RClamp1561PQ

Femto Farad RailClamp®
ESD Protection for RF Interfaces

PROTECTION PRODUCTS

Description

RClamp®1561PQ is a low capacitance ESD protection device specifically designed to protect high power RF interfaces. It offers desirable characteristics for board level protection including fast response time, low operating and clamping voltage, and no device degradation.

RClamp1561PQ is bidirectional and features a working voltage of 15V, high ESD withstand voltage (+/-10kV contact per IEC 61000-4-2), and low typical capacitance (0.25pF at V_R=15V). RClamp1561PQ has been specifically engineered to minimize harmonic distortion in RF circuits, including high and low GSM bands. This makes it ideal for use on RF, FM, GSM and other antenna circuits commonly found in mobile and automotive applications.

RClamp1561PQ is in a 2-pin SLP1006P2 package measuring 1.0 x 0.6 mm with a nominal height of only 0.50mm. Leads are finished with NiPdAu. This device is qualified to AEC-Q100.

Features

- High ESD withstand voltage
  - IEC 61000-4-2 (ESD) 15kV (air), 10kV (contact)
- Low capacitance: 0.25pF Typical
- Qualified to AEC-Q100, Grade 1
- Protects one high-speed line
- Working voltage: ±15V
- Low reverse leakage current
- Solid-state silicon-avalanche technology

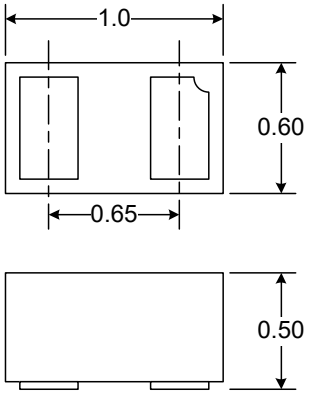
Mechanical Characteristics

- SLP1006P2 Package
- Pb-Free, Halogen Free, RoHS/WEEE Compliant
- Nominal Dimensions: 1.0 x 0.60 x 0.50 mm
- Lead Finish: NiPdAu
- Marking: Marking Code
- Packaging: Tape and Reel

Applications

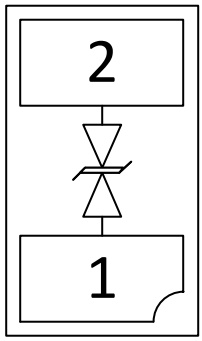
- RF Antenna
- GPS Antenna
- FM Antenna
- Bluetooth Circuits
- Automated Meter Reading
- Automotive and Industrial Equipment

Nominal Dimensions



Nominal Dimensions in mm

Schematic and Pin Configuration



SLP1006P2 (Bottom View)

Absolute Maximum Ratings

Rating	Symbol	Value	Units
Peak Pulse Power (t_p = 8/20µs)	P_{PK}	70	W
Peak Pulse Current (t_p = 8/20µs)	I_{PP}	2	A
ESD per IEC 61000-4-2 (Air)(1) ESD per IEC 61000-4-2 (Contact)(1)	V_{ESD}	±15 ±10	kV
Operating Temperature	T_J	-40 to +125	°C
Storage Temperature	T_{STG}	-55 to +150	°C

