Application

- Low-loss SAW Extractor for GPS_GLONASS_BEIDOU systems
- Low amplitude ripple
- Low insertion attenuation

Features

- Ceramic Package for Surface Mounted Technology (SMT)
- RoHS compatible
- Package size 1.8*1.4mm
- Electrostatic Sensitive Device(ESD)

Electrical Specification Cell-ANT

Antenna terminating impedance: Z_{ANT}=50Ω

GNSS terminating impedance: Z_{GNSS}=50Ω

Cell terminating impedance: Z_{Cell}=50Ω

ITEM		Min.	Typ.	Max.	Unit	Note
Center Frequency		699 1710		1510.9 2690	MHz	
Maximum Insertion Loss	699~960MHz	-	1.1	1.8	dB	-30~85°C
Maximum Insertion Loss	1427.9~1510.9MHz		1.0	1.8	dB	-30~85°C
Maximum Insertion Loss	1710~2200MHz		1.5	2.0	dB	-30~85°C
Maximum Insertion Loss	2300~2690MHz		1.3	2.0	dB	-30~85°C
Maximum Insertion Loss	3400~3800MHz		/	/	dB	-30~85°C
Maximum Insertion Loss	699~960MHz		1.1	1.4	dB	RT(25°C)
Maximum Insertion Loss	1427.9~1510.9MHz		1.0	1.4	dB	RT(25°C)
Maximum Insertion Loss	1710~2200MHz		1.3	1.7	dB	RT(25°C)
Maximum Insertion Loss	2300~2690MHz		1.3	1.7	dB	RT(25°C)
Maximum Insertion Loss	3400~3800MHz		/	/	dB	RT(25°C)
Maximum Insertion Loss					dB	-10~85°C
Amplitude ripple@20MHz					dB	-30~85°C
Amplitude ripple@20MHz					dB	RT(25°C)
VSWR @Cell port	699~1510.9MHz 1710~2690MHz	-	1.5	2.2		-30~85°C
VSWR @Ant port	699~1510.9MHz 1710~2690MHz		1.5	2.2		-30~85°C
VSWR @Cell port			/	/		RT(25°C)
VSWR @Ant port			/	/		RT(25°C)

Attenuation	1559.052~1605.89MHz	3	8.5	--	dB	GNSS
Input / Output Impedance (Nominal)		50Ω/50Ω				

Electrical Specification Gass-ANT

Antenna terminating impedance: Z_{ANT}=50Ω

GNSS terminating impedance: Z_{GNSS}=50Ω

Cell terminating impedance: Z_{Cell}=50Ω

ITEM		Min.	Typ.	Max.	Unit	Note
Center Frequency		1559.05		1605.89	MHz	
Maximum Insertion Loss	1559.052~1563.144MHz	-	1.9	2.3	dB	-30~85°C
Maximum Insertion Loss	1574.42~1576.42MHz		1.0	1.4	dB	-30~85°C
Maximum Insertion Loss	1597.55~1605.89MHz		1.4	2.2	dB	-30~85°C
Maximum Insertion Loss	1559.052~1563.144MHz		1.9	2.2	dB	RT(25°C)
Maximum Insertion Loss	1574.42~1576.42MHz		1.0	1.2	dB	RT(25°C)
Maximum Insertion Loss	1597.55~1605.89MHz		1.4	2.0	dB	RT(25°C)
Maximum Insertion Loss					dB	-10-85℃
Amplitude ripple@20MHz					dB	-30~85°C
Amplitude ripple@20MHz					dB	RT(25°C)
VSWR @GNSS port	1559.052~1563.144MHz		1.5	2.0		-30~85°C
VSWR @GNSS port	1574.42~1576.42MHz		1.5	2.0		-30~85°C
VSWR @GNSS port	1597.55~1605.89MHz		1.5	2.0		-30~85°C
VSWR @Ant port	1559.052~1563.144MHz		1.6	2.0		-30~85°C
VSWR @Ant port	1574.42~1576.42MHz		1.6	2.0		-30~85°C
VSWR @Ant port	1597.55~1605.89MHz		1.6	2.0		-30~85°C
VSWR @GNSS port						RT(25°C)
VSWR @Ant port						RT(25°C)
Attenuation	100~915MHz	27	32		dB	LB TX
Attenuation	925~960MHz	27	33		dB	LB
Attenuation	1427.9~1462.9MHz	30	35		dB	MLB TX
Attenuation	1710~2025MHz	31	37		dB	MB TX
Attenuation	2110~2170MHz	30	40		dB	MB
Attenuation	2300~2400MHz	30	39		dB	HB TX
Attenuation	2400~2483MHz	30	35		dB	WIFI 2.4G
Attenuation	2500~2690MHz	29	36		dB	HB TX
Attenuation	3300~4200MHz	15	20		dB	n77
Attenuation	4400~5000MHz	10	16		dB	n79
Attenuation	5150~5850MHz	10	16		dB	WIFI 5G
Rx spurious(Rx port)					dBm/H	Pin=Pmax(CW)

