FUJITSU MEDIA DEVICE
DATA SHEET

DS04-21716-1E

ASSP for Mobile Telephone

VCO (230 to 2300 MHz)

VC-50 Series

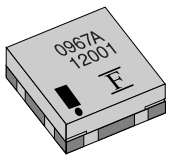
■ DESCRIPTION

With excellent C/N characteristics and low current consumption, this VCO series is ideal for CDMA, PCS, PHS and GSM mobile communication equipment. The VC-50 series can be used in any frequency band in the 230MHz to 2300MHz 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.

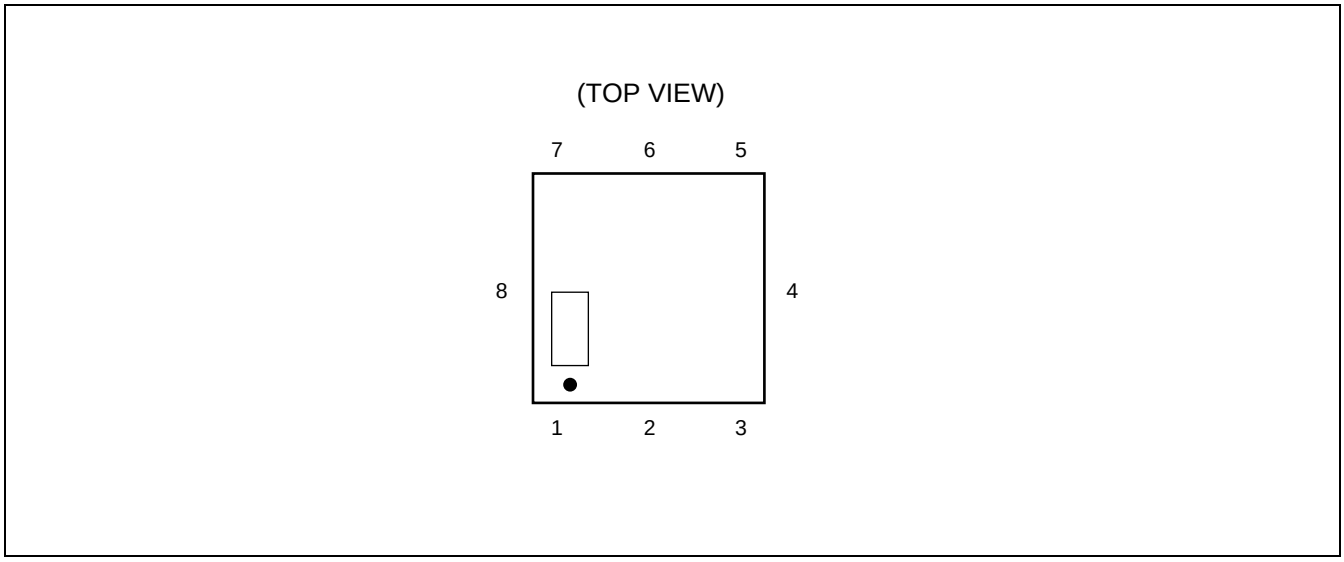
■ FEATURES

- Superior noise characteristics (C/N, S/N)
- High level of stability in response to ambient temperature and load variations
- FUJITSU MEDIA DEVICE's proprietary fabrication process provides the uniformity of the central frequency distribution
- Small size, light-weight, slim-package : 6.0 × 6.0 × 1.8 mm (Typ.)
- SMD-type taping specifications suitable for automatic mounting and reflow soldering

■ PACKAGE



■ PIN ASSIGNMENT



■ PIN DESCRIPTION

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

■ PRODUCT LINEUP (STANDARD MODELS)

