Datasheet

GSR5755

5 GHz WLAN Front End Module

Product Description

The GSR5755 is a highly integrated, 5 GHz front end module (FEM) incorporating a 5 GHz single-pole, double-way throw (SP2T) transmit/receive (T/R) switch, a 5 GHz low noise amplifier (LNA) with bypass, and a 5 GHz power amplifier (PA) intended for 802.11ax applications and systems.

The device is provided in a compact, 16 pin 3 x 3 mm Quad Flat No Lead (QFN) package. Integrated die level filtering for 2nd and 3rd harmonics as well as 2.4 GHz rejection for DBDC operation are included. An integrated power detector is included to provide closed-loop power control within the system. The small form factor and integrated matching minimizes layout area in the application and greatly reduce the number of external components.

The pin configuration and package are shown in Figure 1. A functional block diagram is shown in Figure 2. Signal pin assignments and functional pin descriptions are provided in Table 1.

Pin Map

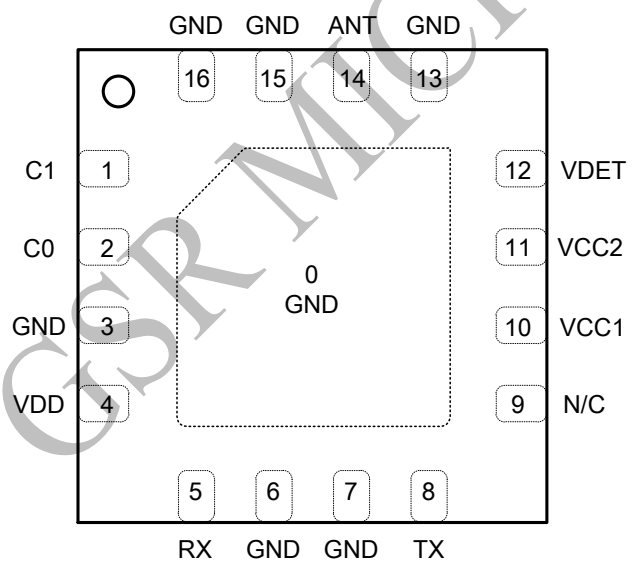


Figure 1 GSR5755 Pin Map (Top View)

Functional Block Diagram

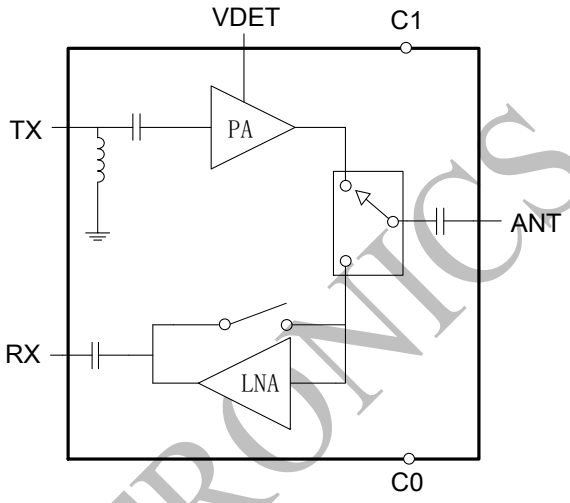


Figure 2 Block Diagram

Key Features

- Integrated 802.11ax 5 GHz PA, LNA with bypass, and T/R switch
- Fully matched input and output
- Pout = +20 dBm MCS11 -43dB EVM
- Pout = +22.5 dBm MCS9 -35 dB EVM
- Pout= +23.5 dBm MCS7 -30 dB EVM
- Transmit gain: 31 dB
- Receive gain: 13 dB
- 2 dB Noise Figure
- Small QFN (16 pin, 3 x 3 mm) Package

Applications

- 802.11ax networking and personal computing systems
- WLAN enabled wireless video systems
- Access points
- Wireless Routers
- Residential Gateways