					z	@Tx port
Input / Output Impedance (Nominal)		50Ω/50Ω				

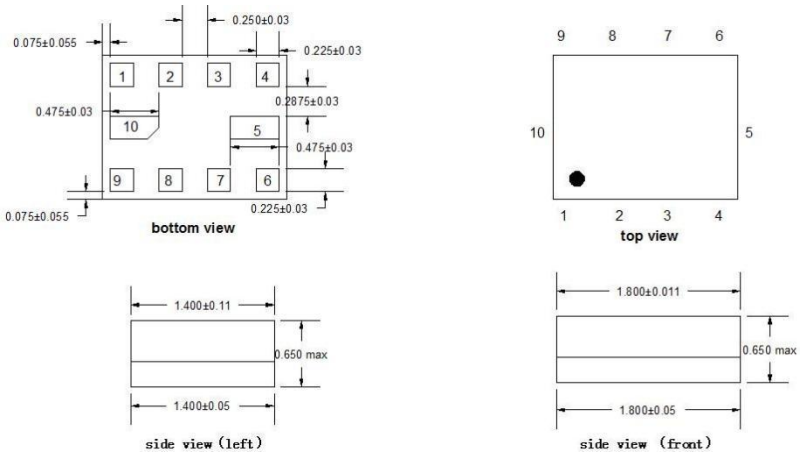
Electrical Specification Cell-GNSS

ITEM		Min.	Typ.	Max.	Unit	Note
Isolation	699~960MHz	25	32		dB	LB
Isolation	1427.9~1462.9MHz	30	41		dB	MLB TX
Isolation	1710~2025MHz	35	38		dB	MB
Isolation	2110~2170MHz	35	45		dB	MB
Isolation	2300~2690MHz	30	37		dB	HB
Isolation	1559.052~1605.89MHz	4	10		dB	GNSS

Maximum Ratings

Rating	Symbol	Value	Unit
Input RF Power (cell port: 699-960 MHz)	P	27dBm,CW,3000h,50℃	
Input RF Power (cell port: 1427.9-1510.9MHz)	P	27dBm,CW,3000h,50℃	
Input RF Power (cell port: 1710-2690MHz)	P	27dBm,CW,3000h,50℃	
Input RF Power (cell port: 824-849MHz Tx band)	P	35dBm, GSM signal, 1/8 duty cycle, 3000 h, 50°C	
Input RF Power (cell port: 880-915MHz Tx band)	P	35dBm, GSM signal, 1/8 duty cycle, 3000 h, 50°C	
Input RF Power (cell port: 1710-1785MHz Tx band)	P	32dBm, GSM signal, 1/8 duty cycle, 3000 h, 50°C	
Input RF Power (cell port: 1850-1910MHz Tx band)	P	32dBm, GSM signal, 1/8 duty cycle, 3000 h, 50°C	
Input RF Power (cell port: 1559.052-1605.89MHz B1 Rx band)	P	10dBm, CW, 3000 h, 50 °C	
Operating Temperature Range	T_A	-30 ~ +85	°C
Storage Temperature Range	Tstg	-40 ~ +85	°C
ESD Voltage (HBM)	V_{ESD}	> 100	V
ESD Voltage (CDM)	V_{ESD}	> 100	V
Moisture Sensitivity Levels	MSL	3	

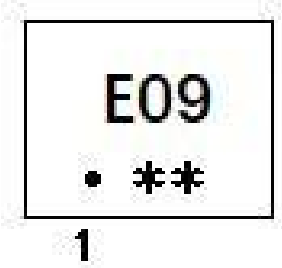
Outline Drawing



Pin Configuration

PIN#	Description
1	Unbalance Port (ANT port)
4	Unbalance Port
9	Unbalance Port (Cellular port)
2,3,5,6,7,8,10	To Be Grounded