System	Center Frequency (MHz)	Band Width (MHz)	Power Supply Voltage (V)	Part Number
CDMA	967	±13	3.0 ± 0.25	VC-3R0A50-0967A
	991	±13	2.5 ± 0.15	VC-2R5A50-0991
	1035	±15.5	2.55 ± 0.15	VC-2R5A50-1035
PCS	1750	±30	3.0 ± 0.16	VC-3R0A50-1750
K-PCS	1635	±15	2.7 ± 0.15	VC-2R7A50-1635
		±15	3.0 ± 0.15	VC-3R0A50-1635S
GSM	897	±17.5	2.8 ± 0.1	VC-2R8A50-0897F
	1171	±35	2.8 ± 0.07	VC-2R8A50-1171
GSM/DCS	1360	±80	2.85 ± 0.15	VC-2R8A50-1360
PHS	1652	±20	2.7 ± 0.1	VC-2R7A50-1652
	1668	±18.3	3.0 ± 0.2	VC-3R0A50-1668N

■ ELECTRICAL CHARACTERISTICS

1. For CDMA (Part number : VC-3RA50-0967A)

• **Absolute Maximum Ratings**

Parameter	Symbol	Rating		Unit
		Min.	Max.	
Input DC voltage	V_{CC}	—	+3.25	V
Control voltage	Vt	—	+3.25	V
Operating temperature	Ta	–30	+80	°C
Storage temperature	Tstg	–40	+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.

• **Electrical Characteristics**

(Ta = +25°C ± 3°C)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Current consumption	I_{CC}	V_{CC} = 3.0 V, Vt = 1.7 V	—	—	6.4*	mA
Frequency	fmin	V_{CC} = 3.0 V, Vt = 0.7 V	—	—	954.0*	MHz
Frequency	fmax	V_{CC} = 3.0 V, Vt = 2.7 V	980.0*	—	—	MHz
Control voltage sensitivity	kv	(fmax – fmin) /2.0	18.0	23.0	28.0	MHz/V
Oscillator output	Po	V_{CC} = 3.0 V, Vt = 1.7 V	–6.0*	—	1.0*	dBm
C/N	C/N	V_{CC} = 3.0 V, Vt = 1.7 V, Offset = 1 kHz, BW = 1 Hz	70.0*	—	—	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.7 V, Offset = 10 kHz, BW = 1 Hz	100.0*	—	—	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.7 V, Offset = 30 kHz, BW = 1 Hz	110.0*	—	—	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.7 V, Offset = 60 kHz, BW = 1 Hz	115.0*	—	—	dBc/Hz
Higher harmonics	Hs	V_{CC} = 3.0 V, Vt = 1.7 V, 2nd, 3rd	—	—	–10.0*	dBc
Spurious	S_P	V_{CC} = 3.0 V, Vt = 1.7 V	—	—	–70.0*	dBc
Power supply variation	Push	V_{CC} = 3.0 V ± 0.25 V, Vt = 1.7 V	—	—	±800*	kHz
Load variation	Pull	V_{CC} = 3.0 V, Vt = 1.7 V, VSWR = 2 ALL PHASE	—	—	±1000	kHz
Temperature drift	Td	Ta = +25 °C ± 55 °C	—	—	±3000*	kHz

* : Ta = –30°C to +80°C

2. For CDMA (Part number : VC-2R5A50-0991)

• **Absolute Maximum Ratings**

Parameter	Symbol	Rating		Unit
		Min.	Max.	
Input DC voltage	V_{CC}	—	+6.0	V
Control voltage	Vt	—	+10.0	V
Operating temperature	Ta	–40	+85	°C
Storage temperature	Tstg	–50	+125	°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.