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Pin Description

Pin	Name	Description
0	GND	Backside Paddle, RF/DC ground. Use recommended via pattern to minimize inductance and thermal resistance. See PCB Mounting Pattern for suggested footprint.
1	C1	Control logic 1
2	C0	Control logic 0
3	GND	Ground
4	VDD	LNA and logic supply voltage
5	RX	RF receive output
6	GND	Ground
7	GND	Ground
8	TX	RF transmit input
9	N/C	Not connected
10	VCC1	PA supply voltage
11	VCC2	PA supply voltage
12	VDET	Detector output voltage
13	GND	Ground
14	ANT	Antenna
15	GND	Ground
16	GND	Ground

Table 1 GSR5755 Pin Description

Absolute Maximum Ratings

Parameter	Conditions	Rating
DC Supply Voltage	VCC1, VCC2, VDD	-0.3 to +6 V
Control Voltage	C1, C0	-0.3 to VDD V
Storage Temperature		-40 to 150 ℃
Junction Temperature		Max 150 ℃
RF Input Power at TX	ANT connect 50 Ω Load, CW	+10 dBm
RF Input Power at ANT	RX connect 50 Ω Load, CW	+10 dBm

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability.

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Recommended Operating Conditions

Parameter	Min	Typ	Max	Units
Operating Frequency	5150	-	5850	MHz
DC Supply Voltage	3	5	5.2	V
Control Voltage – High	1.2	-	3.6	V
Control Voltage – Low	0	-	0.3	V
Control Current (I-high)	-	8	-	uA
Operating temperature	-40	25	85	℃

Logic Truth Table

Mode	C0	C1
Transmit Mode	Low	High
Receive LNA Mode	High	Low
Receive Bypass Mode	High	High
Shut Down Mode	Low	Low

Electrical Specifications

Parameter	Conditions	Min	Typ	Max	Units
Transmit Mode	Unless otherwise noted: VCC1, VCC2, VDD = 5.0 V, Temp = +25 ºC, C1 = 3.3 V, C0 = 0 V				
11ax HE160 Output Power	MCS11 1024QAM		18		dBm
Dynamic EVM			-43		dB
11ax HE160 Output Power	MCS11 1024QAM		20		dBm
Dynamic EVM			-40		dB
11ax HE80 Output Power	MCS11 1024QAM		20		dBm
Dynamic EVM			-43		dB
11ax HE80 Output Power	MCS11 1024QAM		21		dBm
Dynamic EVM			-40		dB
11ac VHT80 Output Power	MCS9 256QAM		22.5		dBm
Dynamic EVM			-35		dB
11n HT40 Output Power	MCS7 64QAM		23.5		dBm
Dynamic EVM			-30		dB
11n HT20 MCS0/ 11a 6M Output Power	Mask compliance		26		dBm
Small signal gain			31		dB
OP1dB	Output 1 dB Compression Point		30		dBm