Marking



Top View, Laser Marking

"E09": Part Number
"." Dot marking, indicates input

"1": Terminal 1

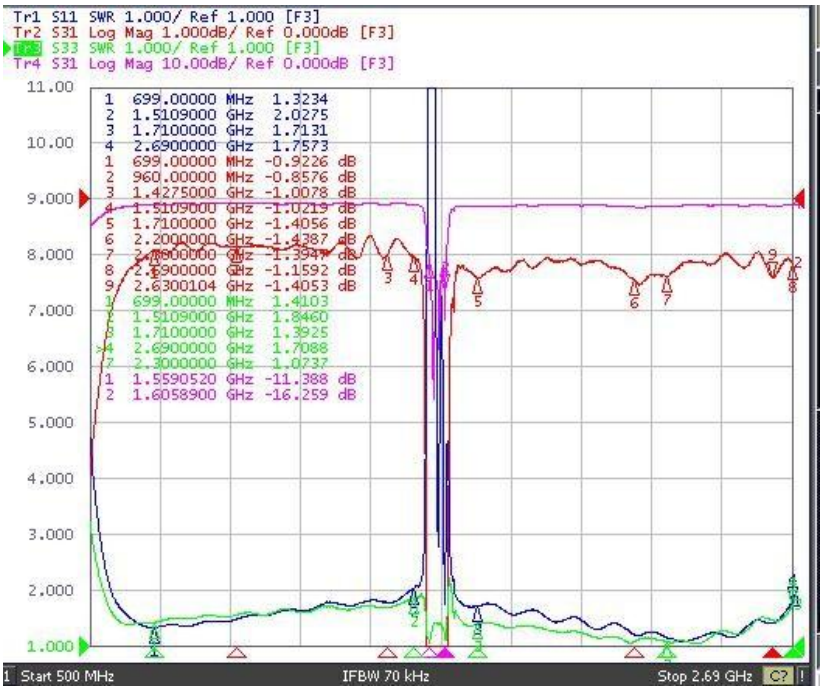
The first "*": Month Code (The code shown below varies in a 4-year-cycle)

Month	1	2	3	4	5	6	7	8	9	10	11	12
2016/2020	n	p	q	r	s	t	u	v	w	x	y	z
2017/2021	A	B	C	D	E	F	G	H	J	K	L	M
2018/2022	N	P	Q	R	S	T	U	V	W	X	Y	Z
2019/2023	a	b	c	d	e	f	g	h	i	j	k	m