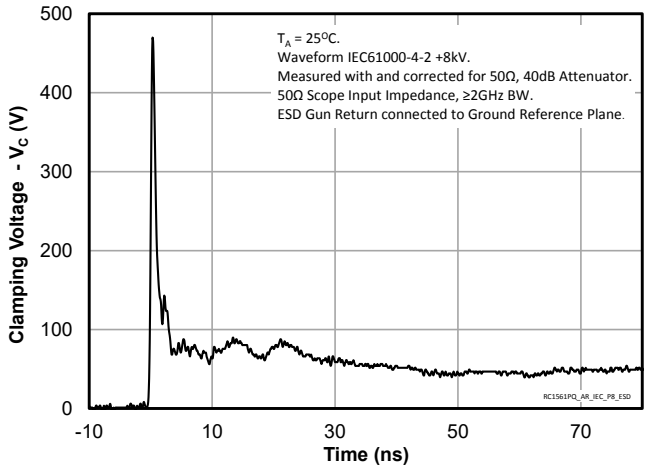
Electrical Characteristics (T=25°C unless otherwise specified)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Units
Reverse Stand-Off Voltage	V_{RWM}	-40°C to 125°C				15	V
Reverse Breakdown Voltage	V_{BR}	I_t = 1mA	-40°C to 125°C	16.5	19	20.5	V
Reverse Leakage Current	I_R	V_{RWM} = 15V	T = 25°C		<5	50	nA
			T = 125°C		<5	100	nA
Clamping Voltage	V_C	I_{PP} = 2A, t_p = 8/20µs			32	35	V
ESD Clamping Voltage[2]	V_C	I_{PP} = 4A, t_p = 0.2/100ns (TLP)			29.5		V
ESD Clamping Voltage[2]	V_C	I_{PP} = 16A, t_p = 0.2/100ns (TLP)			76		V
Dynamic Resistance[2, 3]	R_{DYN}	t_p = 0.2/100ns (TLP)			3.8		Ohms
Junction Capacitance	C_J	V_R = 15V, f = 1MHz	T = 25°C		0.25	0.3	pF
Cutoff Frequency	F_C	-3dB		>20			GHz

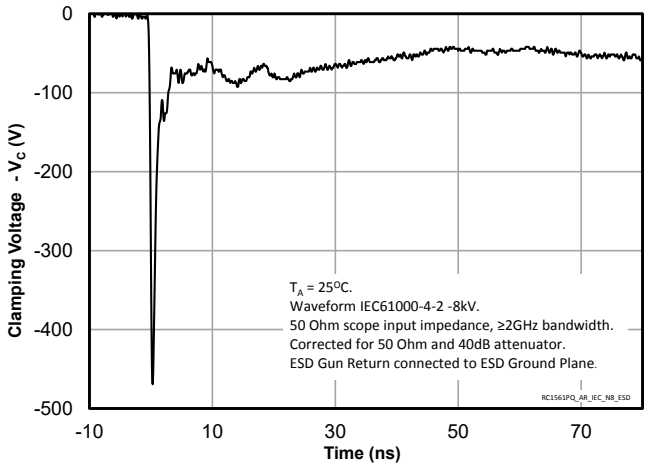
Notes:
(1): ESD gun return path connected to Ground Reference Plane (GRP)
(2): Transmission Line Pulse Test (TLP) Settings: tp = 100ns, tr = 0.2ns, I_{TLP} and V_{TLP} averaging window: t_1 = 70ns to t_2 = 90ns
(3): Dynamic resistance calculated from I_{TLP} = 4A to I_{TLP} = 16A

Typical Characteristics

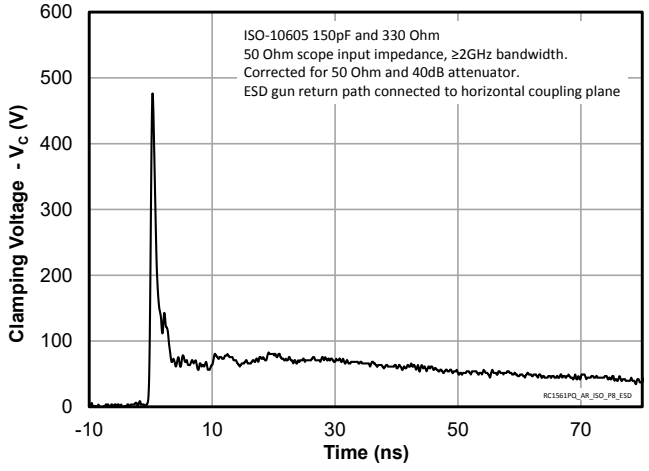
ESD Clamping (+8kV Contact per IEC 61000-4-2)



