

**Required additional info:**

Per FCC TCB request, please provide us the following information.

1. Shrinking tube enclosure: The shrinking tube if an RF shielding which is used to replace to shielded can as per FCC Modular Approval Requirement. Please find the data sheet below:
2. Please find the labeling instruction to OEM Manufacturer who employs your product in their system on Page 11 of the Revised Users Manual.
3. Compliance with Part 90.203(e) is stated on Page 7 of the Revised Users Manual.
4. Part 2.1033(c)(8): Please, provide the dc voltages applied to and dc currents for the final state amplifier specified in the SGA-6586 Data Sheet.

From VOSTEK ELECTRONICS  
RPO 60043, 1032 PAPE AVE  
TORONTO, ONT M4K 3Z3  
TEL. 416 423-0882  
Vasco B

**Here is the additional info required by TCB:**

1. Product Heat shrink tube used for our unit MX 3000 is made by ALPHA. Information are listed bellow:

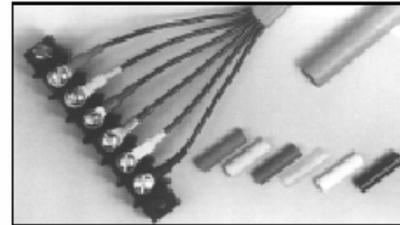
**FIT** Preferred Heat Shrink Products  
**GENERAL PURPOSE, IRRADIATED POLYOLEFIN**  
**FIT-221**

MIL-DTL-23053/5C,  
 CLASS 1, 2  
 UL STANDARD 224  
 CSA STANDARD 198

**CHOOSE FIT-221 FOR:**

- General Purpose Protection and Repair
- Identification and Beautifying Substrates
- Insulation from Environment
- Reduced Longitudinal Shrinkage
- Resistance to Water, Fungus, UV Light (black only)
- Use with XTRA•GUARD® 1

**2 TO 1** SHRINK RATIO



**FIT-221 APPLICATIONS:**

- General Purpose Insulation and Repair
- Wire and Cable Harnessing and Bundling
- Cable and Connector Protection
- Wire and Tubing Splicing and Connecting
- XTRA•GUARD® 1 Applications
- Automated Cutting Machines (spools)

**CHARACTERISTICS**

**OPERATING TEMPERATURE:**

- -55°C to 135°C

**SHRINKAGE RATIO:**

- Approximately 2 to 1 at 121°C

**COLOR DESCRIPTION:**

- 4-Foot Lengths:
  - 3/64 to 2 Inch – Black, White, Clear, Red, Yellow, Blue, Green
  - 3 and 4 Inch – Black, Clear
- 6-Inch Lengths:
  - 3/64 to 1 Inch – Black, White, Clear, Red, Yellow, Blue, Green
  - 1-1/2 to 3 Inch – Black, Clear
- 1/2 or 1 Inch Cut Pieces: Black
- Spools: See Color Availability Chart Next Page

**PHYSICAL PROPERTIES:**

- Tensile Strength: 1500 psi, (106 kg/cm<sup>2</sup>)
- Ultimate Elongation: 200%
- Longitudinal Shrinkage: -5%
- Specific Gravity: 1.35
- Secant Modulus: 2.5 x 10<sup>4</sup> max.
- Flammability: Self-Extinguishing

**CHEMICAL PROPERTIES:**

- Corrosive Effect: Passes Copper Stability Test
- Fungus Resistance: No Growth

**ELECTRICAL PROPERTIES:**

- Dielectric Strength: 500V/mil (197 kV/cm)
- Volume Resistivity: 10<sup>14</sup> ohm-cm

**SPECIFICATIONS**

- MIL-DTL-23053/5C, Class 1, 2
- UL Standard 224 (except for Clear)
- CSA Standard 198 (except for Clear)



Packaged Assortments		
Assorted Sizes of 6' Lengths		
Each Length - Size Identified		
Assorted Colors		
Alpha Part No.	Tubing Size Range	Lengths Per Box
<b>FIT-221-MS-1</b>	3/64" - 3/16"	6 per Size (5 Sizes) (30 Lengths)
<b>FIT-221-MS-2</b>	1/4" - 3/4"	4 per Size (4 Sizes) (16 Lengths)

