

General Description

The ASRS179R6 is a GaAs MMIC SPDT switch in a SOT-363 6 lead plastic package. The ASRS179R6 features low insertion loss and positive voltage operation with low DC power consumption. Typical applications are for the variety of analog and digital wireless communication systems.

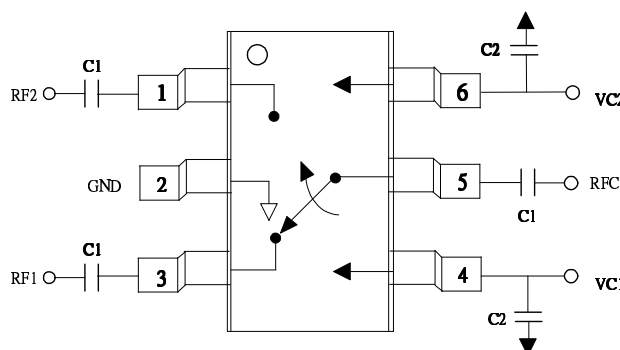
Features

- Insertion Loss: 0.4dB @ 2.5GHz
- P_{-1dB}: +30dBm Typical @ +3V
- IIP3: 55dBm @ Input Power up to 20dBm
- Good Reliability Performance
- SOT-363 6 Lead Plastic Package
- T/R Switches in 802.11b, g WLAN Systems

Application

- WLAN
- Mobile Phone
- Bluetooth
- DECT
- PHS
- GPS

Function Block Diagram



C1=56pF, C2=1000pF for operation >500MHz
DC blocking capacitors C1 are required on all RF ports.

Absolute Maximum Ratings

Parameter	Value	Unit
Switch Control VC1, VC2	-6.0 to +6.0 Note	V
RF input Power (>500MHz)	33	dBm
Operating Temperature	-40 to +85	°C
Storage Temperature	-65 to +150	°C

Note | VC1-VC2 | ≤ 6.0V

Notes:

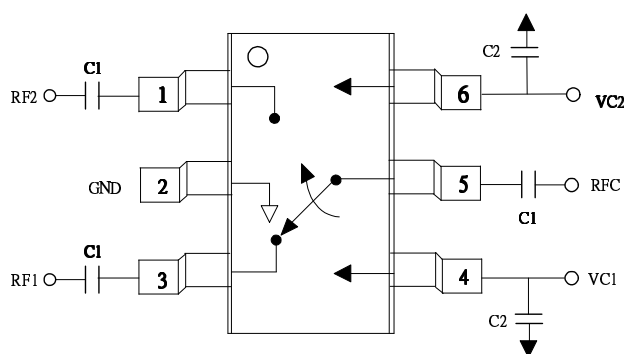
1. Operation of this device in excess of any maximum rating as specified above may cause permanent damage to the device.
2. Caution ! ESD Sensitive Device.

Electrical Specifications at 25 C with 0, +3V Control Voltages

Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Insertion Loss	Input Power +25dBm DC–1.0GHz	-	0.3	0.4	dB
	1.0 -2.0GHz	-	0.4	0.5	dB
	2.0 -3.0GHz	-	0.4	0.6	dB
Isolation	Input Power +25dBm DC–1.0GHz	24	26	-	dB
	1.0 -2.0GHz	22	24	-	dB
	2.0 -3.0GHz	21	23	-	dB
VSWR	DC–1.0GHz	-	1.2	1.4	-
	1.0 -2.0GHz	-	1.2	1.4	-
	2.0 -3.0GHz	-	1.5	1.6	-
Input Power for 1 dB compression	2.5GHz	-	30	-	dBm
Second Harmonics	f=2.5GHz, P _{in} =25dBm	-	-75	-	dBc
Third Harmonics	f=2.5GHz, P _{in} =25dBm	-	-80	-	dBc
Intermodulation Intercept Point (IIP3)	For two tones (f=2.5GHz, 2.501GHz) @ Input power +20dBm	-	55	-	dBm
Switch Time		-	50	-	ns
Control Current	Input Power +25dBm	-	4	100	μA

Notes: All measurements made in 50Ω system, unless otherwise specified.
DC=500MHz

Pin Connections and Internal Block



C1=56pF , C2=1000pF for operation >500MHz
DC blocking capacitors C1 are required on all RF ports.