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Gain flatness	Across any 160MHz bandwidth		±0.5		dB
TX Port Return Loss			10		dB
ANT Port Return Loss			8		dB
Isolation	From TX to RX Port		30		dB
Quiescent Current	RF OFF		215		mA
Operating Current	Pout = 18 dBm		255		mA
	Pout = 22.5 dBm		305		mA
	Pout = 26 dBm		380		mA
VDET Voltage	RF OFF		0.35		V
	Pout=18 dBm, HE160 MCS11		0.60		V
	Pout=22.5dBm, VHT80 MCS9		0.80		V
	Pout=26 dBm, HT20 MCS0		1.1		V
2nd Harmonics	Pout=26 dBm, HT20 MCS0		-35		dBm/MHz
3rd Harmonics	Pout=26 dBm, HT20 MCS0		-35		dBm/MHz
Switching Time	Receive LNA or Bypass Mode to Transmit Mode		400		nS
Stability	HT20 MCS0, Pout = 26 dBm, 0.1 GHz to 20 GHz, load VSWR= 6:1	All non-harmonically related outputs < -42 dBm/MHz			
Ruggedness	HT20 MCS0, Pout = 28 dBm, load VSWR 10:1	No damage			
Transmit Mode (3.3V Power Supply)	Unless otherwise noted: VCC1, VCC2, VDD = 3.3 V, Temp = +25 ºC, C1 = 3.3 V, C0 = 0 V				
11ax HE160 Output Power	MCS11 1024QAM		15		dBm
Dynamic EVM			-43		dB
11ax HE160 Output Power	MCS11 1024QAM		17		dBm
Dynamic EVM			-40		dB
11ax HE80 Output Power	MCS11 1024QAM		17		dBm
Dynamic EVM			-43		dB
11ax HE80 Output Power	MCS11 1024QAM		18		dBm
Dynamic EVM			-40		dB
11ac VHT80 Output Power	MCS9 256QAM		19		dBm
Dynamic EVM			-35		dB
11n HT40 Output Power	MCS7 64QAM		20		dBm
Dynamic EVM			-30		dB
11n HT20 MCS0/ 11a 6M Output Power	Mask compliance		23		dBm
Small signal gain			31		dB
OP1dB	Output 1 dB Compression Point		26.5		dBm
Quiescent Current	RF OFF		190		mA
Operating Current	Pout = 15 dBm		220		mA
	Pout = 19 dBm		245		mA
	Pout = 23 dBm		310		mA

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VDET Voltage	RF OFF		0.35		V
	Pout=15 dBm, HE160 MCS11		0.55		V
	Pout=19dBm, VHT80 MCS9		0.72		V
	Pout=23 dBm, HT20 MCS0		0.92		V
Receive LNA Mode	VCC1, VCC2, VDD = 5.0 or 3.3 V, Temp = +25 ºC, C1 = 0 V, C0 = 3.3 V				
Noise Figure			2.0		dB
Gain			13		dB
Out of Band Gain	f = 2400 ~ 2500 MHz		-17		dB
RX Port Return Loss			6		dB
ANT Port Return Loss			4		dB
Quiescent Current			25		mA
Input P1dB			-6		dBm
Switching Time	Transmit to Receive LNA Mode		1000		nS
Receive Bypass Mode	Unless otherwise noted: VCC1, VCC2, VDD = 5.0 or 3.3 V, Temp = +25 ºC, C1 = 3.3 V, C0 = 3.3 V				
Insertion Loss			-3.2		dB
RX Port Return Loss			17		dB
ANT Port Return Loss			12		dB
Quiescent Current	RF OFF		140		uA
Switching Time	Receive LNA to Receive Bypass Mode		100		nS
Shut Down Mode	Unless otherwise noted: VCC1, VCC2, VDD = 5.0 V, Temp = +25 ºC, C1 = 0 V, C0 = 0 V				
Quiescent Current			20		uA
Isolation	From TX to RX Port		32		dB
	From ANT to RX Port		45		dB
	From ANT to TX Port		50		dB