• Electrical Characteristics

(Ta = –40°C to +85°C)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Current consumption	I_{CC}	V_{CC} = 2.5 V , Vt = 1.4 V	—	—	8.0 7.0*	mA
Frequency	fmin	V_{CC} = 2.5 V, Vt = 0.6 V	—	—	978.0	MHz
Frequency	fmax	V_{CC} = 2.5 V, Vt = 2.2 V	1004.0	—	—	MHz
Control voltage sensitivity	kv	(fmax – fmin) /1.6	23.0	27.0	31.0	MHz/V
Oscillator output	Po	V_{CC} = 2.5 V, Vt = 1.4 V	–4.5	–1.5	1.5	dBm
C/N	C/N	V_{CC} = 2.5 V, Vt = 1.4 V, Offset = 20 kHz, BW = 1 Hz	107.0 108.0*	—	—	dBc/Hz
		V_{CC} = 2.5 V, Vt = 1.4 V, Offset = 25 kHz, BW = 1 Hz	110.0 111.0*	—	—	dBc/Hz
		V_{CC} = 2.5 V, Vt = 1.4 V, Offset = 60 kHz, BW = 1 Hz	118.0	—	—	dBc/Hz
		V_{CC} = 2.5 V, Vt = 1.4 V, Offset = 900 kHz, BW = 1 Hz	140.0	—	—	dBc/Hz
Higher harmonics	Hs	V_{CC} = 2.5 V, Vt = 1.4 V, Up to 3rd	—	—	–15.0	dBc
Spurious	S_P	V_{CC} = 2.5 V, Vt = 1.4 V, Up to 3 GHz	—	—	–70.0	dBc
Power supply variation	Push	V_{CC} = 2.5 V ± 0.15 V, Vt = 1.4 V	—	—	±500	kHz
Load variation	Pull	V_{CC} = 2.5 V, Vt = 1.4 V, VSWR = 2 ALL PHASE	—	—	±500	kHz

* : Ta = +25 °C ± 3°C

3. For CDMA (Part number : VC-2R5A50-1035)

• **Absolute Maximum Ratings**

Parameter	Symbol	Rating		Unit
		Min.	Max.	
Input DC voltage	V_{CC}	—	+6.0	V
Control voltage	Vt	—	+10.0	V
Operating temperature	Ta	–40	+85	°C
Storage temperature	Tstg	–50	+125	°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.

• **Electrical Characteristics**

(Ta = –40°C to +85°C)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Current consumption	I_{CC}	V_{CC} = 2.55 V, Vt = 1.35 V	—	—	10.0	mA
Frequency	fmin	V_{CC} = 2.55 V, Vt = 0.5 V	—	—	1019.0	MHz
Frequency	fmax	V_{CC} = 2.55 V, Vt = 2.2 V	1050.0	—	—	MHz
Control voltage sensitivity	kv	(fmax – fmin) /1.7, Vt = 1.35 V	24.0	28.0	32.0	MHz/V
Oscillator output	Po	V_{CC} = 2.55 V, Vt = 1.35 V	–3.0	0.0	3.0	dBm
C/N	C/N	V_{CC} = 2.55 V, Vt = 1.35 V, Offset = 625 kHz , BW = 1 Hz	137.0	—	—	dBc/Hz
		V_{CC} = 2.55 V, Vt = 1.35 V, Offset = 1.25 MHz , BW = 1 Hz	143.0	—	—	dBc/Hz
Higher harmonics	Hs	V_{CC} = 2.55 V, Vt = 1.35 V, 2nd, 3rd, 4th	—	—	–15.0	dBc
Spurious	S_P	V_{CC} = 2.55 V, Vt = 1.35 V, Up to 3 GHz	—	—	–70.0	dBc
Power supply variation	Push	V_{CC} = 2.55 V ± 0.15 V, Vt = 1.35 V	—	—	±500	kHz
Load variation	Pull	V_{CC} = 2.55 V, Vt = 1.35 V, VSWR = 2 ALL PHASE	—	—	±500	kHz

4. For PCS (Part number : VC-3R0A50-1750)

• **Absolute Maximum Ratings**

Parameter	Symbol	Rating		Unit
		Min.	Max.	
Input DC voltage	V_{CC}	—	+3.2	V
Control voltage	Vt	—	+3.2	V
Operating temperature	Ta	–30	+80	°C
Storage temperature	Tstg	–35	+85	°C
Storage humidity	Hstg	5	95	%

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• **Electrical Characteristics**