Pin Assignment

Pin No.	Pin Name
1	RF2
2	GND
3	RF1
4	VC1
5	RFC
6	VC2

SW Truth Table

VC1	VC2	RFC-RF1	RFC-RF2
High	Low	Isolation	Insertion Loss
Low	High	Insertion Loss	Isolation

High: 3V to 5V, Low: -0.2V to 0.2V

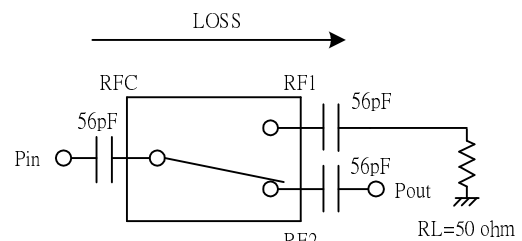
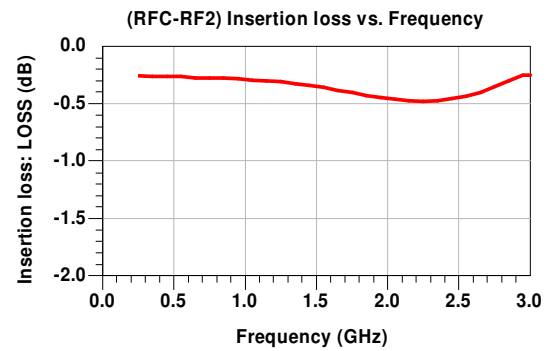
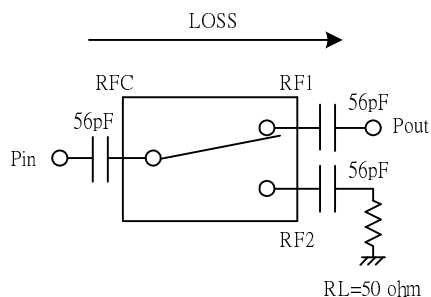
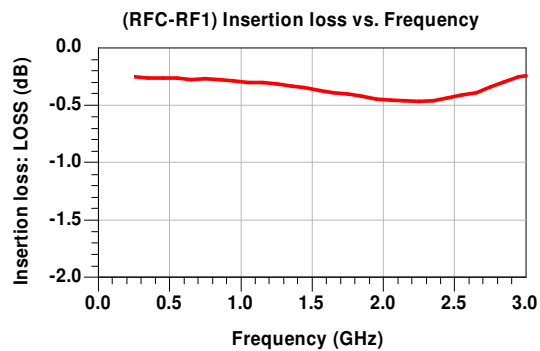
Reliability Testing Items and Specification

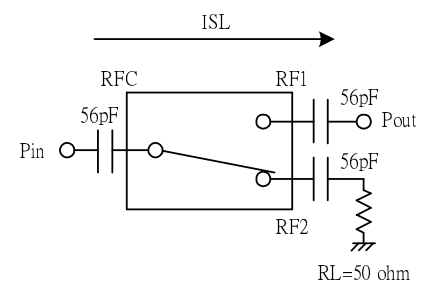
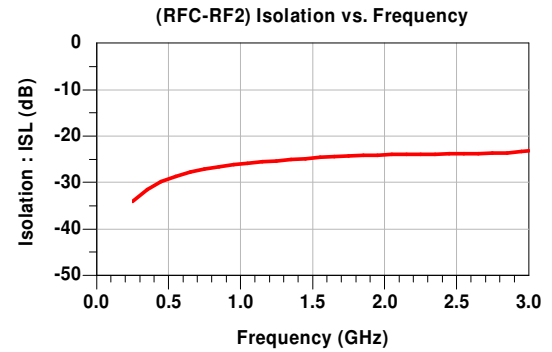
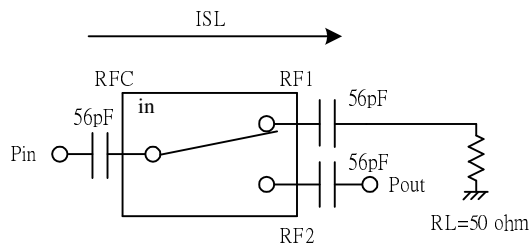
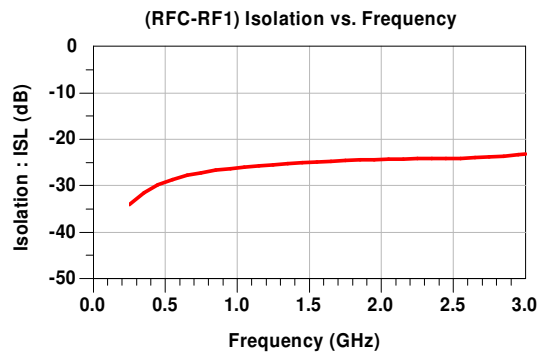
No.	Testing Items
1	Temperature Cycling Testing + IR Reflow
2	Pressure Cooker Testing + IR Reflow
3	Thermal Humidity Testing
4	Working Life
5	Electro-Static Discharge
6	Over Voltage
7	Over Power