Application Schematic

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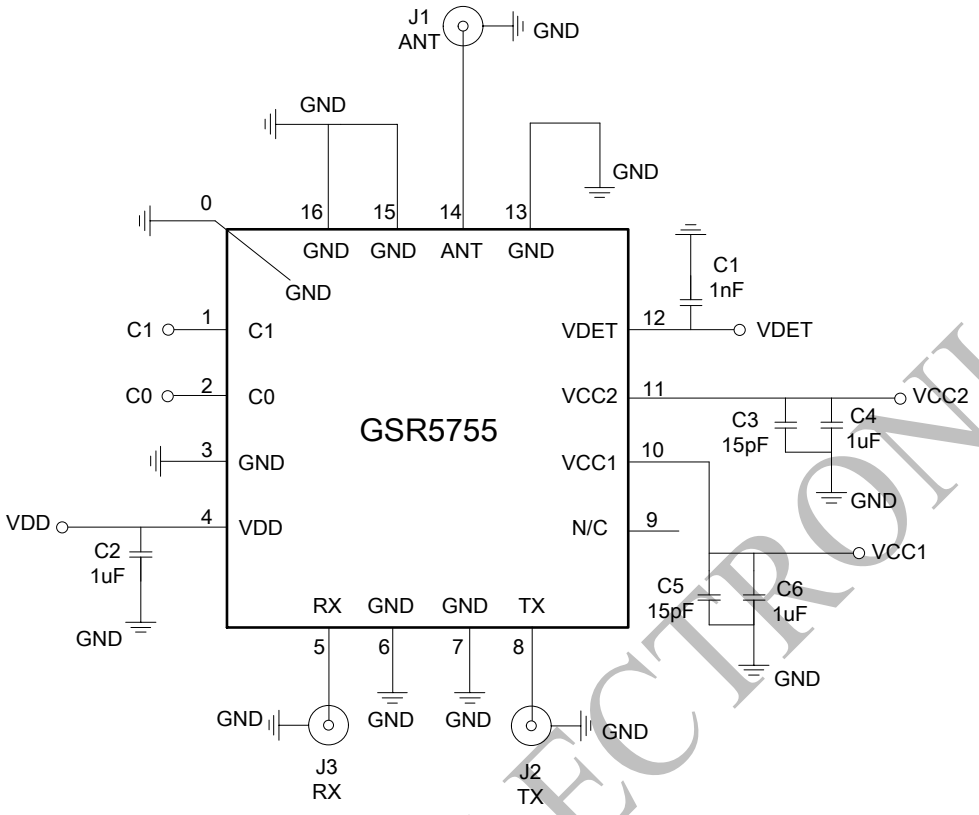