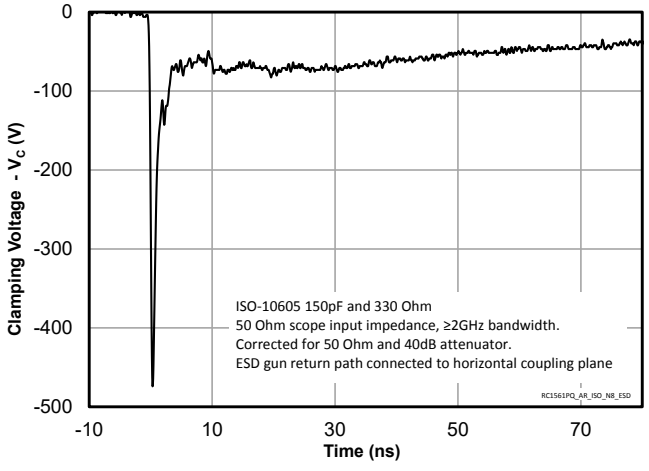
ESD Clamping (-8kV Contact per IEC 61000-4-2)



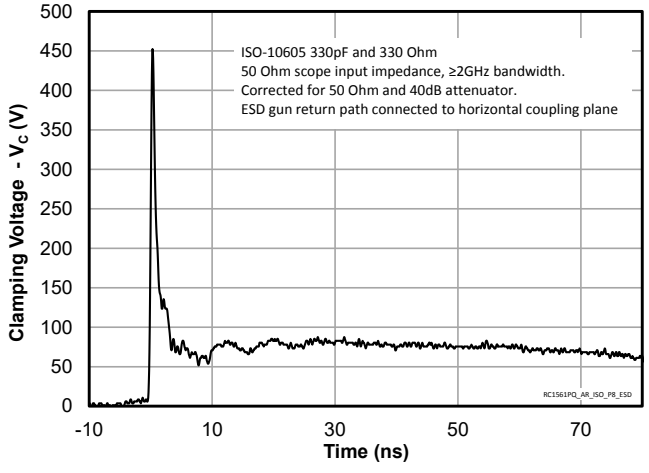
ESD Clamping (+8kV Contact per ISO-10605 150pF, 330Ω)



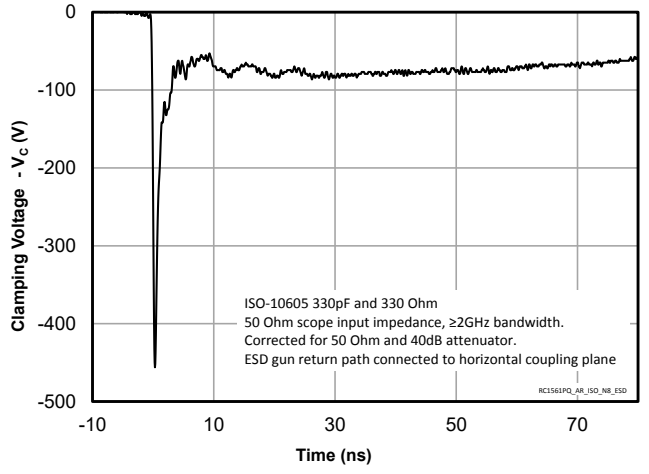
ESD Clamping (-8kV Contact per ISO-10605 150pF, 330Ω)



ESD Clamping (+8kV Contact per ISO-10605 330pF, 330Ω)