All sample passed reliability testing

Typical Characteristics

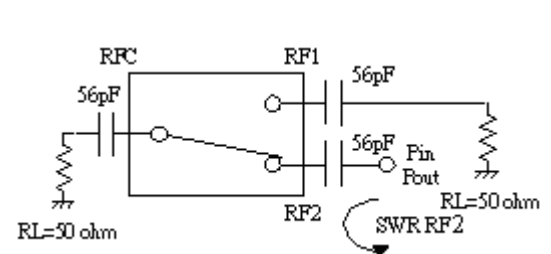
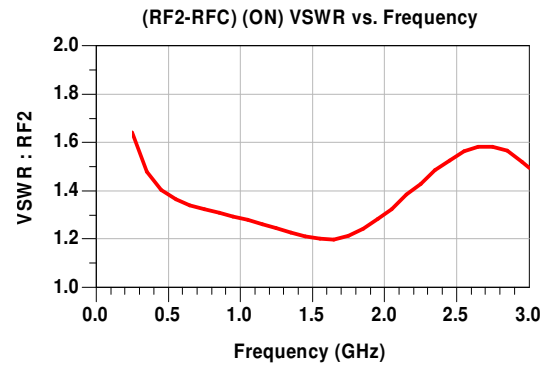
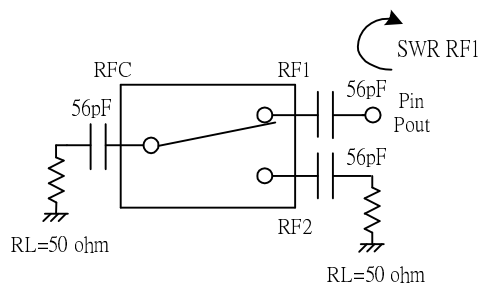
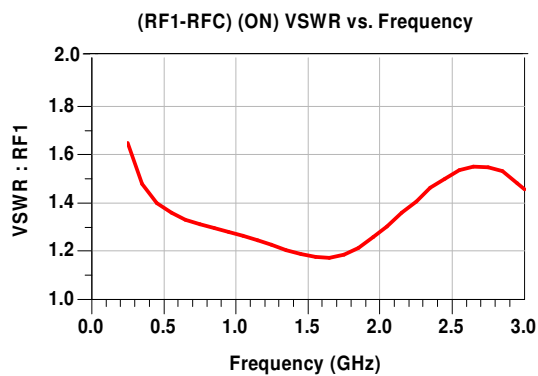
($V_{cc}=0V/3.0V$, $P_{in}=0dBm$)

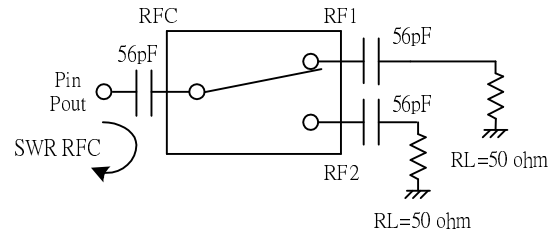
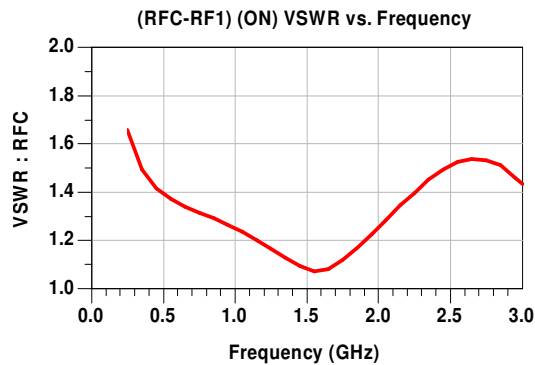