Figure 3 GSR5755 Application Schematic

Part Marking

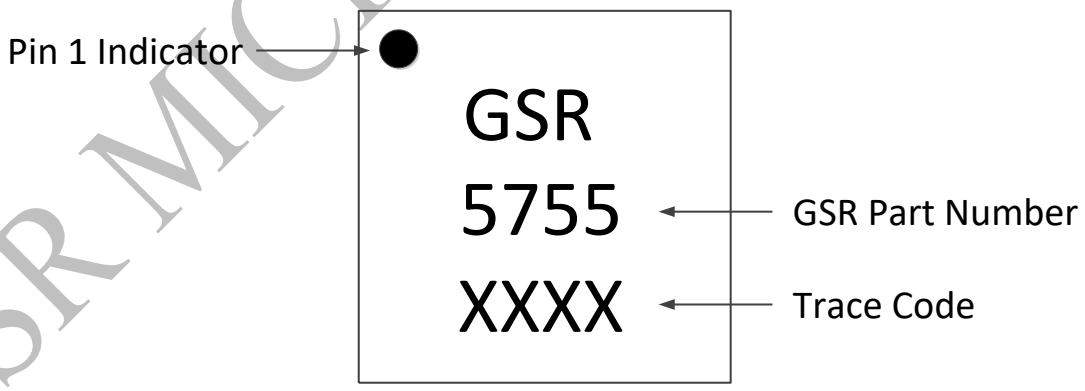


Figure 4 GSR5755 Marking

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Package Outline

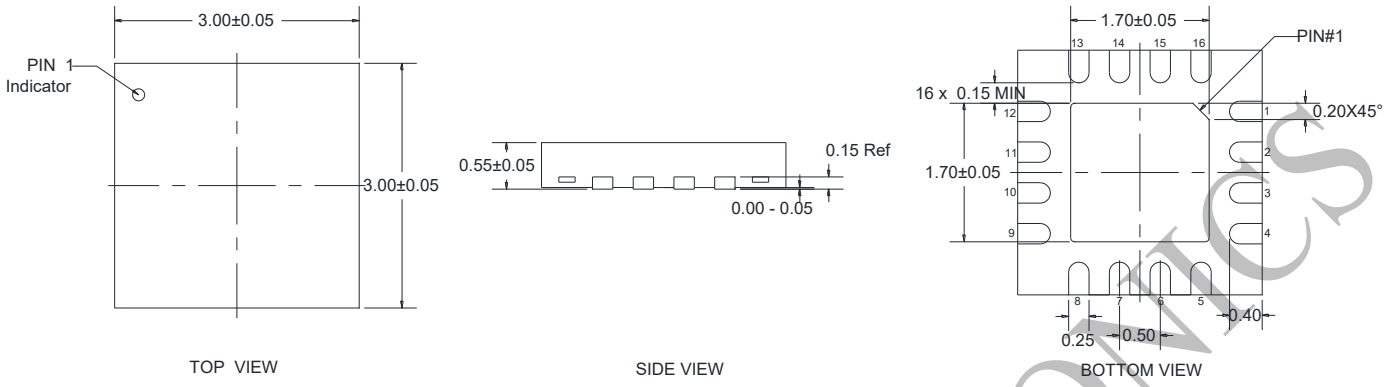


Figure 5 GSR5755 Package Outline

Notes: All dimensions are in millimeters.