**Recommended For Use With**  
**XTRA•GUARD® 1**  
**Extra-Premium Grade PVC Jacketed**  
**General Purpose Cables**



Toll Free: 1-800-52 ALPHA • Telephone: 908-925-8000 • Fax: 908-925-6923  
 Europe/UK Telephone: +44 (0) 1932 772422 • Europe/UK Fax: +44 (0) 1932 772433

Web Site: [www.alphawire.com](http://www.alphawire.com)  
 Email: [info@alphawire.com](mailto:info@alphawire.com)

### Electrical Properties:

- [Dielectric](#) Strength: 400V/mil (158 kV/cm)
- [Volume Resistivity](#) :  $10^{11}$  ohm-cm

### SPECIFICATIONS:

- MIL-I-23053/2C, Class 1\*
- UL Standard 224
- CSA Standard 198
- Passes UL [VW-1](#) Flame Test
- Passes CSA OFT Flame Test

Explanation:

#### Dielectric

"Any insulating material between two conductors, which permits electrostatic attraction and repulsion to take place across it."

#### Volume Resistivity

"The electrical resistance between opposite faces of a one cm. cube of insulating material, commonly expressed in ohms-centimeter."

#### CONTINUES:

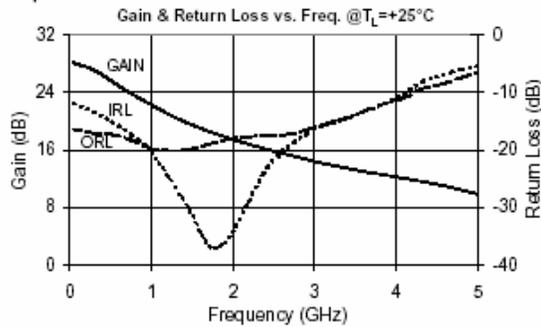
2. Revised user manual in PDF form sent to Ultratech labs.  
Required info can be find on **page 11** in revised manual for MX 3000 wireless audio/video transmitter 2.4 GHz- information about using a label for OEM manufacturers who using our module MX 3000.
3. Attestation showing compliance with this section, that the user cannot or does not have any control to change channels outside the authorized frequency band can be find in revised manual on **page 7**.
4. DC voltages applied to and DC currents into the several elements of the final radio frequency amplifying device for normal operation over the power range, as specify in this section are supplied. Also revised schematic diagram of the unit MX-3000 that contains same information provided as well.

Amplifier final stage in MX-3000 is using a state-of-the-art small signal amplifier made by Sirenza Microdevices model SGA 6586. The exciter stage is using a 5 V regulator on the board that guarantees normal operation of the unit and stable driving. Also an attenuator is supplied in between strip-line filters-combination of resistors R15, R16 and R17 that make an excellent low power driving to amplifier stage free of unwanted emissions. Resistor R18 controls bias of the final amplifier stage. Higher or lower supply voltage won't change the normal operation of the unit required by FCC rules.



## Product Description

Sirenza Microdevices' SGA-6586 is a high performance SiGe HBT MMIC Amplifier. A Darlington configuration featuring 1 micron emitters provides high  $F_T$  and excellent thermal performance. The heterojunction increases breakdown voltage and minimizes leakage current between junctions. Cancellation of emitter junction non-linearities results in higher suppression of intermodulation products. At 850 MHz and 60mA, the SGA-6586 typically provides +33.8 dBm output IP3, 23.8 dB of gain, and +21.5 dBm of 1dB compressed power using a single positive voltage supply. Only 2 DC-blocking capacitors, a bias resistor and an optional RF choke are required for operation.



## SGA-6586

### DC-4000 MHz, Cascadable SiGe HBT MMIC Amplifier



### Product Features

- High Gain : 18.4 dB at 1950 MHz
- Cascadable 50 Ohm
- Patented SiGe Technology
- Operates From Single Supply
- Low Thermal Resistance Package