Typical Characteristics (continued)

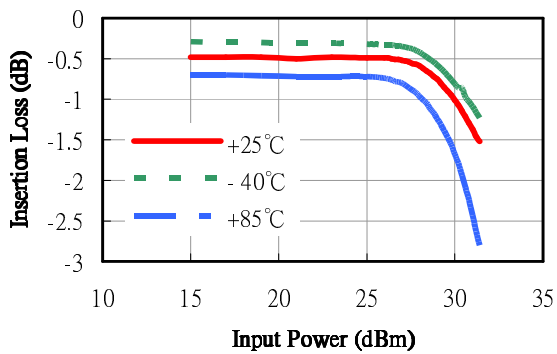
($V_{cc}=0V/3.0V$, $P=0dBm$)



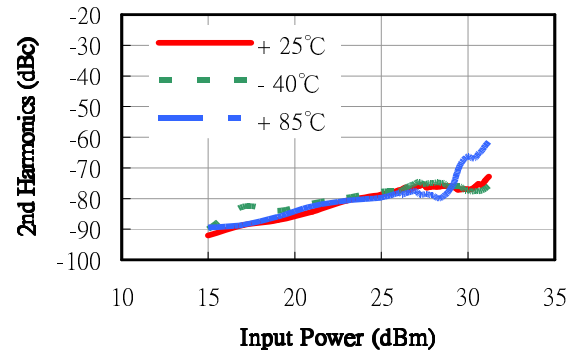


Typical Characteristics (continued)

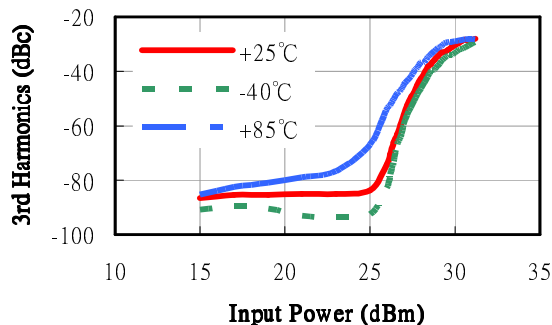
Insertion Loss vs. Input Power
($V_{cc}=0V/3.0V$, $2.5GHz@-40^{\circ}C, +25^{\circ}C, +80^{\circ}C$)



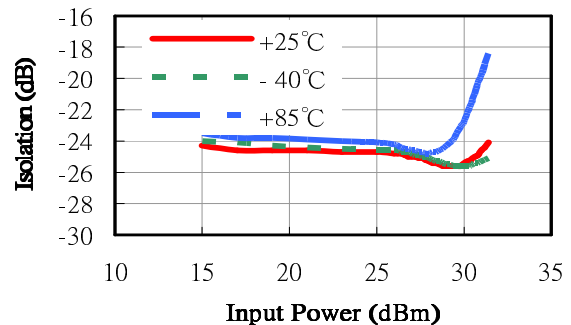
2nd Harmonics vs. Ambient Temperature
($V_{cc}=0V/3.0V$, $2.5GHz@-40^{\circ}C, +25^{\circ}C, +80^{\circ}C$)



3rd Harmonics vs. Ambient Temperature
($V_{cc}=0V/3.0V$, $2.5GHz@-40^{\circ}C, +25^{\circ}C, +80^{\circ}C$)



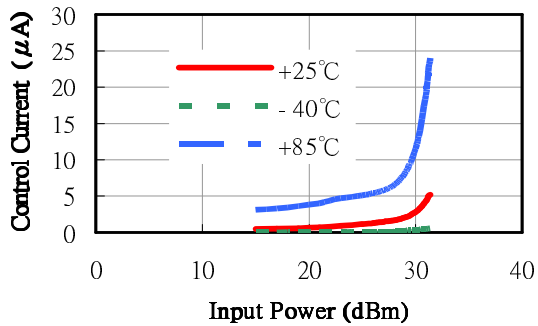
Isolation vs. Input Power
($V_{cc}=0V/3.0V$, $2.5GHz@-40^{\circ}C, +25^{\circ}C, +80^{\circ}C$)