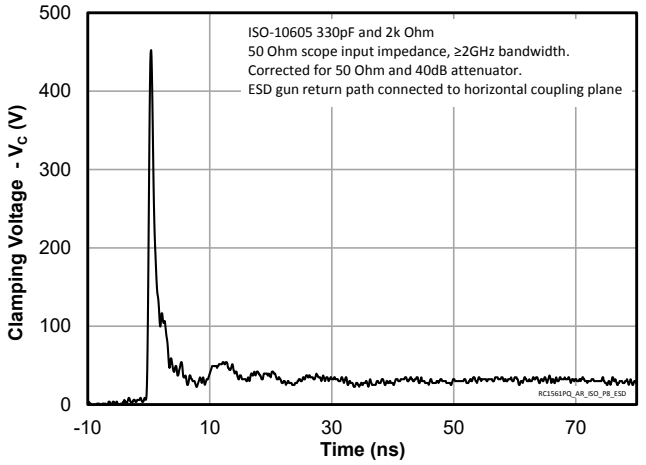


ESD Clamping (-8kV Contact per ISO-10605 330pF, 330Ω)

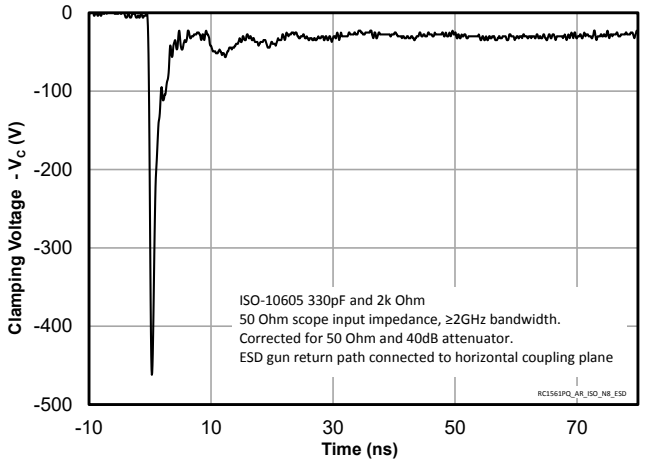


Typical Characteristics (Continued)

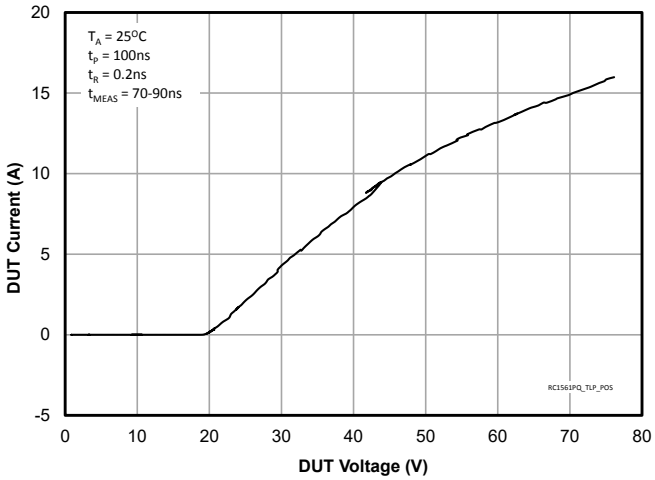
ESD Clamping (+8kV Contact per ISO-10605 330pF, 2kΩ)



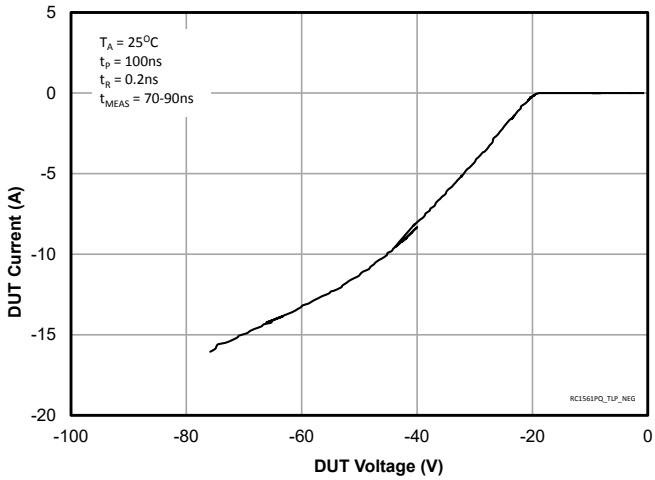
ESD Clamping (-8kV Contact per ISO-10605 330pF, 2kΩ)