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Recommended PCB Patterns

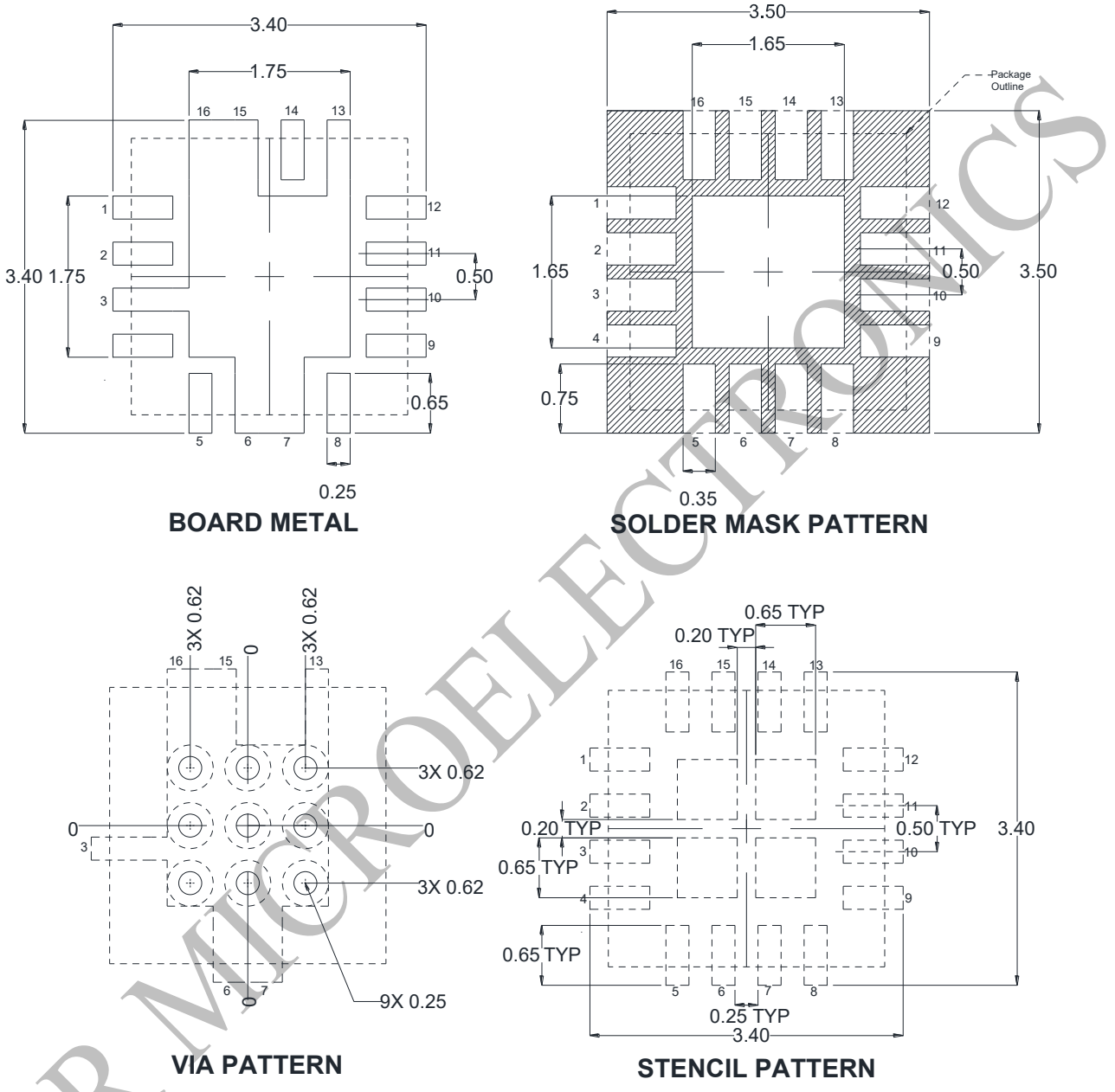


Figure 6 GSR5755 Recommended PCB Footprint

Notes: All dimensions are in millimeters.

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ESD Sensitivity Ratings

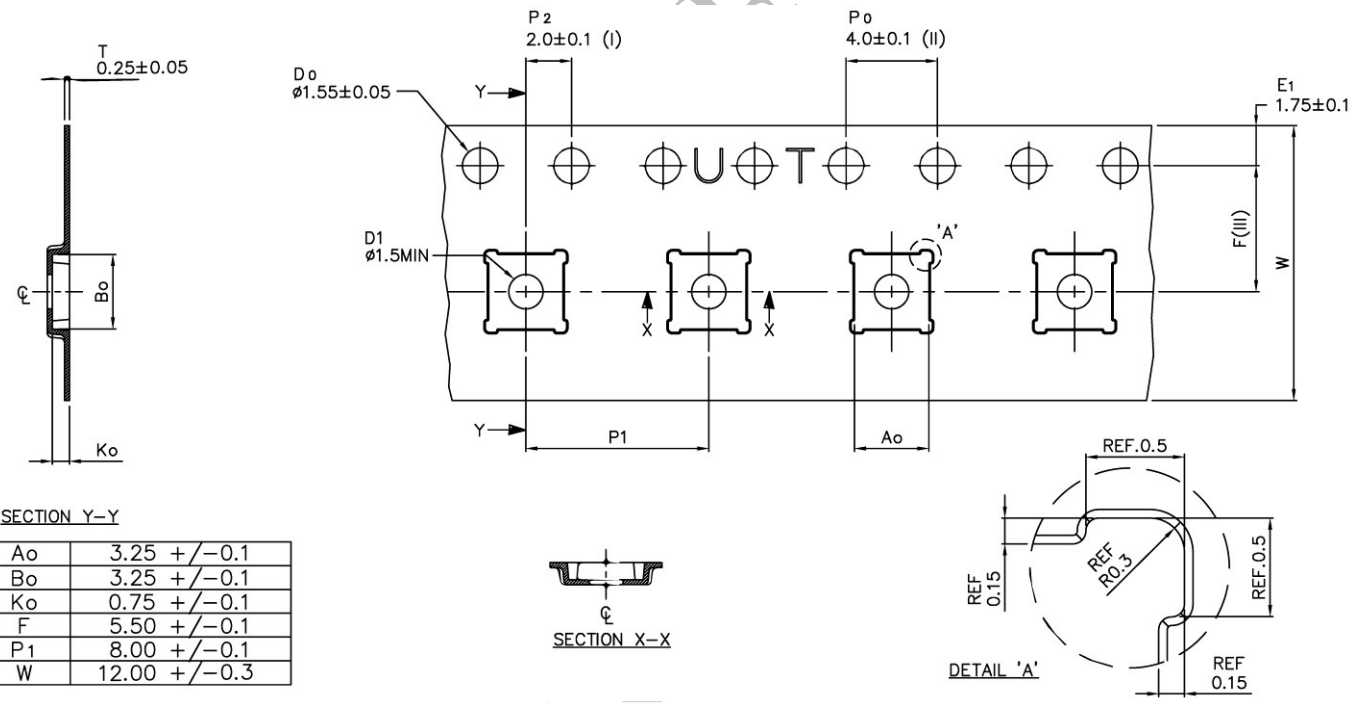
Test Model	ESD Rating	Value	Standard
Human Body Model (HBM)	Class 1C	≥ 1000 V	JEDEC Standard JESD22-A114
Charged Device Model (CDM)	Class C3	≥ 1000V	JEDEC Standard JESD22-C101