(Ta = –30°C to +80°C)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Current consumption	I_{CC}	V_{CC} = 3.0 V, Vt = 1.65 V	—	—	8.5	mA
Frequency	fmin	V_{CC} = 3.0 V, Vt = 0.3 V	—	—	1720.0	MHz
Frequency	fmax	V_{CC} = 3.0 V, Vt = 3.0 V	1780.0	—	—	MHz
Control voltage sensitivity	kv	(fmax – fmin) /2.7	30.0	40.0	50.0	MHz/V
Oscillator output	Po	V_{CC} = 3.0 V, Vt = 1.65 V	–3.0	0.0	3.0	dBm
C/N	C/N	V_{CC} = 3.0 V, Vt = 1.65 V, Offset = 100 kHz , BW = 1 Hz	112.0	—	—	dBc/Hz
Higher harmonics	Hs	V_{CC} = 3.0 V, Vt = 1.65 V, Up to 3rd	—	—	–10.0	dBc
Spurious	S_P	V_{CC} = 3.0 V, Vt = 1.65 V	—	—	–80.0	dBc
Power supply variation	Push	V_{CC} = 3.0 V ± 0.16 V, Vt = 1.65 V	—	—	±600	kHz
Load variation	Pull	V_{CC} = 3.0 V, Vt = 1.65 V, VSWR = 2 ALL PHASE	—	—	±1200	kHz
Temperature drift	Td	Ta = +25 °C ± 55 °C	—	—	±6000	kHz

5. For K-PCS (Part number : VC-2R7A50-1635)

• **Absolute Maximum Ratings**

Parameter	Symbol	Rating		Unit
		Min.	Max.	
Input DC voltage	V_{CC}	—	+3.0	V
Operating temperature	Ta	–30	+80	°C
Storage temperature	Tstg	–40	+90	°C
Storage humidity	Hstg	5	95	%

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• Electrical Characteristics

(Ta = +25°C ± 3°C)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Current consumption	I_{CC}	V_{CC} = 2.7 V, Vt = 0.5 V to 2.5 V	—	—	8.5*	mA
Frequency	fmin	V_{CC} = 2.7 V, Vt = 0.5 V	—	—	1620.0*	MHz
Frequency	fmax	V_{CC} = 2.7 V, Vt = 2.5 V	1650.0*	—	—	MHz
Control voltage sensitivity	kv	(fmax – fmin) /2.0	22.0	—	—	MHz/V
Oscillator output	Po	V_{CC} = 2.7 V, Vt = 1.5 V	–3.0	—	—	dBm
C/N	C/N	V_{CC} = 2.7 V, Vt = 1.5 V, Offset = 1 kHz, BW = 1 Hz	70.0	—	—	dBc/Hz
		V_{CC} = 2.7 V, Vt = 1.5 V, Offset = 100 kHz, BW = 1 Hz	111.0	—	—	dBc/Hz
		V_{CC} = 2.7 V, Vt = 1.5 V, Offset = 1.25 MHz, BW = 1 Hz	134.0	—	—	dBc/Hz
Higher harmonics	Hs	V_{CC} = 2.7 V, Vt = 1.5 V, 2nd, 3rd	—	—	–10.0	dBc
Power supply variation	Push	V_{CC} = 2.7 V ± 0.15 V, Vt = 1.5 V	—	—	±800	kHz
Load variation	Pull	V_{CC} = 2.7 V, Vt = 1.5 V, VSWR = 2 ALL PHASE	—	—	±1500	kHz

* : Ta = –30°C to +80°C

6. For K-PCS (Part number : VC-3R0A50-1635S)

• **Absolute Maximum Ratings**

Parameter	Symbol	Rating		Unit
		Min.	Max.	
Input DC voltage	V_{CC}	—	+6.0	V
Control voltage	Vt	—	+6.0	V
Operating temperature	Ta	–30	+80	°C
Storage temperature	Tstg	–40	+90	°C
Storage humidity	Hstg	5	95	%

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• Electrical Characteristics