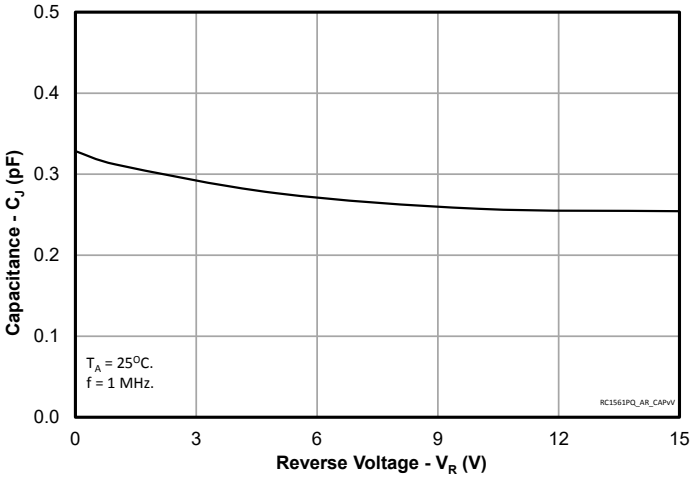
TLP Characteristic (Positive Pulse)



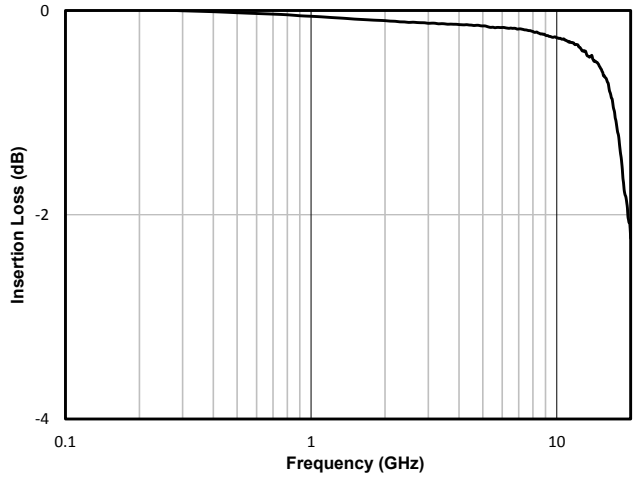
TLP Characteristic (Negative Pulse)



Capacitance vs. Reverse Voltage

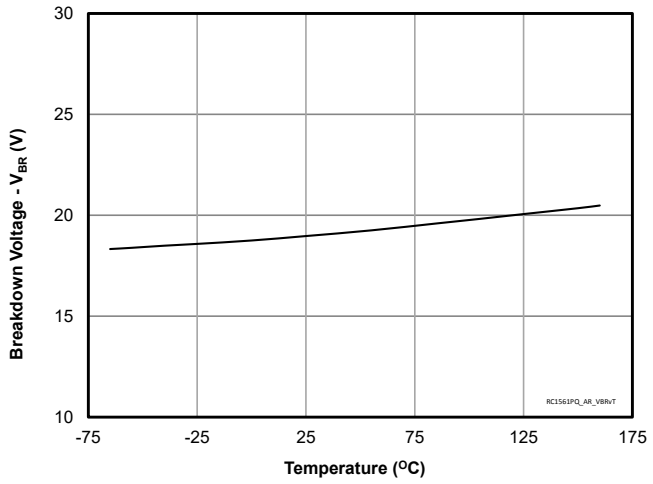


Insertion Loss (S21)