Caution: Industry-standard ESD precautions should be used at all times.

MSL Rating

MSL Rating	Standard
3	JEDEC Standard IPC/JEDEC J-STD-020

Tape and Reel Information

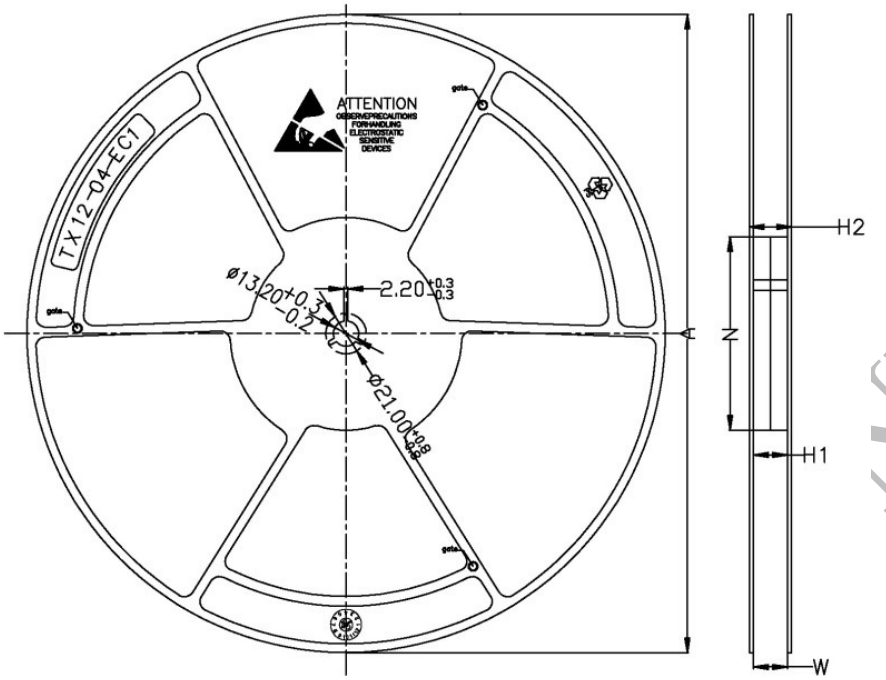


SECTION Y–Y

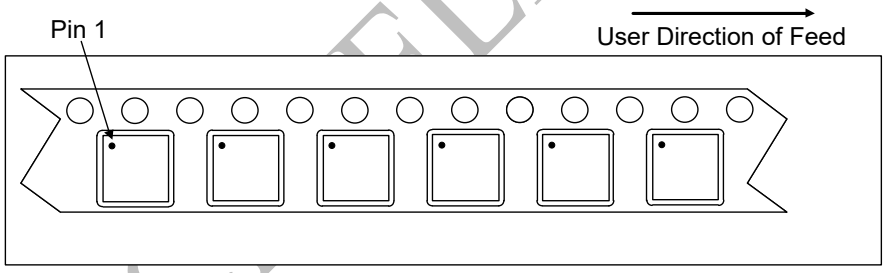
Ao	3.25 +/−0.1
Bo	3.25 +/−0.1
Ko	0.75 +/−0.1
F	5.50 +/−0.1
P1	8.00 +/−0.1
W	12.00 +/−0.3