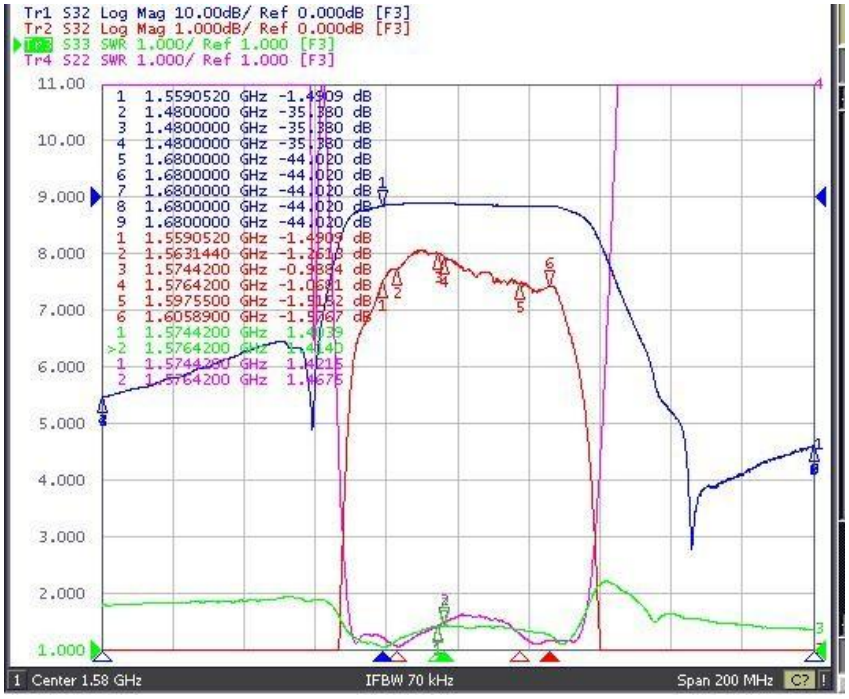
The second "*": Date Code

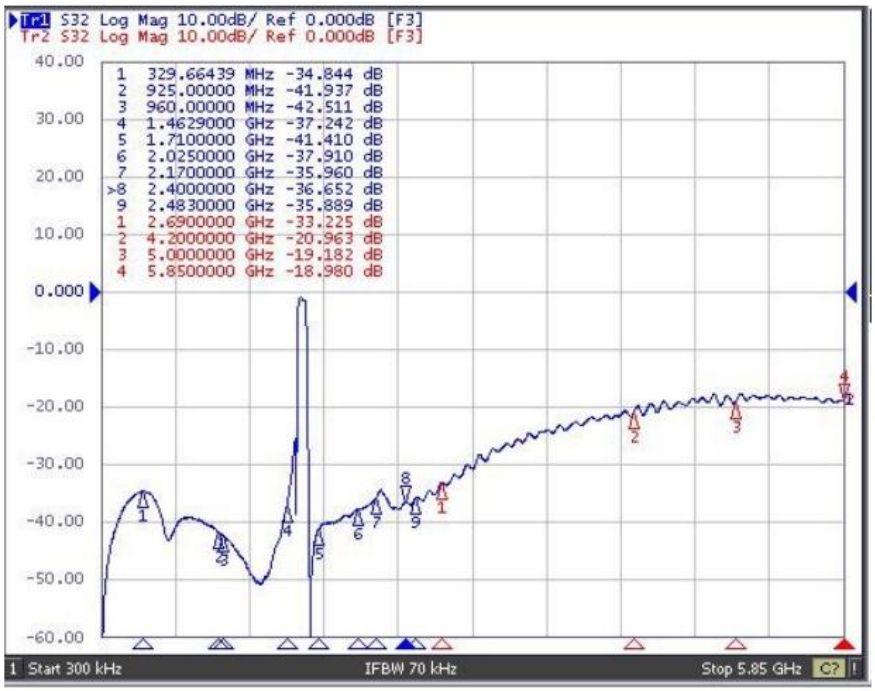
Date	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	
Code	A	B	C	D	E	F	G	H	J	K	
Date	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th	
Code	L	M	N	P	Q	R	S	T	U	V	
Date	21st	22nd	23rd	24th	25th	26th	27th	28th	19th	30th	31th
Code	W	X	Y	Z	a	b	d	e	f	g	h

