

ELECTRICAL SPECIFICATIONS

Absolute Minimum and Maximum Ratings

Table 1. Minimum and Maximum Ratings

Parameter		Specifications			
Description	Pin	Min.	Max.	Unit	Comments
Supply Voltage	VCC		5.5	V	
Bias Supply	VBIAS		5.5	V	
PA enable	PAEN		4.5	V	
Switch Control	SW0, SW1		4.5	V	
RF Input Power	RFIN		15	dBm	
Channel Temperature			150	°C	
Storage Temperature		-65	150	°C	

Table 2. Operating Range

Parameter		Specifications				Comments
Description	Pin	Min.	Typical	Max.	Unit	
Supply Voltage	VCC	3.0	3.3	4.2	V	
Bias Supply	VBIAS	3.0	3.3	4.2	V	
				16	mA	
PA enable	PAEN	2.7	2.9	3.3	V	
				2.0	mA	
Switch Control	SW0	2.7	2.9	3.6	V	RX Mode
				200	μA	
	SW1	2.7	2.9	3.6	V	TX Mode
				200	μA	
RF Output Power	ANT		15		dBm	
Frequency Range		5.1		5.9	GHz	
Thermal Resistance, θ_{jc}			29.8		°C/W	Channel to board
Case Temperature		-30		+85	°C	

Electrical Specifications

All data measured on an Avago demo board at $V_{dd} = 3.3\text{ V}$, $T_c = 25^\circ\text{ C}$, $50\ \Omega$ at all ports. Unless otherwise specified, all data is taken at 54 Mbps 64QAM modulated signal per IEEE 802.11a with 20 MHz BW at 5.1 – 5.9 GHz. For TX mode PAEN = SW1 = 2.9 V, SW0 = 0 V. For RX mode SW0 = 2.9 V, PAEN = SW1 = 0 V.

Table 3. RF Electrical Characteristics

Parameter	Performance			Unit	Comments
	Min.	Typical	Max.		
Input Return Loss		-15		dB	TX and RX ports
Antenna Switch Switching Time		100		nS	
WiFi TX Path					
Gain	25	28		dB	
Gain Variation over any 20 MHz		± 0.25		dB	
Mask compliant OFDM output power	15			dBm	.11a 64QAM
EVM		-32.5	-31.0	dB	Pout = 15 dBm
		-35			Pout = 12 dBm
Total DC Current		105	120	mA	Pout = 15 dBm
		85			Pout = 12 dBm
PAE @ PA output		21		%	Pout = 15 dBm
		14			Pout = 12 dBm
Harmonics		-43		dBm/MHz	Pout = 15 dBm
Power Detector Sensitivity		20		mV/dB	Pout = 6dBm
		100		mV/dB	Pout = 15dBm
Power Detector Output	50		800	mV	
PA Turn-On Time		125		nS	
WiFi Rx Path					
Insertion Loss (In-Band)		1.3		dB	
Isolation ANT/RX in WiFi TX mode		28		dB	

Table 4. Control Logic Truth Table

Mode	SW0	SW1	PAEN
RX	1	0	0
TX	0	1	1
FEM OFF	0	0	0

Evaluation Board Description

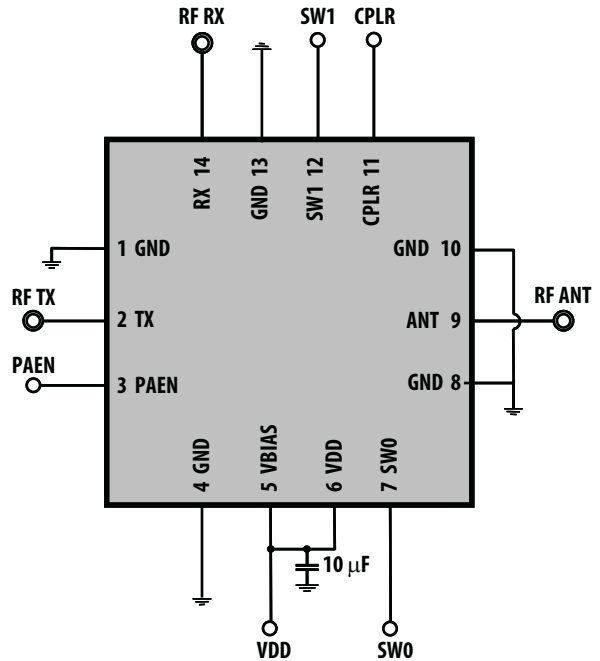
Table 5. Pin Description:

Top Pin No.	Function	Bottom Pin No.	Function
1	VDD	2	GND
3	VBIAS	4	GND
5	VREF	6	GND
7	PAEN	8	GND
9	SW0	10	GND
11	SW2	12	GND
13	SW1	14	GND

