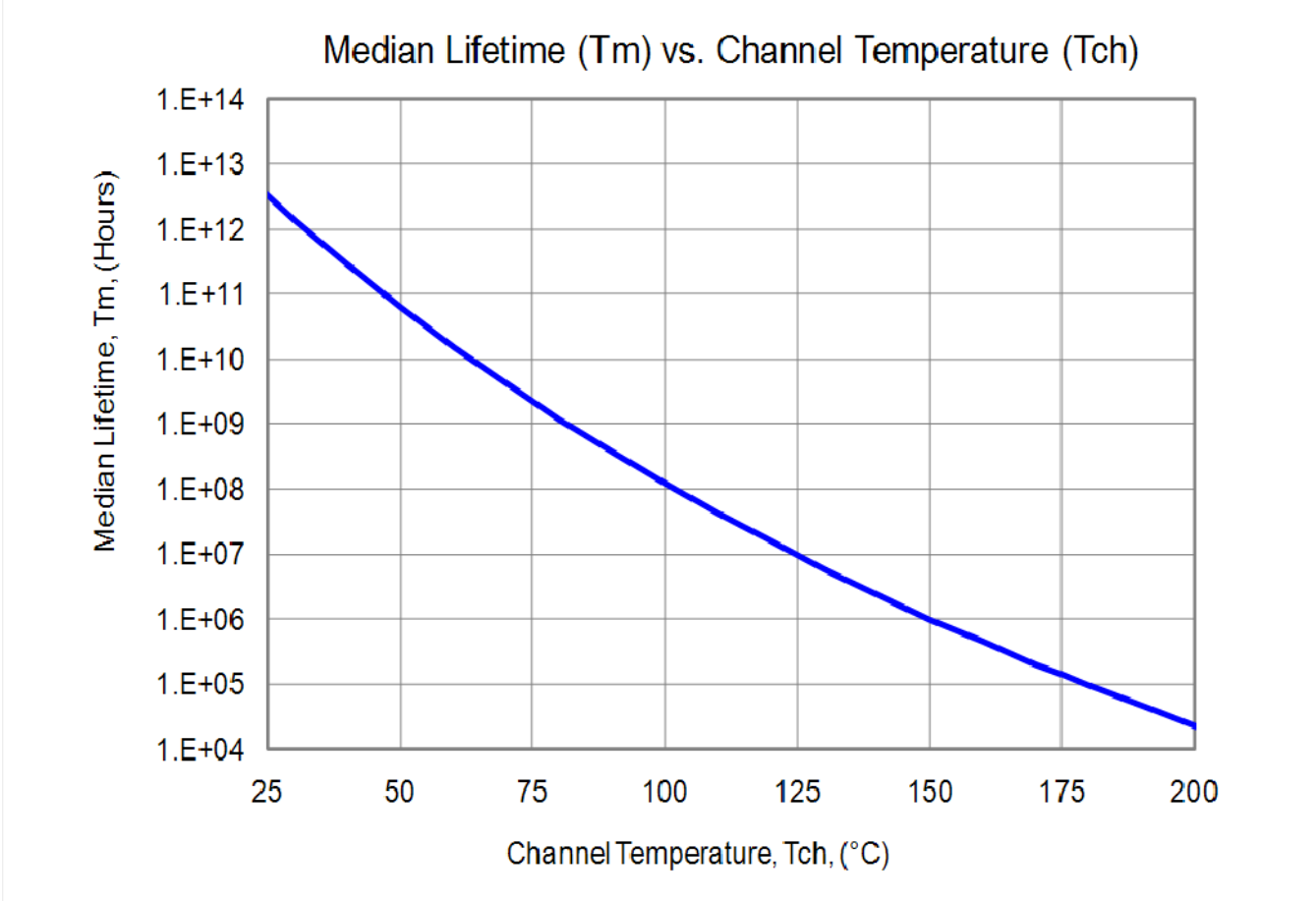
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Specifications (cont'd)