Typical Frequency Response Cell-ANT

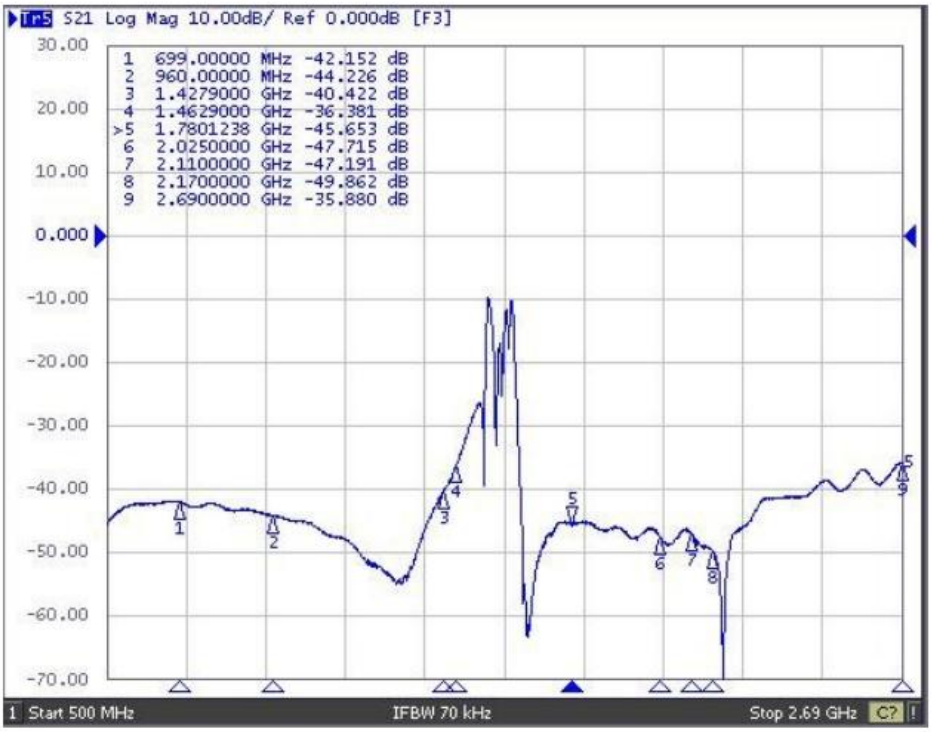


Typical Frequency Response ANT-GNSS

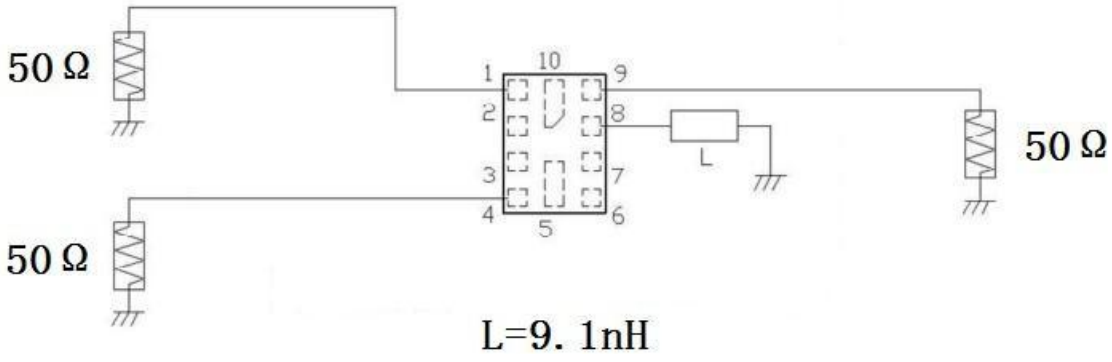




Typical Frequency Response Cell-GNSS



Test Circuit



Stability Characteristics

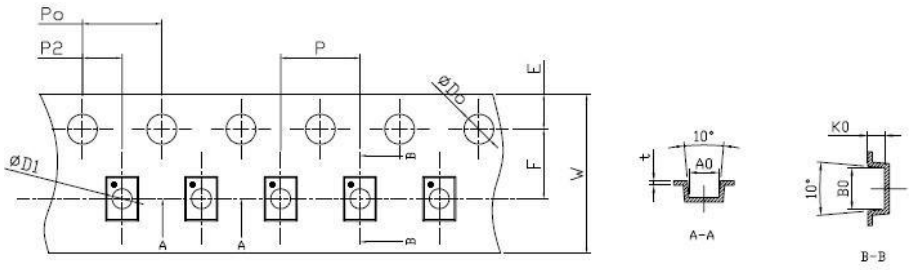
ITEM	Test Name	STD Reference	Test Conditions			Least lot
Precondition		JESD22-A113	1) Temperature Cycling, 5 cycles -40 ℃ (or lower) to 60℃(or higher); 2) Bake, 24 hrs @ 85±5℃; Moisture Soak, Soak time and conditions per IPC/JEDEC J-STD-020 based on device MSL level; Reflow, 3 reflow cycles using profiles per IPC/JEDEC J-STD-020, SnPb or Pb-free profile based on device end use process; Drying, Room ambient temperature.			All behind
1	Temperature Cycling	JESD22-A104	Temperature range -40 ℃ /85 ℃ , 5 15min dwell. Release after 500 cycles.			3*25 pcs
2	High Temperature Storage	JESD22-A103	Temperature = 85℃, 1000 hours.			3*25 pcs
3	Temperature Humidity no bias	JEDEC Std A101-B	85°C	85%RH	240 hours	3*25 pcs
4	Human Body Mode ESD	JESD22-A114	Ta=25C,>100V.			3 pcs
5	Charge Device Mode ESD	JESD22-C101	Ta=25C,>100V.			3 pcs
6	Solderability (lead-free)	JESD22-B102	Wetting: 245℃, 5s.			22 pcs
7	Drop Test	JESD22-B111	1500Gs,0.5millisecond duration, half-sine pulse.			20 pcs
8	Mechanical Shock	JESD-47	Shock pulse of 1500g with pulse duration of 0.5+/-0.1msec (X ,Y & Z); 5 shocks per axis.			3*25 pcs

Remarks

- SAW devices should not be used in any type of fluid such as water, oil, organic solvent, etc.
- Be certain not to apply voltage exceeding the rated voltage of components.
- Do not operate outside the recommended operating temperature range of components.
- Sudden change of temperature shall be avoided, deterioration of the characteristics can occur.
- Be careful of soldering temperature and duration of components when soldering.
- Do not place soldering iron on the body of components.
- Be careful not to subject the terminals or leads of components to excessive force.
- SAW devices are electrostatic sensitive. Please avoid static voltage during operation and storage.
- Ultrasonic cleaning shall be avoided. Ultrasonic vibration may cause destruction of components.