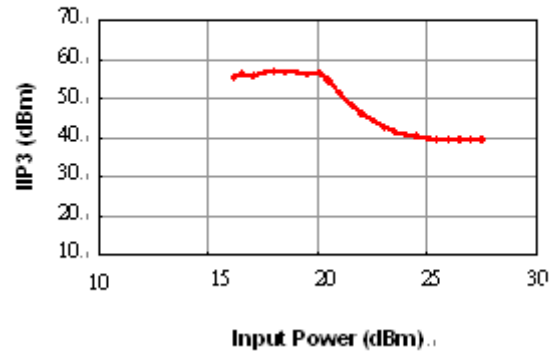
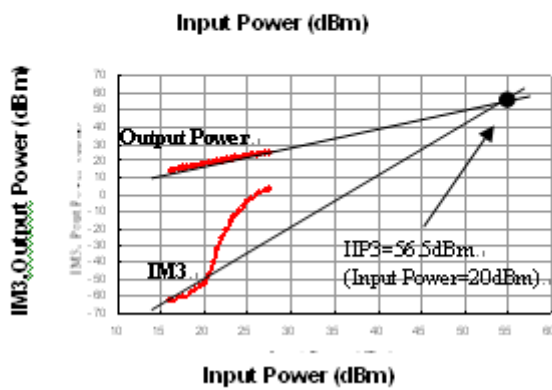
Typical Characteristics (continued)

Control Current vs. Input Power

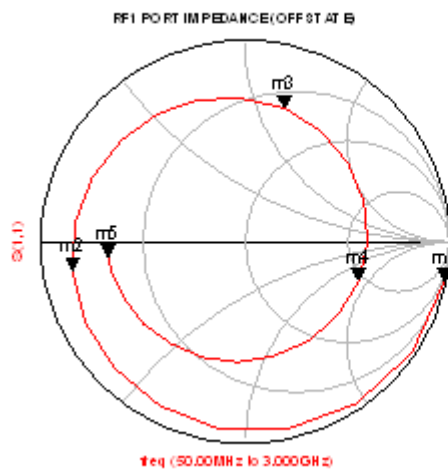
($V_{cc}=0V/3.0V$, 2.5GHz@-40°C,+25°C,+80°C)


IIP3 vs. Input Power

($V_{cc}=0V/3.0V$, 2.5 GHz)


Output Power, IM3 vs. Input Power
 ($V_{cc}=0V/3.0V$, 2.5 GHz@ Input Power 20dBm)


RF1 Port Impedance (Off State)



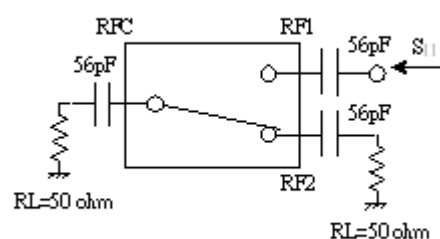
m1
freq=50.00MHz
S(1,1)=0.993 / -11.534
impedance = 16.343 - j494.544

m2
freq=850.0MHz
S(1,1)=0.855 / -170.156
impedance = 3.928 - j4.279

m3
freq=1.550GHz
S(1,1)=0.689 / -73.823
impedance = 24.044 + j60.682

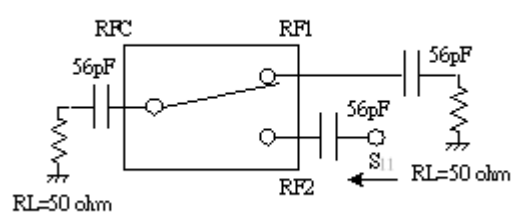
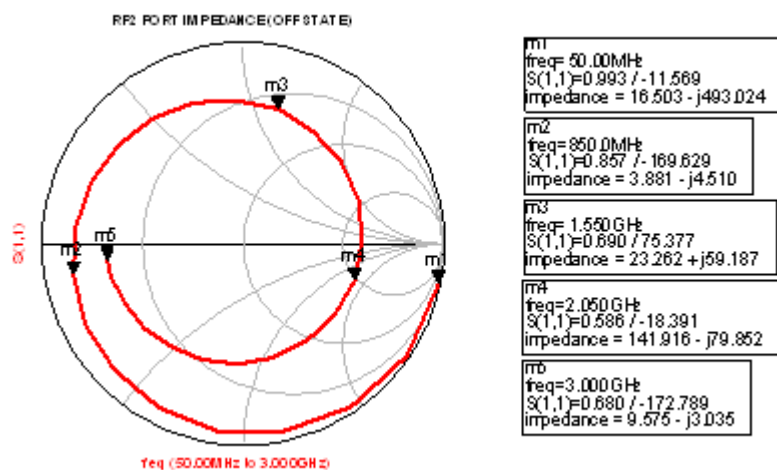
m4
freq=2.050GHz
S(1,1)=0.589 / -19.399
impedance = 138.526 - j83.073