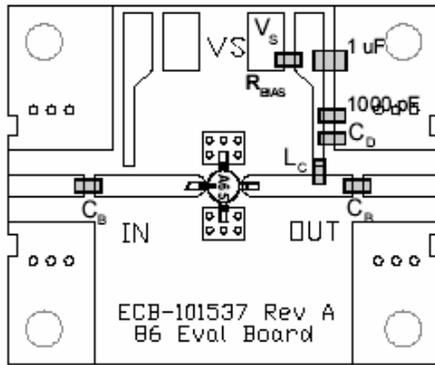
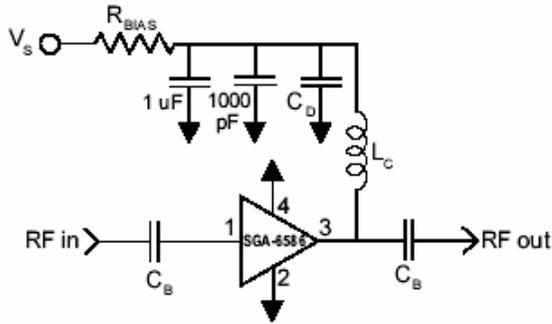
### Applications

- PA Driver Amplifier
- Cellular, PCS, GSM, UMTS
- IF Amplifier
- Wireless Data, Satellite

Symbol	Parameter	Units	Frequency	Min.	Typ.	Max.
G	Small Signal Gain	dB	850 MHz		23.8	
		dB	1950 MHz		18.4	
		dB	2400 MHz		16.7	
$P_{1dB}$	Output Power at 1dB Compression	dBm	850 MHz		21.5	
		dBm	1950 MHz		18.0	
OIP <sub>3</sub>	Output Third Order Intercept Point	dBm	850 MHz		33.8	
		dBm	1950 MHz		32.2	
Bandwidth	Determined by Return Loss (>10dB)	MHz			2500	
IRL	Input Return Loss	dB	1950 MHz		21.4	
ORL	Output Return Loss	dB	1950 MHz		18.0	
NF	Noise Figure	dB	1950 MHz		3.1	
$V_D$	Device Operating Voltage	V		4.6	5.0	5.4
$I_D$	Device Operating Current	mA		67	75	83
$R_{TH} \text{ } j-l$	Thermal Resistance (junction to lead)	$^\circ\text{C}/\text{W}$			97	
<b>Test Conditions:</b> $V_S = 8\text{ V}$ $I_D = 80\text{ mA Typ.}$ OIP <sub>3</sub> Tone Spacing = 1 MHz, Pout per tone = -5 dBm $R_{BIAS} = 39\text{ Ohms}$ $T_L = 25^\circ\text{C}$ $Z_S = Z_L = 50\text{ Ohms}$						

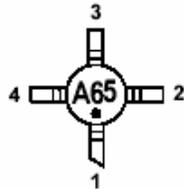
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## Basic Application Circuit



### Part Identification Marking

The part will be marked with an "A65" designator on the top surface of the package.



### Application Circuit Element Values

Reference Designator	Frequency (Mhz)				
	500	860	1950	2400	3500
C <sub>b</sub>	220 pF	100 pF	68 pF	56 pF	39 pF
C <sub>D</sub>	100 pF	68 pF	22 pF	22 pF	15 pF
L <sub>C</sub>	68 nH	33 nH	22 nH	18 nH	15 nH

### Recommended Bias Resistor Values for I<sub>D</sub>=80mA

$$R_{BIAS} = (V_s - V_D) / I_b$$

Supply Voltage(V <sub>s</sub> )	6 V	8 V	10 V	12 V
R <sub>BIAS</sub>	13 Ω	39 Ω	62 Ω	91 Ω

Note: R<sub>BIAS</sub> provides DC bias stability over temperature.

### Mounting Instructions

1. Use a large ground pad area under device pins 2 and 4 with many plated through-holes as shown.
2. We recommend 1 or 2 ounce copper. Measurements for this data sheet were made on a 31 mil thick FR-4 board with 1 ounce copper on both sides.

Pin #	Function	Description
1	RF IN	RF input pin. This pin requires the use of an external DC blocking capacitor chosen for the frequency of operation.
2, 4	GND	Connection to ground. For optimum RF performance, use via holes as close to ground leads as possible to reduce lead inductance.
3	RF OUT/BIAS	RF output and bias pin. DC voltage is present on this pin, therefore a DC blocking capacitor is necessary for proper operation.

Please do if you need any additional info do not hesitate to ask us, we will be more than happy to help.

Regards  
For Vostek electronics  
Vasco Bjelica RF eng. Designer