FUJITSU MEDIA DEVICE
DATA SHEET

DS04-21712-1E

ASSP for Mobile Telephone

VCO (800 to 2000 MHz)

VC-23 Series

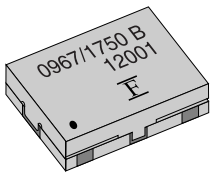
■ DESCRIPTION

With excellent C/N characteristics and low current consumption, this VCO series is suitable for use with AMPS, CDMA and PCS and is ideal to miniaturize dual-band mode products. The VC-23 series can be used in any frequency band in the 800 MHz to 2000 MHz range. The device utilizes FUJITSU MEDIA DEVICE's high-frequency design technology, high-density mounting technology, and frequency adjustment technology to provide a high level of reliability in addition to high performance and small size.

■ FEATURES

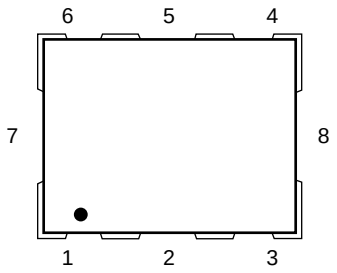
- Superior noise characteristics (C/N, S/N)
- Frequency switching type
- High level of stability in response to ambient temperature and load variations
- FUJITSU MEDIA DEVICE's proprietary fabrication process provides a uniform central frequency distribution
- Small size, light-weight, slim-package : 9.3 × 7.3 × 2.0 mm (Max.)
- SMD-type taping specifications suitable for automatic mounting and reflow soldering

■ PACKAGE



■ PIN ASSIGNMENT

(TOP VIEW)



■ PIN DESCRIPTION

Pin No.	Symbol	Description
1	Vt	Control voltage
2	GND	GND
3	V_{CC}	Power supply voltage
4	OUT	Output
5	GND	GND
6	V_{SW}	Band select
7	GND	GND
8	GND	GND

■ PRODUCT LINEUP (STANDARD MODELS)

System	Center Frequency (MHz)	Band Width (MHz)	Power Supply Voltage (V)	Part Number
AMPS•CDMA/PCS	967	±13	3.0 ± 0.15	VC-3R0A23-0967/ 1750B
	1750	±30		

■ ELECTRICAL CHARACTERISTICS

• **Absolute Maximum Ratings**

Parameter	Symbol	Rating		Unit
		Min.	Max.	
Input DC voltage	V_{CC}	–0.6	+6.0	V
Control voltage	Vt	–0.6	+6.0	V
SW voltage	V_{SW}	–0.6	+6.0	V
Operating temperature	Ta	–30	+80	°C
Storage temperature	Tstg	–30	+85	°C
Storage humidity	Hstg	5	95	%

WARNING: VCO can be permanently damaged by application of stress (voltage, temperature, humidity, etc.) in excess of absolute maximum ratings. Do not exceed these ratings.

• **Band Selection Mode**

Band Width	Selection Mode	V_{SW} (V)		Center Frequency (MHz)	Current Consumption (mA) Typ.
		Min.	Max.		
CDMA	Band1	0.0	0.15	967	0.0
PCS	Band2	2.85	3.0	1750	0.4

• **Electrical Charasteristics**

Band1

(Ta = –30°C to +80°C)