m5
freq=3.000GHz
S(1,1)=0.675 / -173.303
impedance = 9.741 - j2.815



Marker	f (MHz)	Mag.	Ang.($^{\circ}$)
1	50	0.933	-11.53
2	850	0.855	-170.15
3	1550	0.689	73.82
4	2050	0.589	-19.39
5	3000	0.675	-173.30

RF2 Port Impedance (Off State)

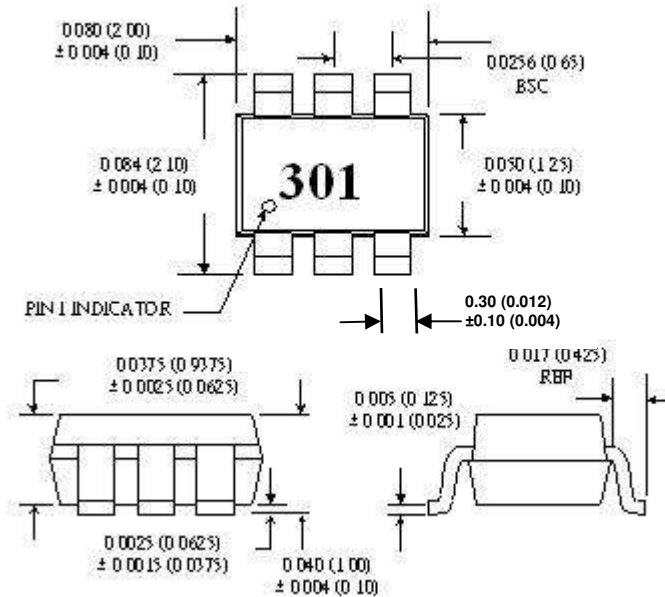


Marker	f (MHz)	Mag.	Ang.($^{\circ}$)
1	50	0.933	-11.53
2	850	0.855	-170.15
3	1550	0.689	73.82
4	2050	0.589	-19.39
5	3000	0.675	-173.30

Typical Characteristics (continued)
Scattering Parameters: S11 (Off State)
 (V_{cc}=0/3.0V, 50Ω System)

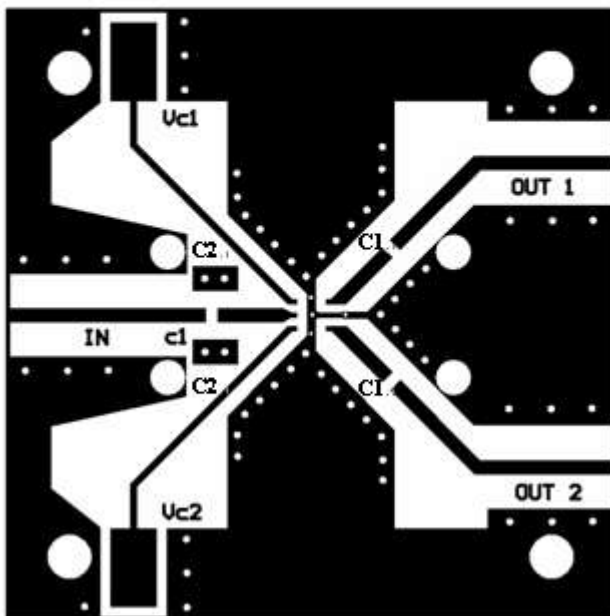
f(MHz)	RF1 Port		RF2 Port	
	Mag.	Ang.($^{\circ}$)	Mag.	Ang.($^{\circ}$)
50	0.933	-11.53	0.993	-11.56
100	0.990	-22.83	0.989	-22.91
200	0.978	-46.15	0.978	-46.27
300	0.963	-67.13	0.963	-67.27
400	0.946	-87.31	0.946	-87.42
500	0.925	-108.04	0.925	-108.06
600	0.905	-126.24	0.906	-126.13
700	0.887	-143.95	0.888	-143.69
800	0.865	-162.07	0.866	-161.62
900	0.845	-178.31	0.847	-177.68
1000	0.823	165.44	0.826	166.26
1100	0.800	148.60	0.803	149.59
1200	0.778	132.60	0.780	133.77
1300	0.751	115.52	0.753	116.87
1400	0.727	99.50	0.729	100.95
1500	0.701	82.79	0.702	84.33
1600	0.674	64.82	0.674	66.37
1700	0.652	47.04	0.650	48.57
1800	0.627	29.32	0.625	30.77
1900	0.608	9.55	0.606	10.83
2000	0.592	-9.46	0.589	-8.35
2100	0.583	-29.42	0.580	-28.56
2200	0.581	-48.34	0.578	-47.72
2300	0.583	-66.31	0.580	-65.85
2400	0.593	-84.95	0.592	-84.64
2500	0.603	-101.82	0.602	-101.59
2600	0.618	-118.17	0.619	-117.96
2700	0.633	-133.18	0.635	-133.02
2800	0.647	-147.75	0.650	-147.48
2900	0.664	-160.75	0.668	-160.39
3000	0.675	-173.30	0.680	-172.78