Table 6. Typical Test Conditions:

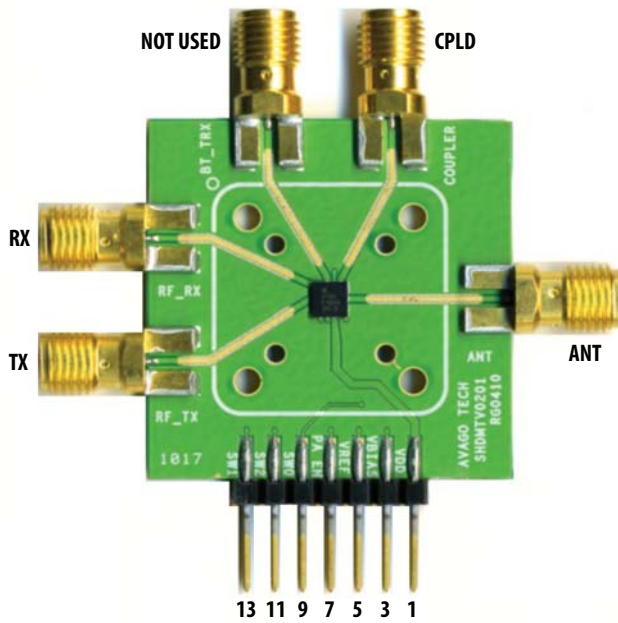
PIN	TX	RX	Description
VDD	3.3 V	3.3 V	Supply Voltage
VBIAS	3.3 V	3.3 V	Bias Supply
VREF	NA	NA	NOT USED
PAEN	2.9 V	0 V	PA Enable
SW0	0 V	2.9 V	Switch Control
SW2	2.9 V	0 V	Switch Control
SW1	NA	NA	NOT USED