(Ta = +25°C ± 3°C)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Current consumption	I_{CC}	V_{CC} = 3.0 V, Vt = 1.5 V	—	—	8.5	mA
Frequency	fmin	V_{CC} = 3.0 V, Vt = 0.5 V	—	—	1620.0	MHz
Frequency	fmax	V_{CC} = 3.0 V, Vt = 2.5 V	1650.0	—	—	MHz
Control voltage sensitivity	kv	(fmax – fmin) /2.0	22.0	—	—	MHz/V
Oscillator output	Po	V_{CC} = 3.0 V, Vt = 1.5 V	–3.0	—	—	dBm
C/N	C/N	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 = 100 kHz, BW = 1 Hz	111.0*	—	—	dBc/Hz
		V_{CC} = 3.0 V, Vt = 1.5 V, Offset = 1.25 MHz, BW = 1 Hz	134.0*	—	—	dBc/Hz
Higher harmonics	Hs	V_{CC} = 3.0 V, Vt = 1.5 V, 2nd, 3rd	—	—	–10.0	dBc
Spurious	S_P	V_{CC} = 3.0 V, Vt = 1.5 V	—	—	–70.0*	dBc
Power supply variation	Push	V_{CC} = 3.0 V ± 0.15 V, Vt = 1.5 V	—	—	±500	kHz
Load variation	Pull	V_{CC} = 3.0 V, Vt = 1.5 V, VSWR = 2 ALL PHASE	—	—	±1000	kHz
Temperature drift	Td	Ta = +25 °C ± 55 °C	—	—	±3000*	kHz

* : Ta = –30°C to +80°C

7. For GSM (Part number : VC-2R8A50-0897F)

• **Absolute Maximum Ratings**

Parameter	Symbol	Rating		Unit
		Min.	Max.	
Input DC voltage	V_{CC}	—	+4.0	V
Control voltage	Vt	0	+2.9	V
Operating temperature	Ta	–20	+75	°C
Storage temperature	Tstg	–40	+85	°C
Storage humidity	Hstg	5	95	%

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• Electrical Characteristics

(Ta = +25°C ± 3°C)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Current consumption	I_{CC}	V_{CC} = 2.8 V, Vt = 1.2 V	—	—	25.0*	mA
Frequency	fmin	V_{CC} = 2.8 V, Vt = 0.5 V	—	—	880.0*	MHz
Frequency	fmax	V_{CC} = 2.8 V, Vt = 1.9 V	915.0*	—	—	MHz
Control voltage sensitivity	kv	(fmax – fmin) /1.4	24.0	—	36.0	MHz/V
Oscillator output	Po	V_{CC} = 2.8 V, Vt = 1.2 V	2.0	—	—	dBm
C/N	C/N	V_{CC} = 2.8 V, Vt = 1.2 V, Offset = 100 kHz, BW = 1 Hz	100.0	—	—	dBc/Hz
		V_{CC} = 2.8 V, Vt = 1.2 V, Offset = 400 kHz, BW = 1 Hz	125.0	—	—	dBc/Hz
		V_{CC} = 2.8 V, Vt = 1.2 V, Offset = 20 MHz, BW = 1 Hz	165.0	—	—	dBc/Hz
Higher harmonics	Hs	V_{CC} = 2.8 V, Vt = 1.2 V, 2nd, 3rd	—	—	–15.0	dBc
Power supply variation	Push	V_{CC} = 2.8 V ± 0.1 V, Vt = 1.2 V	—	—	±1000	kHz
Load variation	Pull	V_{CC} = 2.8 V, Vt = 1.2 V, VSWR = 2 ALL PHASE	—	—	±2000	kHz
Temperature drift	Td	Ta = +25 (+50/–45) °C	—	—	±2000*	kHz

* : Ta = –20°C to +75°C

8. For GSM (Part number : VC-2R8A50-1171)

• **Absolute Maximum Ratings**

Parameter	Symbol	Rating		Unit
		Min.	Max.	
Input DC voltage	V_{CC}	–0.3	+2.9	V
Control voltage	Vt	0	+2.9	V
Operating temperature	Ta	–20	+75	°C
Storage temperature	Tstg	–30	+85	°C
Storage humidity	Hstg	5	95	%

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• Electrical Characteristics