Thermal and Reliability Information

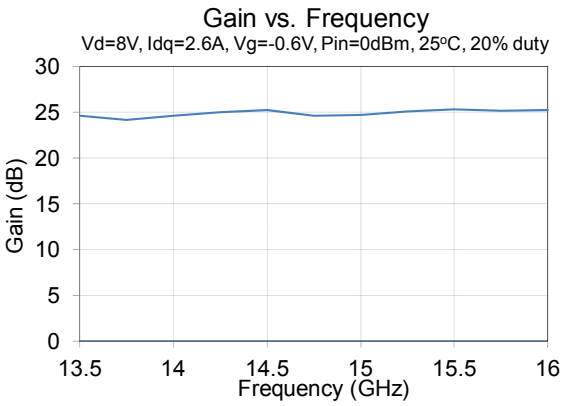
Parameter	Condition	Rating
Channel Temperature (Tch), Median Lifetime (Tm), Thermal Resistance*, no RF drive	Tbase = 85 °C, Vd = 8V, Idq = 2.6 A, Pdiss = 20.8 W, pulsed 20% duty cycle	Tch = 149 °C Tm = 1.0E+6 Hours θJC = 3.1 °C/W
Channel Temperature (Tch), Median Lifetime (Tm), Thermal Resistance*, under RF Drive	Tbase = 85 °C, Vd = 8V, Id = 3.5 A, Pout = 37.0 dBm, Pdiss = 23.0 W, pulsed 20% duty cycle	Tch = 152 °C Tm = 1.0E+6 Hours θJC = 2.9 °C/W
Channel Temperature (Tch), Median Lifetime (Tm), Thermal Resistance*, under RF Drive	Tbase = 85 °C, Vd = 8V, Id = 3.1 A, Pout = 36.0 dBm, Pdiss = 20.8 W, CW	Tch = 173 °C Tm = 1.6E+5 Hours θJC = 4.2 °C/W

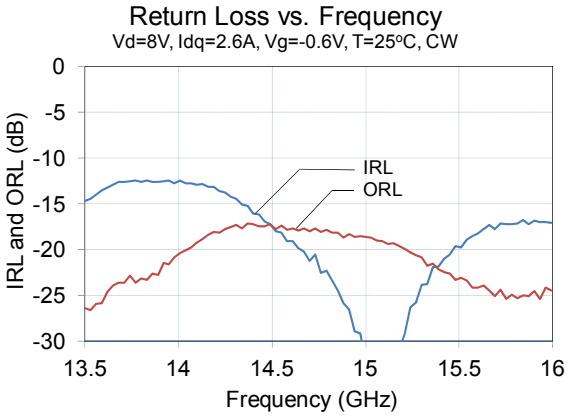
* Thermal Resistance, θJC, measured to center back of package