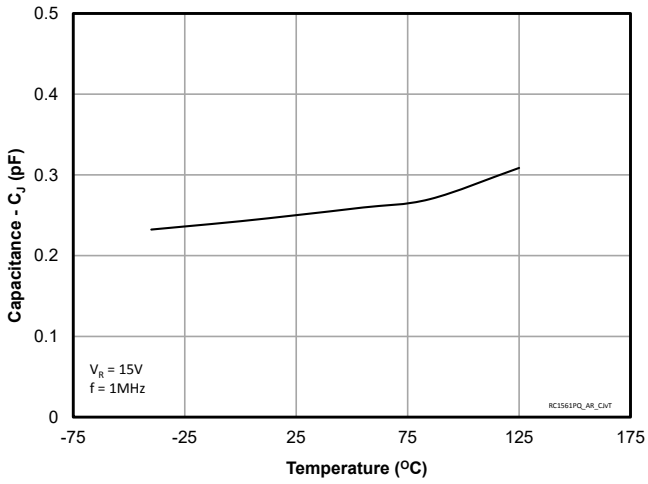


Typical Characteristics (Continued)

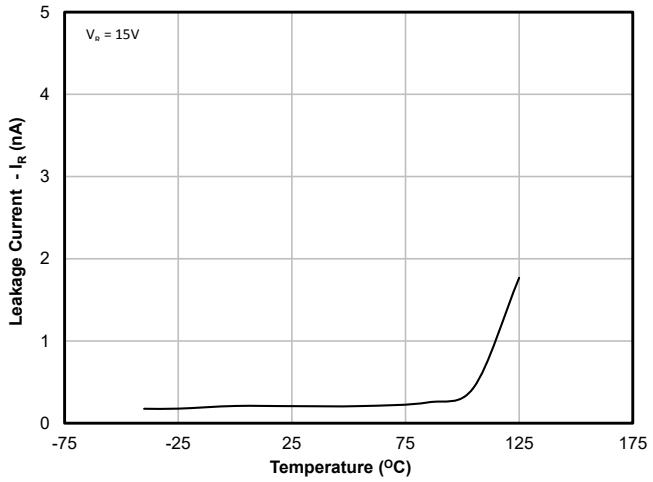
Breakdown Voltage vs. Temperature



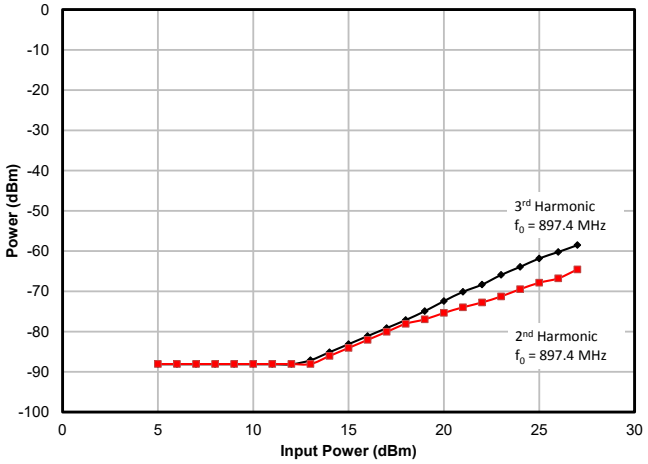
Capacitance vs. Temperature



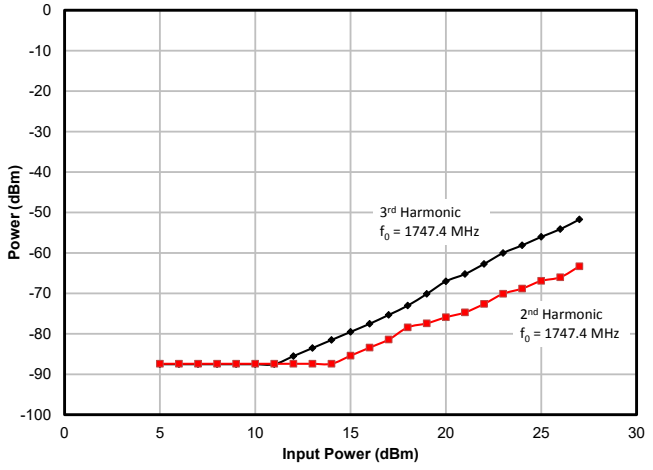
Leakage Current vs. Temperature



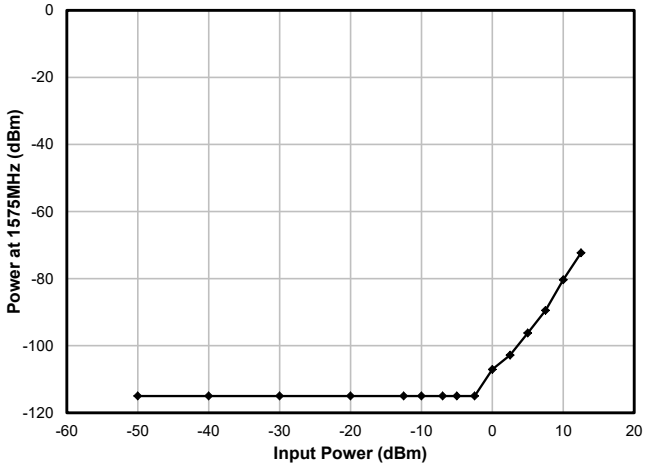
Harmonic Generation - GSM Low Band



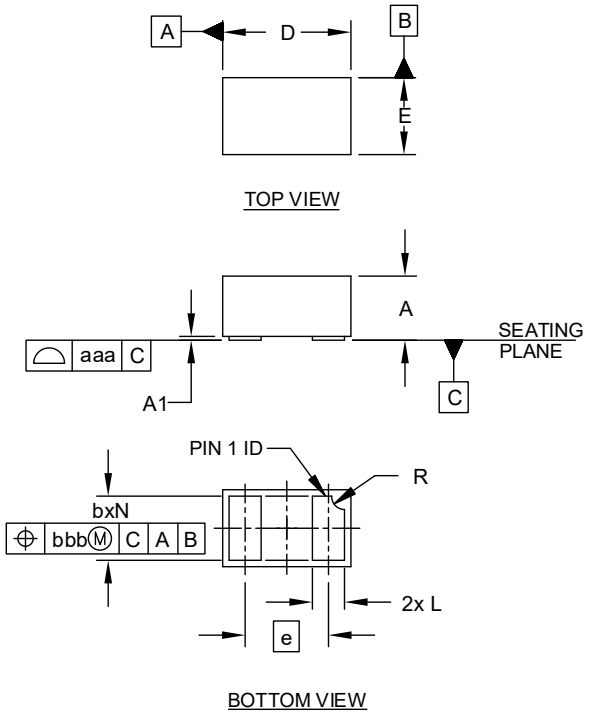
Harmonic Generation - GSM High Band



Intermodulation Distortion (Input: 760MHz + 815 MHz)



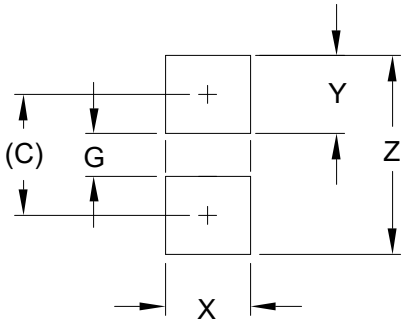
Outline Drawing - SLP1006P2



DIMENSIONS			
DIM	MILLIMETERS		
	MIN	NOM	MAX
A	0.47	0.50	0.53
A1	0.00	0.03	0.05
b	0.45	0.50	0.55
D	0.95	1.00	1.05
E	0.55	0.60	0.63
e	0.65 BSC		
L	0.20	0.25	0.30
R	0.05	0.10	0.15
N	2		
aaa	0.08		
bbb	0.10		

NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).