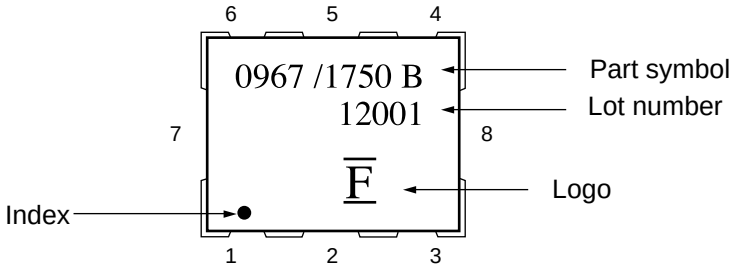
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Current consumption	I_{CC}	V_{CC} = 3.0 V, Vt = 1.5 V	—	—	10.0	mA
SW current	I_{SW}	V_{CC} = 3.0 V, Vt = 1.5 V	—	0.4	0.7	mA
Frequency	fmin	V_{CC} = 3.0 V, Vt = 0.3 V	—	—	954.0	MHz
Frequency	fmax	V_{CC} = 3.0 V, Vt = 2.7 V	980.0	—	—	MHz
Control voltage sensitivity	Svt	(fmax – fmin) / 2.4	18.0	—	30.0	MHz/V
Oscillator output	P_O	V_{CC} = 3.0 V, Vt = 1.5 V	–5.0	—	1.0	dBm
C/N	C/N	V_{CC} = 3.0 V, Vt = 1.5 V, Offset = 0.3 kHz , BW = 1 Hz	—	—	–60.0	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.5 V, Offset = 1 kHz , BW = 1 Hz	—	—	–70.0	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.5 V, Offset = 10 kHz , BW = 1 Hz	—	—	–100.0	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.5 V, Offset = 30 kHz , BW = 1 Hz	—	—	–110.0	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.5 V, Offset = 60 kHz , BW = 1 Hz	—	—	–119.0	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.5 V , BW = 1 Hz Offset = 60 kHz (Ta = 25°C)	—	—	–120.0	dBc/Hz
Higher harmonics	H_S	V_{CC} = 3.0 V, Vt = 1.5 V, Up to 3rd	—	—	–10.0	dBc
Spurious	S_P	V_{CC} = 3.0 V, Vt = 1.5 V	—	—	–80.0	dBc
Power supply variation	Push	V_{CC} = 3.0 V ± 0.15 V, Vt = 1.5 V	—	—	±1000	kHz
Load variation	Pull	V_{CC} = 3.0 V , Vt = 1.5 V, VSWR = 2, All phases	—	—	±1000	kHz
Temperature drift	Td	Ta = +25°C ± 55°C	—	—	±3000	kHz

Band2

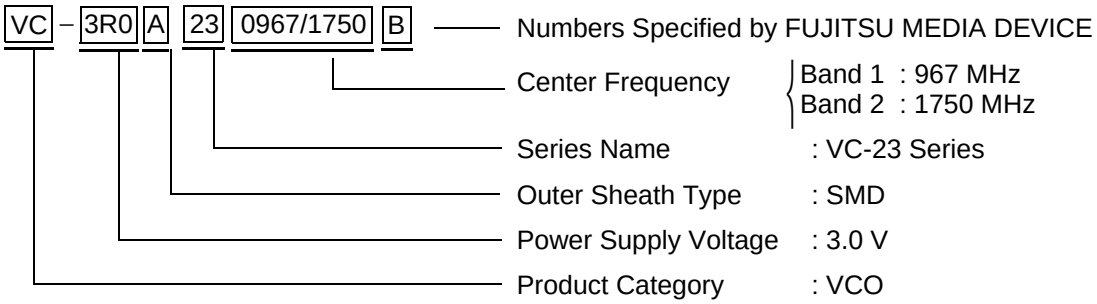
(Ta = –30°C to +80°C)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Current consumption	I_{CC}	V_{CC} = 3.0 V, Vt = 1.5 V	—	—	10.0	mA
SW current	I_{SW}	V_{CC} = 3.0 V, Vt = 1.5 V	—	0.4	0.7	mA
Frequency	fmin	V_{CC} = 3.0 V, Vt = 0.3 V	—	—	1720.0	MHz
Frequency	fmax	V_{CC} = 3.0 V, Vt = 2.7 V	1780.0	—	—	MHz
Control voltage sensitivity	Svt	(fmax – fmin) / 2.4	30.0	—	50.0	MHz/V
Oscillator output	P_O	V_{CC} = 3.0 V, Vt = 1.5 V	–5.0	—	1.0	dBm
C/N	C/N	V_{CC} = 3.0 V, Vt = 1.5 V, Offset = 0.3 kHz , BW = 1 Hz	—	—	–60.0	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.5 V, Offset = 1 kHz , BW = 1 Hz	—	—	–70.0	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.5 V, Offset = 10 kHz , BW = 1 Hz	—	—	–90.0	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.5 V, Offset = 100 kHz , BW = 1 Hz	—	—	–115.0	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.5 V, Offset = 625 kHz , BW = 1 Hz	—	—	–130.0	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.5 V, Offset = 1250 kHz , BW = 1 Hz	—	—	–138.0	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.5 V , BW = 1 Hz Offset = 1250 kHz (Ta = 25°C)	—	—	–139.0	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.5 V, Offset > 2000 kHz , BW = 1 Hz	—	—	–141.0	dBc/Hz
Higher harmonics	P_S	V_{CC} = 3.0 V, Vt = 1.5 V, Up to 3rd	—	—	–10.0	dBc
Spurious	S_P	V_{CC} = 3.0 V, Vt = 1.5 V	—	—	–80.0	dBc
Power supply variation	Push	V_{CC} = 3.0 V ± 0.15 V, Vt = 1.5 V	—	—	±1000	kHz
Load variation	Pull	V_{CC} = 3.0 V , Vt = 1.5 V, VSWR = 2, All phases	—	—	±1000	kHz
Temperature drift	Td	Ta = +25°C ± 55°C	—	—	±3000	kHz