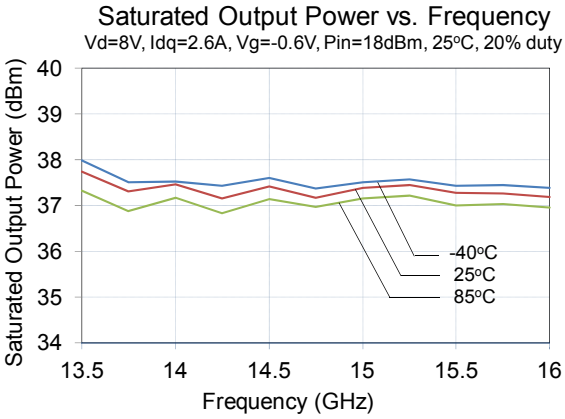


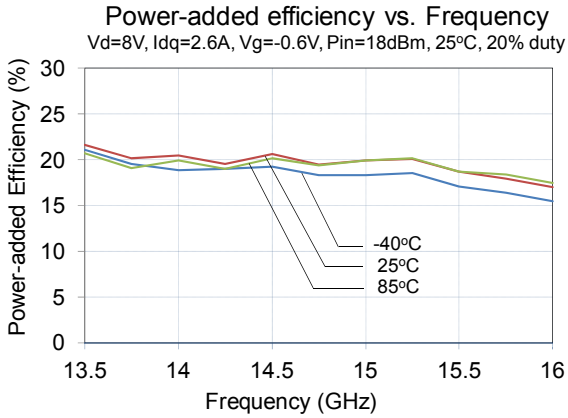
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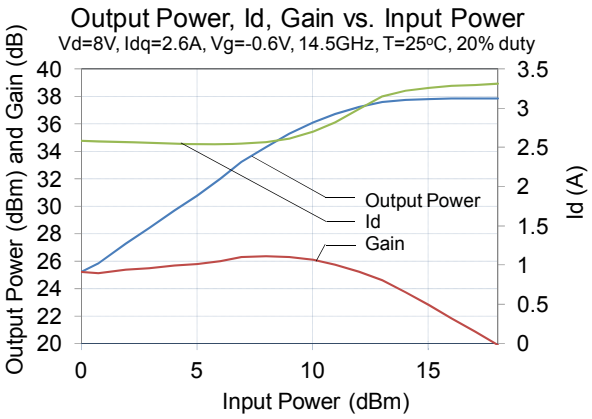
Typical Performance