SECTION X–X

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PRODUCT SPECIFICATIONS					
TAPE WIDTH	øA	øN	H1	H2	W
12MM	330	100	12.4	16.6	12.4

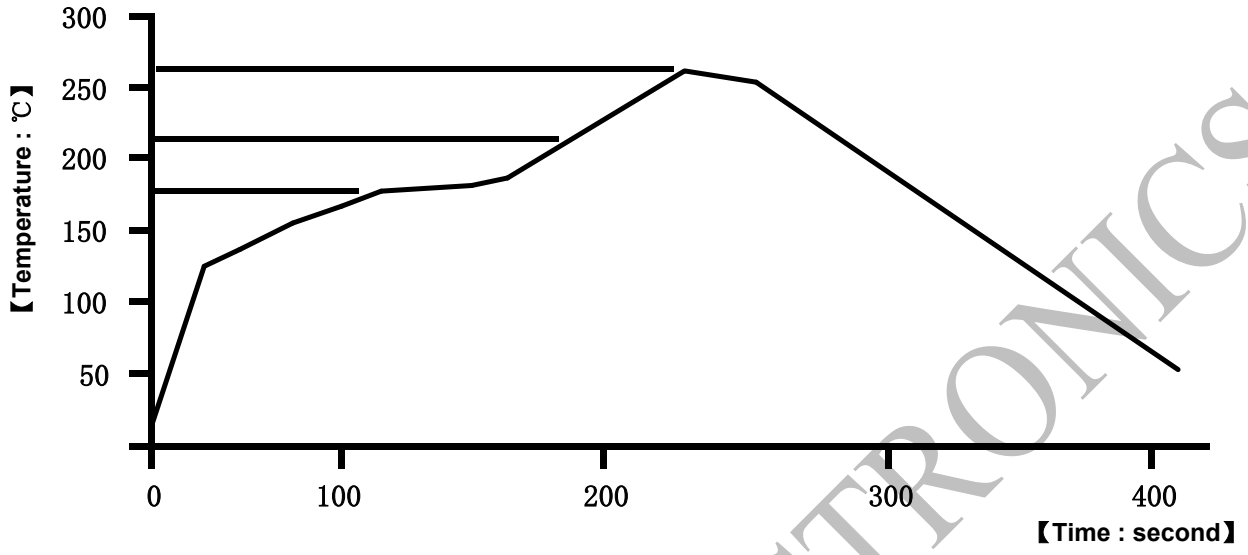


Notes: All dimensions are in millimeters.

Ordering Information

Part Number	Product Description	Package Type	Package Quantity
GSR5755	5.8GHz WLAN Front End Module	13” tape and reel	3000 pcs/ reel

Recommended IR Reflow Profile



Average ramp-up rate(200 ℃ to peak)	3°C/second max.
Preheat temperature 175(±25) ℃	60~120 secs
Temperature maintained above 217℃	60~150 secs
Time within 5℃ of actual peak temperature	30 seconds min.
Peak temperature range	(260±2) ℃
Ramp down rate	6°C/second max.
Time 25 ℃ to peak temperature	8 minutes max.

Follow JEDEC spec J-STD-020D

RoHS Compliant

The product does not contain lead, mercury, cadmium, hexavalent chromium, poly brominated biphenyls (PBB) or poly brominated diphenyl ethers (PBDE), and are therefore considered RoHS compliant.

Contact Information

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