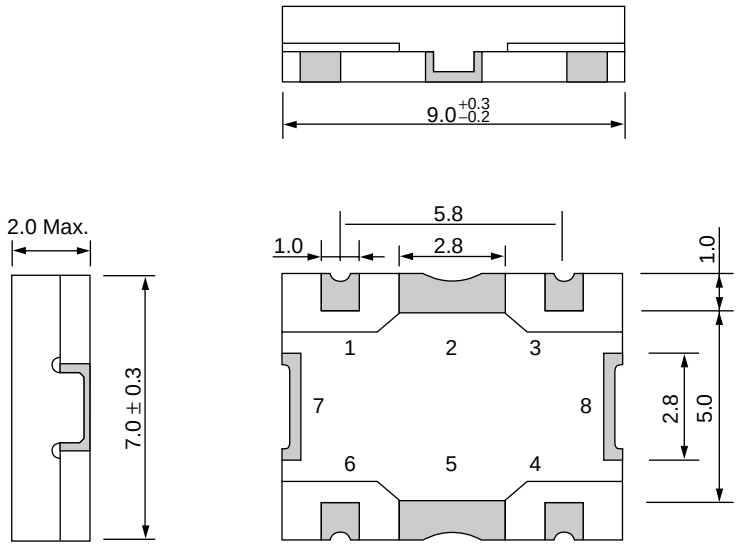
■ MARKING



■ PART NUMBER DESIGNATION

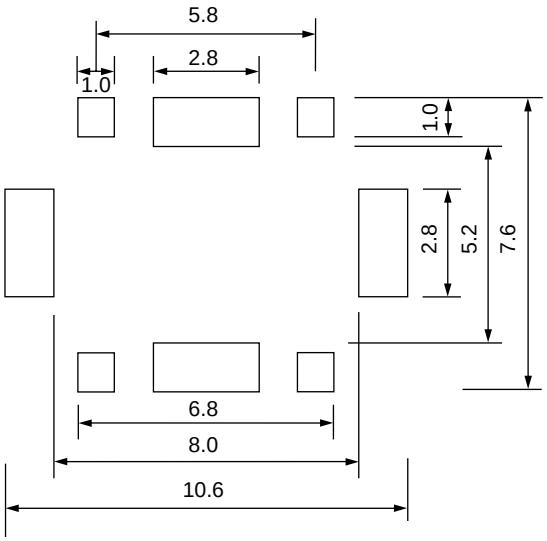


■ PACKAGE DIMENSION



Dimensions in mm

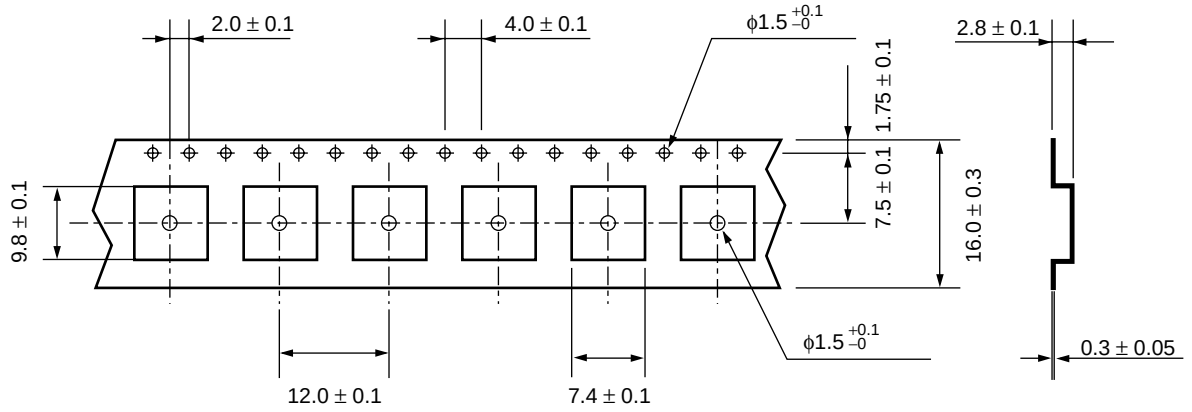
■ RECOMMENDED PATTERN FOR SOLDERING



Dimensions in mm
Dimension tolerance : ± 0.1 mm

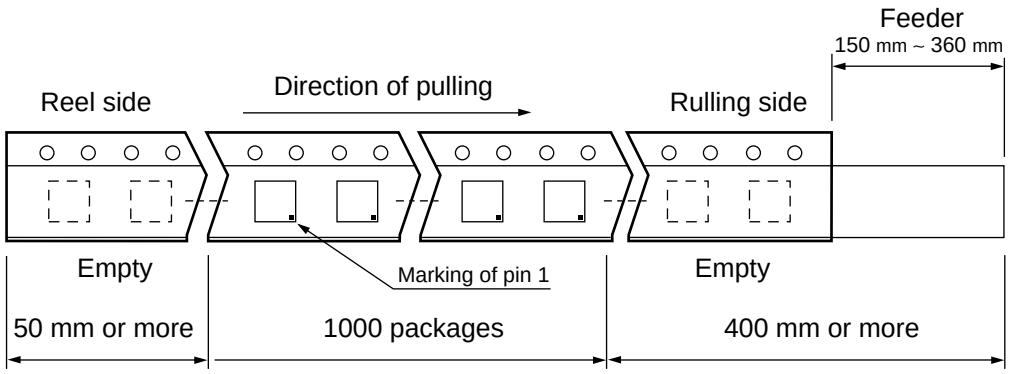
■ TAPING AND PACKAGING

(1) Carrier Tape and Packaging

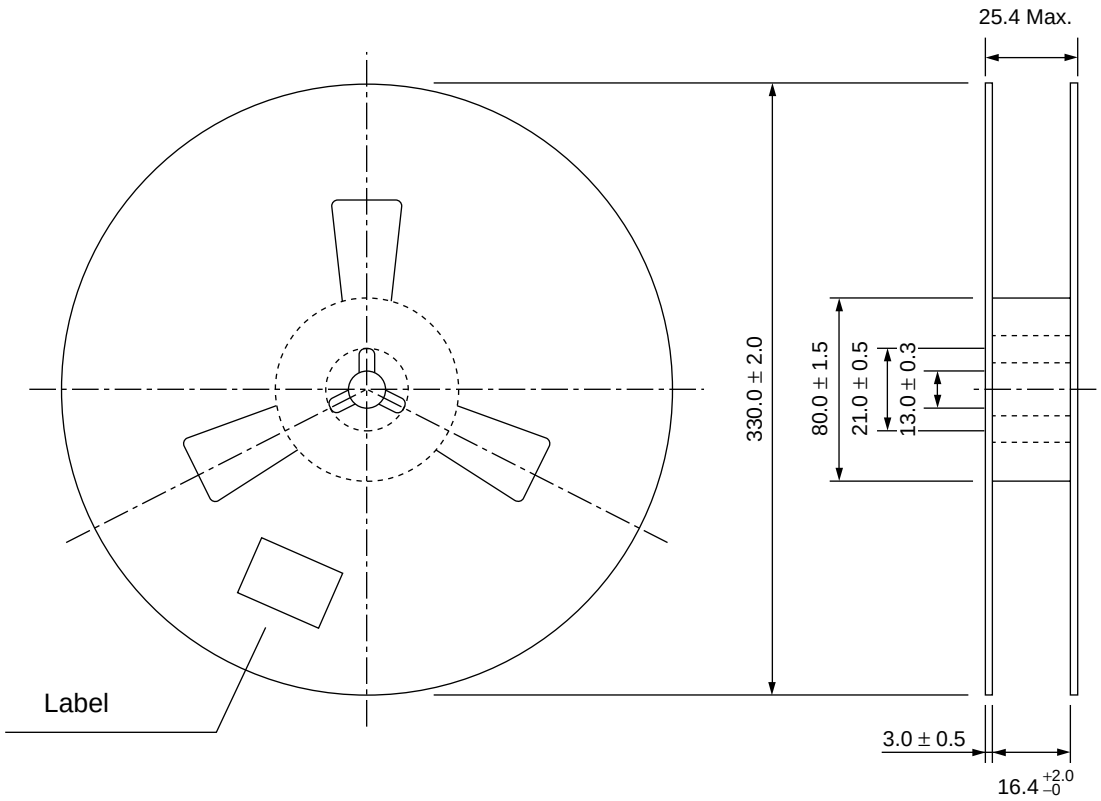


Dimensions in mm

(2) Taping Layout



(3) Reel Shape and Dimensions