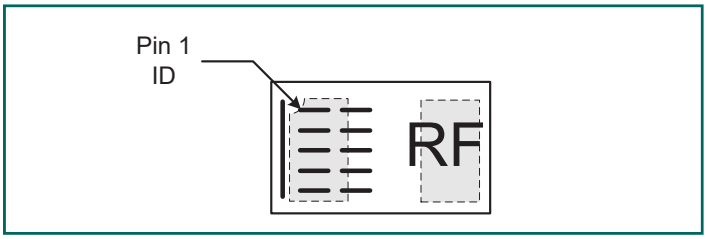
Land Pattern - SLP1006P2



DIMENSIONS	
DIM	MILLIMETERS
C	(0.85)
G	0.30
X	0.60
Y	0.55
Z	1.40

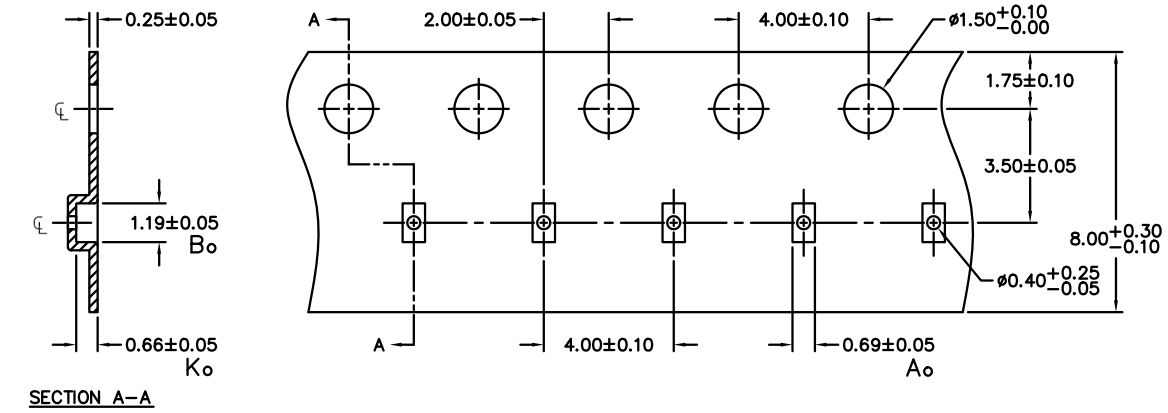
NOTES:
1. CONTROLLING DIMENSIONS ARE IN MILLIMETERS (ANGLES IN DEGREES).
2. THIS LAND PATTERN IS FOR REFERENCE PURPOSES ONLY. CONSULT YOUR MANUFACTURING GROUP TO ENSURE YOUR COMPANY'S MANUFACTURING GUIDELINES ARE MET.

Marking Code

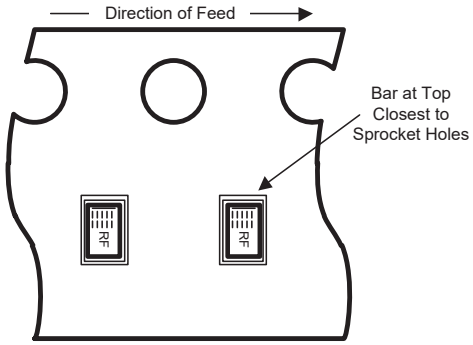


Notes:
1) Device is electrically symmetrical
2) Dashes indicate line matrix date code
3) Bar indicates Pin 1 location

Tape and Reel Specification



NOTES: 1.) ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.



Ordering Information

Part Number	Qty per Reel	Reel Size
RClamp1561PQTCT	3,000	7 Inch

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Contact Information

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