Application Circuit

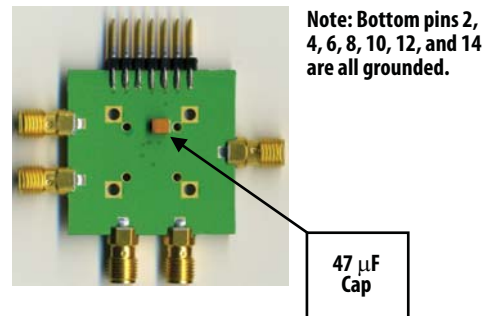


Note: Only one bypass cap on VDD is required

Demoboard Top Pins



Demoboard Bottom Pins



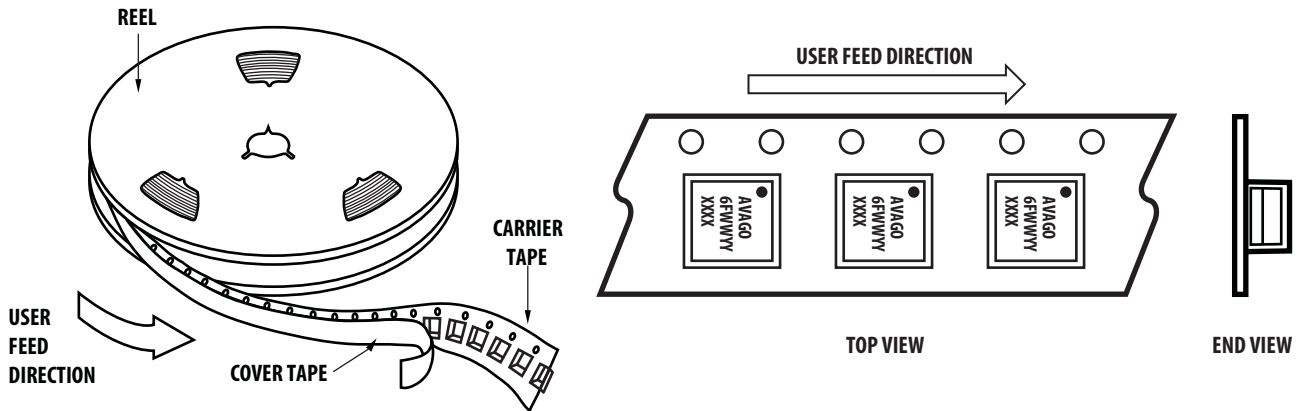
Marking Specification



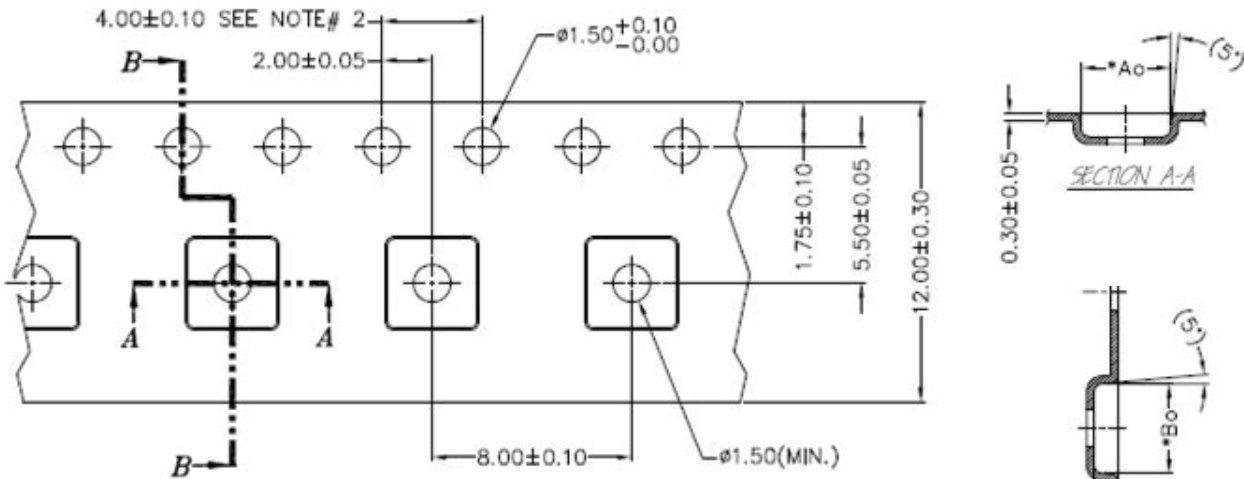
- "6" = Device Code
- "F" = Manufacturing code
- "WW" = Build of Work Week
- "YY" = Build of Year
- "XXXX" = Last 4 Digits of Assembly Lot Number

Note: Package marking provides Orientation and Identification

Device Orientation & Pin 1 Location In Tape



Tape Dimensions

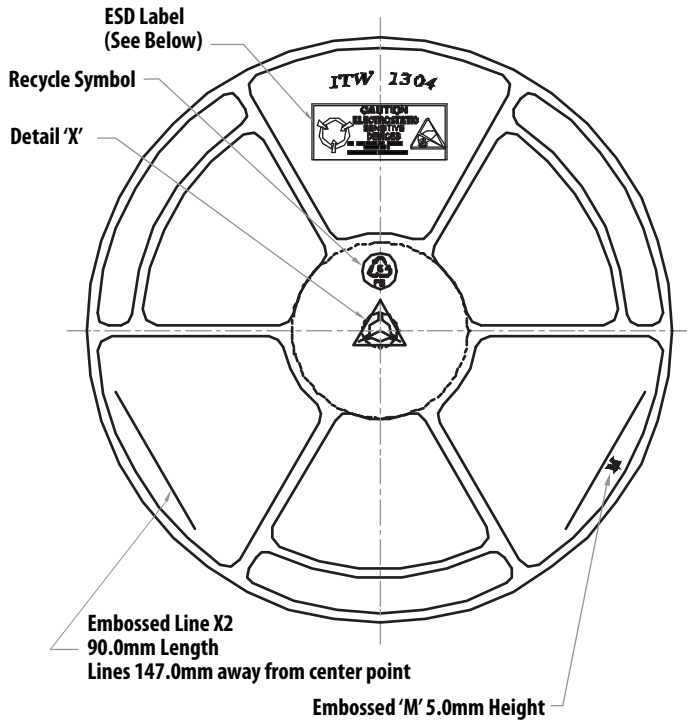


Notes:

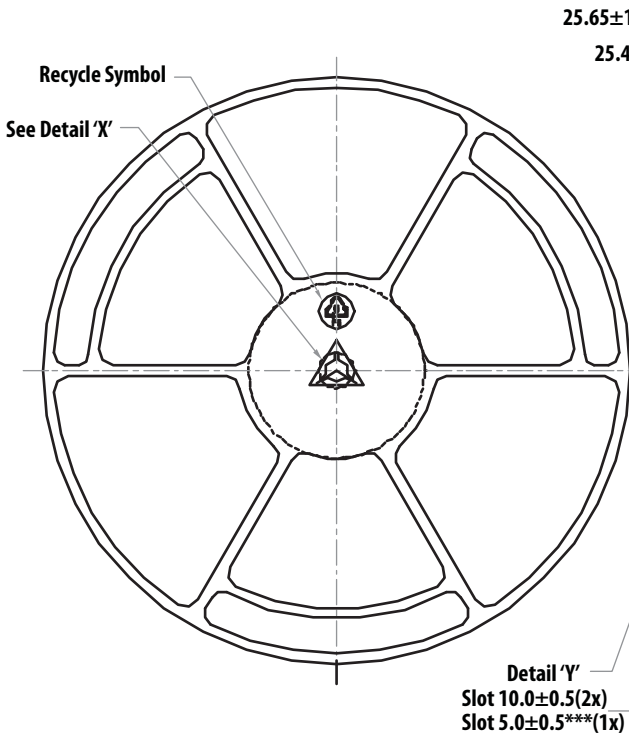
1. Ao & Bo measured at 0.3 mm above base of pocket.
2. 10 pitches cumulative tol. ± 0.2 mm.
3. () Reference dimensions only.