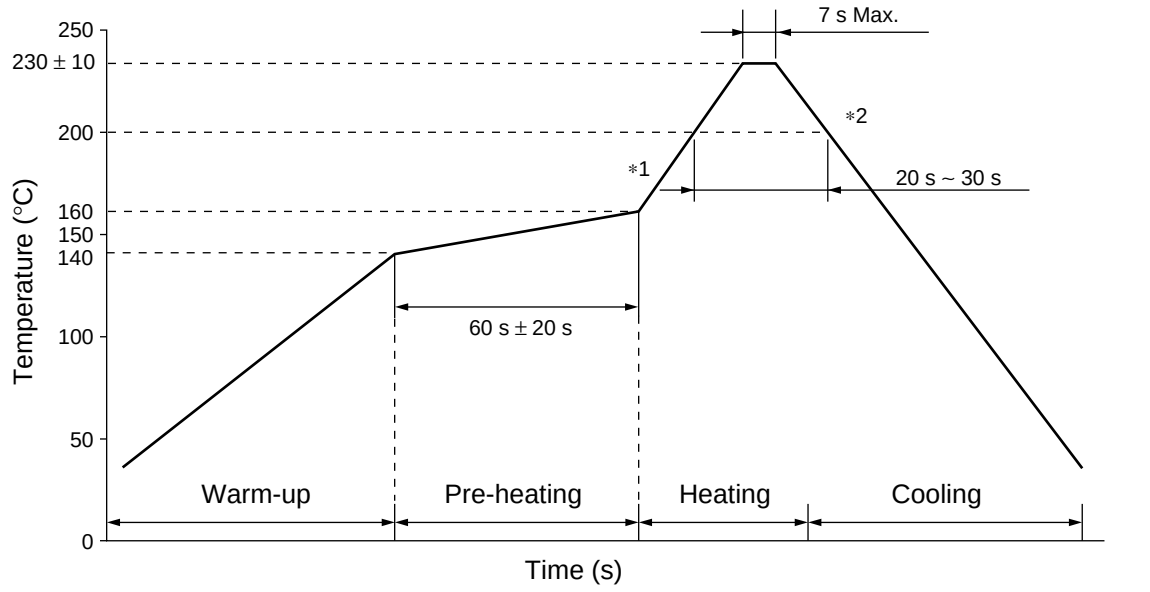
Note : The label specifies the part number, quantity, and lot number.

Volume : 1000 pcs/reel
Type : (L) 340 × (W) 340 × (t) 30 (mm)

Dimensions in mm

■ REFLOW MOUNTING CONDITIONS (RECOMMENDED)

- Perform mounting using the temperature profile shown below. To prevent thermal stress to the VCO, ensure gentle temperature gradients and use preheating whenever possible. (Recommended preheating: 140°C to 160°C for 60 s ± 20 s)
- Always consult FUJITSU MEDIA DEVICE beforehand if mounting more than once.
- Never remove a VCO that has already been mounted and attempt to reuse.
- For mounting, use a general-purpose flux suitable for mounting electronic components.



∗1 : 10°C/s or less
∗2 : 8 °C/s or less

■ WASHING CONDITIONS

- Washing solution: Use isopropyl alcohol.
- Washing procedure: Immersion or steam cleaning is recommended.
- Washing time: For immersion: Less than 5 minutes at 40°C or less.
  For steam: Less than 2 minutes at 90°C or less is recommended.

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