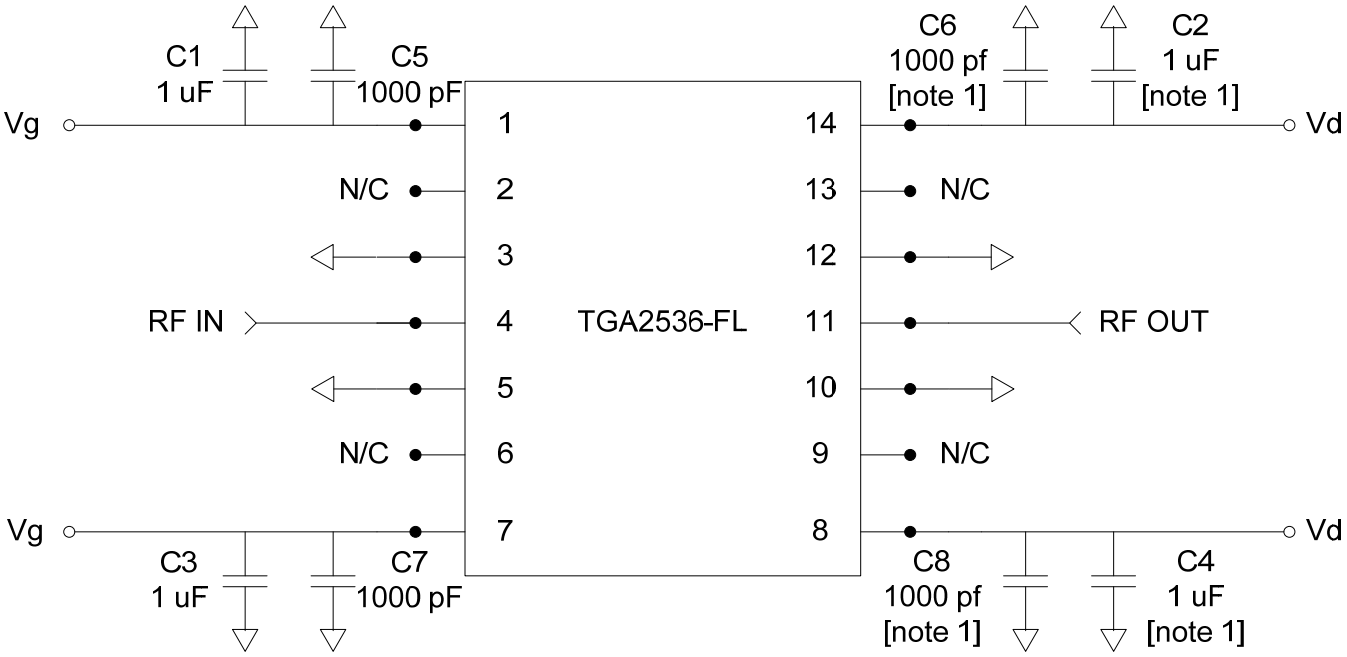






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Application Circuit

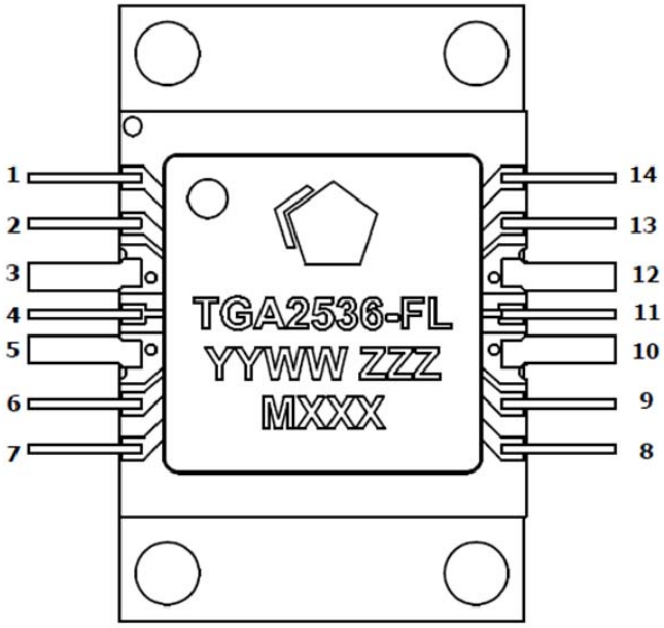


Note 1: Remove cap for pulsed drain operation

Bias-up Procedure	Bias-down Procedure
Turn Vg to –2 V	Turn off RF signal
Turn Vd to 8 V	Reduce Vg to –2 V. Ensure Id ~ 0 mA
Adjust Vg more positive until quiescent Id is 2.6 A. This will be Vg ~ -0.6 V typical	Turn Vd to 0 V
Apply RF signal	Turn Vg to 0 V