- Ao: 3.60
- Bo: 3.60
- Ko: 0.95
- Pitch: 8.00
- Width: 12.00

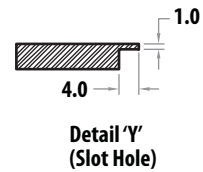
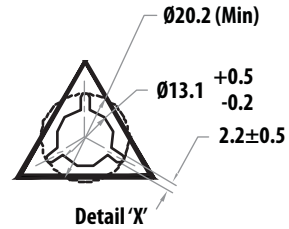
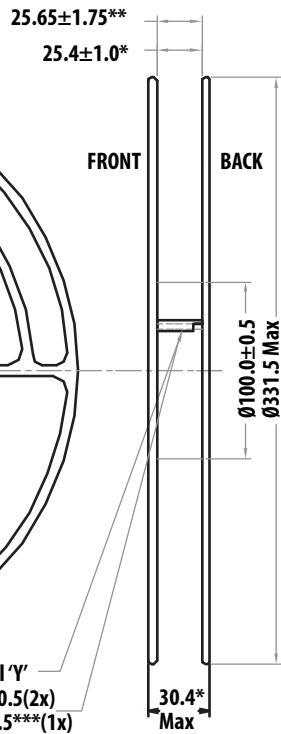
Reel Dimensions (13 inch)



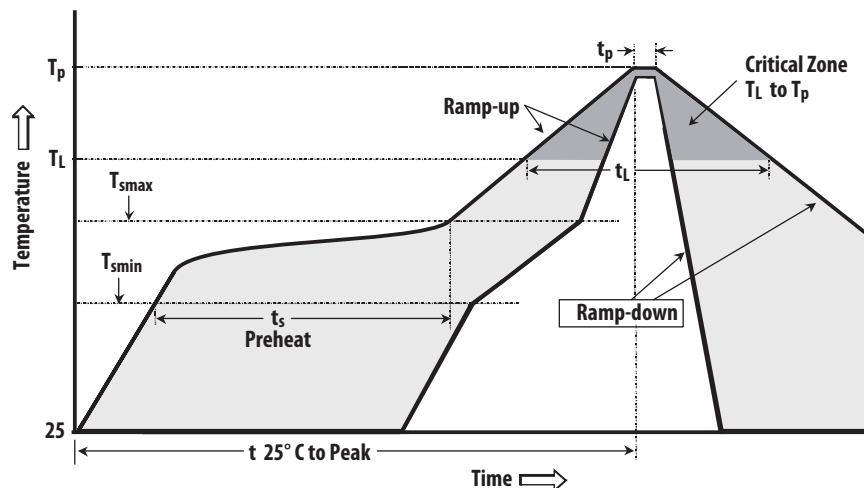
FRONT VIEW



BACK VIEW



Reflow Profile Recommendations



Typical SMT Reflow Profile for Maximum Temperature = $260 \pm 5^\circ\text{C}$

Profile Feature	Sn-Pb Solder	Pb-Free Solder
Average ramp-up rate (TL to TP)	3°C/sec max	3°C/sec max
Preheat		
– Temperature Min (T_{smin})	100° C	150° C
– Temperature Max (T_{smax})	150° C	200° C
– Time (min to max) (t_s)	60-120 sec	60-120 sec
T_{smax} to TL		
– Ramp-up Rate		3°C/sec max
Time maintained above:		
– Temperature (TL)	183° C	217° C
– Time (TL)	60-150 sec	60-150 sec
Peak temperature (T_p)	240 $\pm 5^\circ\text{C}$	260 $\pm 5^\circ\text{C}$
Time within 5° C of actual Peak Temperature (t_p)	10-30 sec	20-40 sec
Ramp-down Rate	6°C/sec max	6°C/sec max
Time 25° C to Peak Temperature	6 min max.	8 min max.

Ordering Information

Part Number	No. of Devices	Container
AFEM-S106-TR1G	3000	13" Reel
AFEM-S106-BLKG	100	Antistatic Bag

For product information and a complete list of distributors, please go to our web site: www.avagotech.com

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