SOT-363 Package Dimensions (Unit: inch (mm))



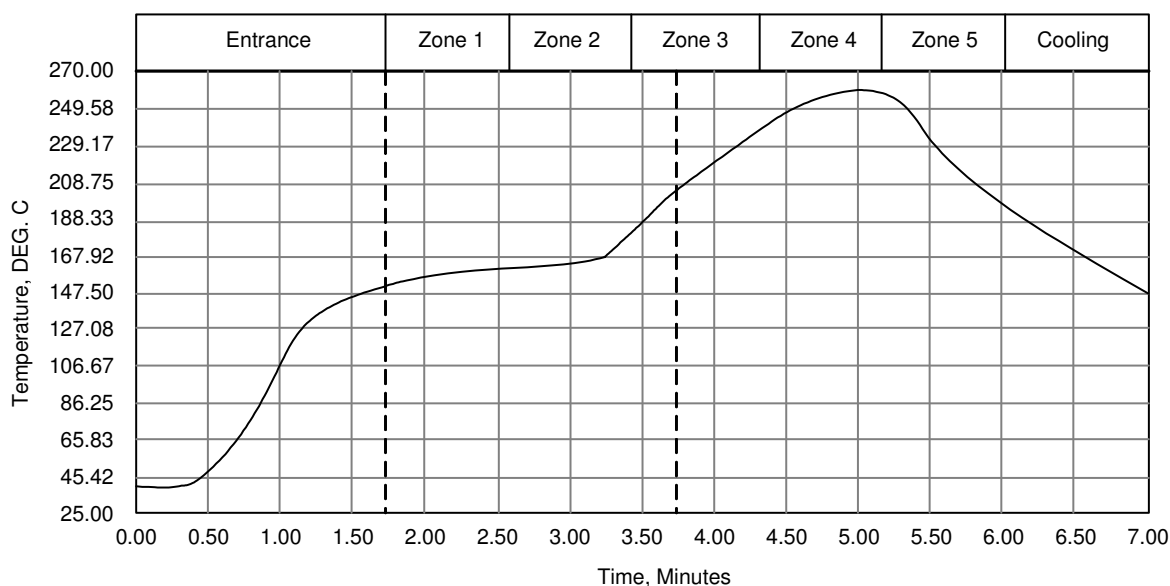
Recommended PCB Design

(TOP VIEW)



PCB SIZE : 1350mil x 1350mil
 PCB : FR-4 , Thickness=0.4mm
 Capacitor: size 0402
 Microstrip Line Width = 30mil ($Z_0=50\Omega$)
 $C1=56pF$
 $C2=1000pF$

SMT Reflow Profile



Handling Precaution

SAFETY INFORMATION ON THIS PRODUCT

Cautions on using this product

The product contains Gallium-Arsenide (GaAs). GaAs vapor and powder are hazardous to human health if inhaled or ingested.

- Do not destroy or burn the product.
- Do not cut or cleave off any part of the product.
- Do not crush or chemically dissolve the product.

Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.

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