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Pin Description

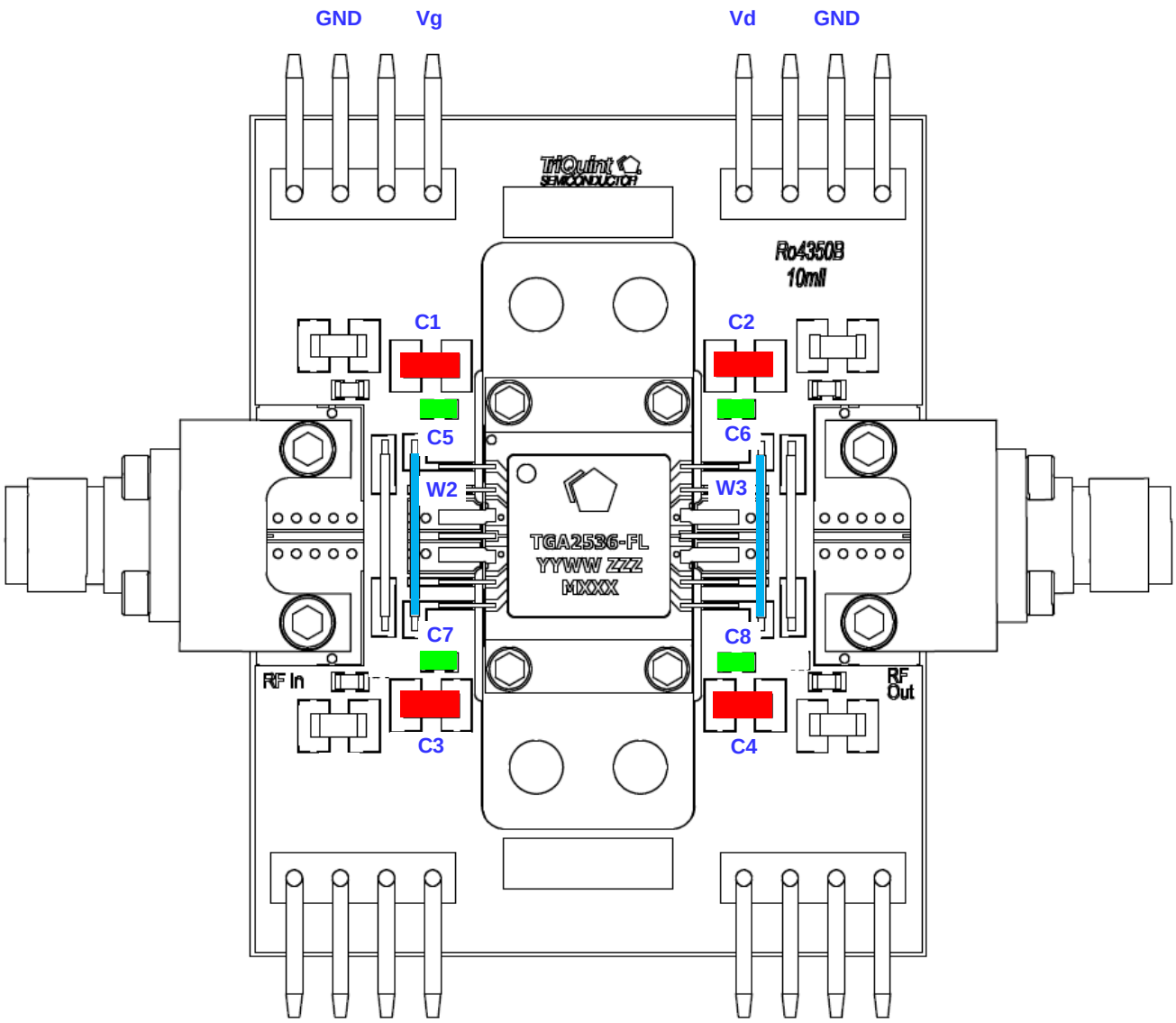


Pin #	Symbol	Description
1,7	Vg	Gate voltage. Bias network is required; top and bottom sides must be connected and biased
2,6,9,13	N/C	Internally grounded; may be left open
3,5,10,12	Gnd	Connect to Ground
4	RF In	Input, matched to 50 ohms
8,14	Vd	Drain voltage. Bias network is required; all Drain voltage pins must be connected and biased
11	RF Out	Output, matched to 50 ohms