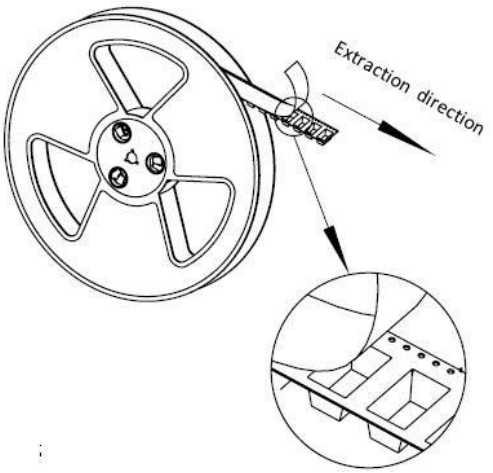
Packing Information

Carrier Tape



SYMBOL	E	F	P2	D0	D1	P0
SPEC	1.75±0.10	3.50±0.05	2.00±0.05	1.55±0.05	0.60±0.05	4.00±0.10
SYMBOL	W	P	A0	B0	K0	t
SPEC	8.00±0.10	4.00±0.10	1.60±0.05	2.10±0.10	0.80±0.05	0.30±0.10

Reel Dimensions

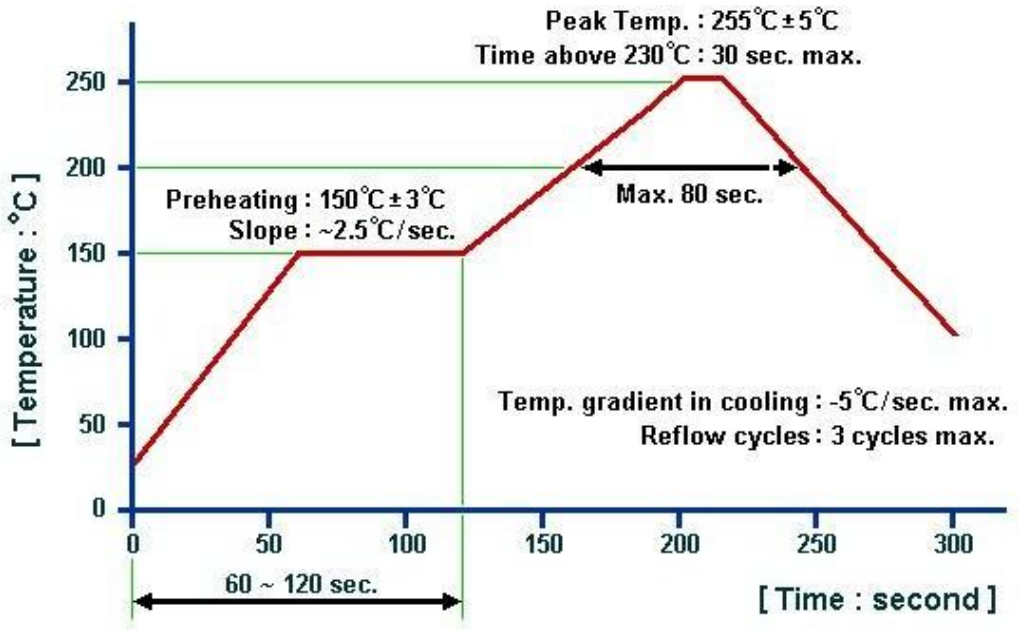


Material	PS
Unit	mm
Tolerance	±0.20 mm
Quantity	4000/reel

Outer Packing

Type	Quantity	Dimension	Description	Weight
Carton Box I	40000	240×210×285mm	anti-static plastic bag & carton box 1 reel / bag 10 bags / box (40000pcs)	1.66kg
Carton Box II	120000	470×310×285mm	30 bags / box (120000pcs)	4.64kg

Recommended Soldering Profile



Remarks:

1. The specifications of this device are subject to change or obsolescence without notice.
2. Typically, equipment utilizing this device requires emissions testing and government approval, which is the responsibility of the equipment manufacturer.
3. Our liability is only assumed for the Surface Acoustic Wave (SAW) component(s) per se, not for applications, processes and circuits implemented within components or assemblies.
4. For questions on technology, prices and delivery, please contact our sales offices or e-mail sales@sainty-tech.com.