Note: See Application Circuit on page 5 as an example

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Evaluation Board Layout

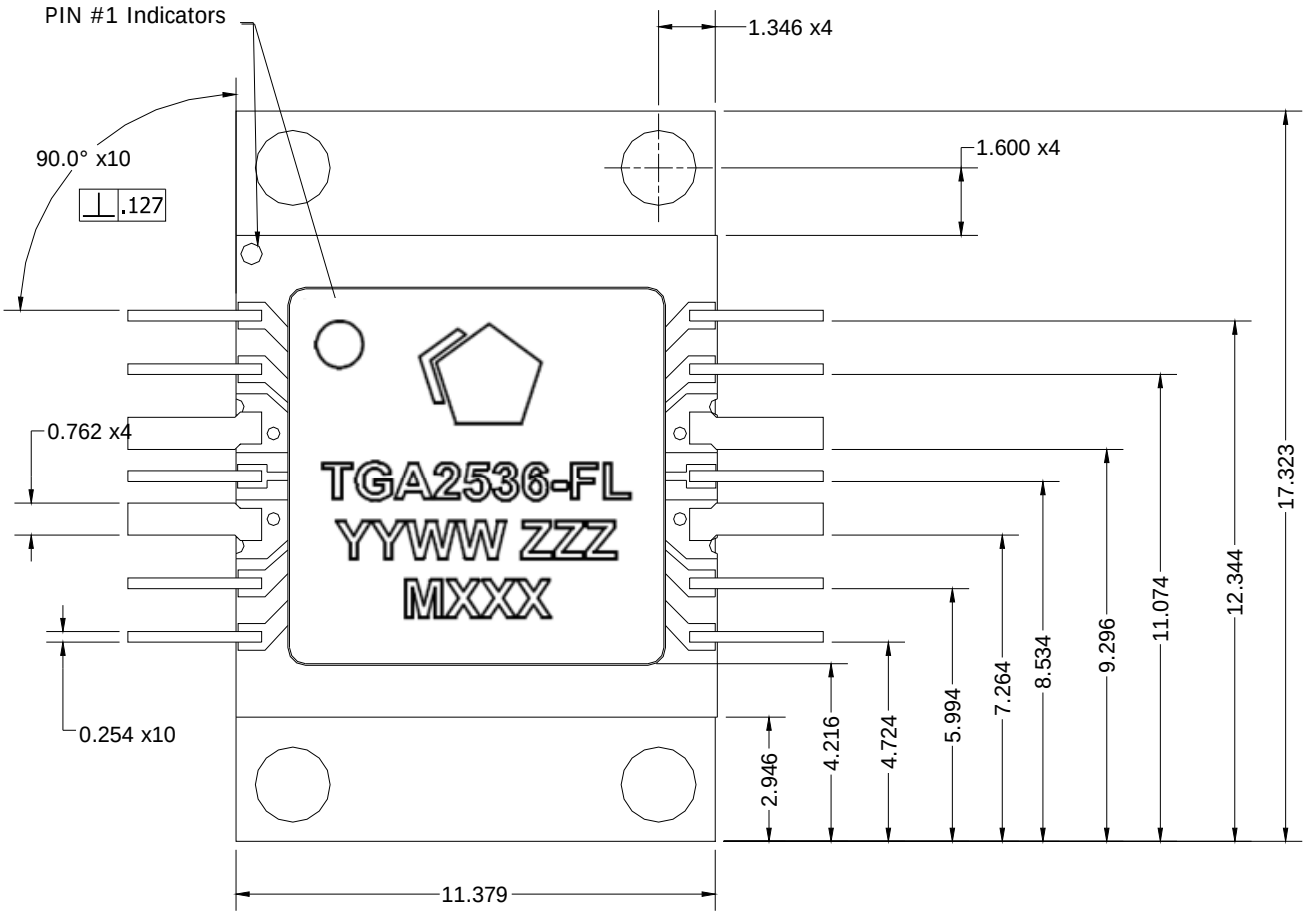


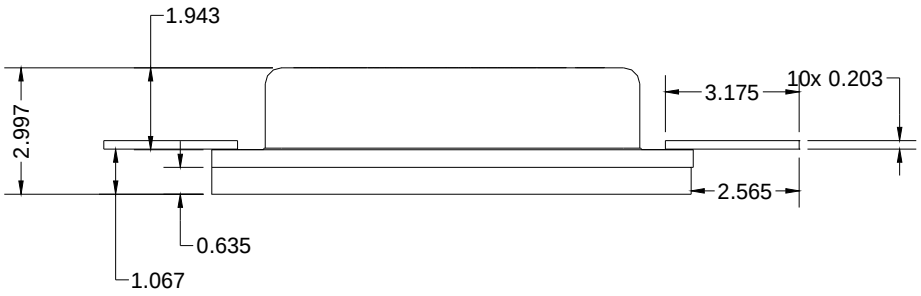
Bill of Material

Ref Des	Value	Description	Manufacturer	Part Number
C1-C4	1 uF	Cap, 1206, 50V, 10%, X7R	Panasonic	ECJ-3YX1H105K
C5-C8	1000 pF	Cap, 0603, 50V, 10%, X7R	Panasonic	ECJ-ZEB1H102K
W2,W3		Jumper, 20 gauge wire	Various	

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Mechanical Information





Unit: millimeters
Part marking:

YY	assembly lot start year
WW	assembly lot start week
ZZZ	part serial number
MXXX	batch ID

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Product Compliance Information

ESD Information



Caution! ESD-Sensitive Device

ESD rating:	TBD
Value:	Passes ≥ TBD V min.
Test:	Human Body Model (HBM)
Standard:	JEDEC Standard JESD22-A114

Solderability

This part is compliant with EU 2002/95/EC RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

This product also has the following attributes:

- Lead Free
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A ($C_{15}H_{12}Br_40_2$) Free
- PFOS Free

ECCN

US Department of Commerce: 3A001.b.2.c

Assembly Notes

1. Clean the board or module with alcohol. Allow it to fully dry
2. Nylock screws are recommended for mounting the TGA2536-FL to the board
3. To improve the thermal and RF performance, we recommend a heat sink attached to the bottom of the board and/or apply thermal compound to the bottom of the TGA2536-FL
4. Apply solder to each pin of the TGA2536-FL.
5. Clean the assembly with alcohol.

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Contact Information

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