(Ta = +25°C ± 3°C)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Current consumption	I_{CC}	V_{CC} = 2.8 V, Vt = 1.425 V	—	—	8.0*	mA
Frequency	fmin	V_{CC} = 2.8 V, Vt = 0.85 V	—	—	1136.0*	MHz
Frequency	fmax	V_{CC} = 2.8 V, Vt = 2.0 V	1206.0*	—	—	MHz
Control voltage sensitivity	kv	(fmax – fmin) /1.15	70.0*	—	90.0*	MHz/V
Oscillator output	Po	V_{CC} = 2.8 V, Vt = 1.425 V	–5.0*	—	+1.0*	dBm
C/N	C/N	V_{CC} = 2.8 V, Vt = 1.425 V, Offset = 10 kHz, BW = 1 Hz	85.0*	—	—	dBc/Hz
		V_{CC} = 2.8 V, Vt = 1.425 V, Offset = 400 kHz, BW = 1 Hz	117.0*	—	—	dBc/Hz
		V_{CC} = 2.8 V, Vt = 1.425 V, Offset = 600 kHz, BW = 1 Hz	122.0*	—	—	dBc/Hz
		V_{CC} = 2.8 V, Vt = 1.425 V, Offset = 1.6 MHz, BW = 1 Hz	132.0*	—	—	dBc/Hz
		V_{CC} = 2.8 V, Vt = 1.425 V, Offset = 3 MHz, BW = 1 Hz	142.0*	—	—	dBc/Hz
		V_{CC} = 2.8 V, Vt = 1.425 V, Offset = 10 MHz, BW = 1 Hz	147.0*	—	—	dBc/Hz
Higher harmonics	Hs	V_{CC} = 2.8 V, Vt = 1.425 V, 2nd, 3rd	—	—	–10.0*	dBc
Power supply variation	Push	V_{CC} = 2.8 V ± 0.07 V, Vt = 1.425 V	—	—	±500*	kHz
Load variation	Pull	V_{CC} = 2.8 V, Vt = 1.425 V, VSWR = 2 ALL PHASE	—	—	±1000*	kHz
Temperature drift	Td	Ta = +25 (+50/–45) °C	—	—	±3000*	kHz

* : Ta = –20°C to +75°C

9. For GSM (Part number : VC-2R8A50-1360)

• **Absolute Maximum Ratings**

Parameter	Symbol	Rating		Unit
		Min.	Max.	
Input DC voltage	V_{CC}	—	+3.0	V
Control voltage	Vt	—	+3.0	V
Operating temperature	Ta	–20	+80	°C
Storage temperature	Tstg	–30	+80	°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.

• **Electrical Characteristics**

(Ta = +25°C ± 3°C)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Current consumption	I_{CC}	V_{CC} = 2.85 V, Vt = 1.3 V	—	—	9.0	mA
Frequency	fmin	V_{CC} = 2.85 V, Vt = 0.3 V	—	—	1280.0	MHz
Frequency	fmax	V_{CC} = 2.85 V, Vt = 2.3 V	1440.0	—	—	MHz
Control voltage sensitivity	kv	(fmax – fmin) /2.0	86.0	—	106.0	MHz/V
Oscillator output	Po	V_{CC} = 2.85 V, Vt = 1.3 V	–3.0	—	—	dBm
C/N	C/N	V_{CC} = 2.85 V, Vt = 1.3 V, Offset = 10 kHz, BW = 1 Hz	94.0	—	—	dBc/Hz
		V_{CC} = 2.85 V, Vt = 1.3 V, Offset = 3 MHz, BW = 1 Hz	145.0	—	—	dBc/Hz
Higher harmonics	Hs	V_{CC} = 2.85 V, Vt = 1.3 V, 2nd, 3rd	—	—	–10.0	dBc
Power supply variation	Push	V_{CC} = 2.85 V ± 0.15 V, Vt = 1.3 V	—	—	±1000	kHz
Load variation	Pull	V_{CC} = 2.85 V, Vt = 1.3 V, VSWR = 2 ALL PHASE	—	—	±2000	kHz
Temperature drift	Td	Ta = +25 (+55/–45) °C	—	—	±3000	kHz

10. For PHS (Part number : VC-2R7A50-1652)

• **Absolute Maximum Ratings**

Parameter	Symbol	Rating		Unit
		Min.	Max.	
Input DC voltage	V_{CC}	—	+5.0	V
Control voltage	Vt	—	+5.0	V
Operating temperature	Ta	–20	+60	°C
Storage temperature	Tstg	–35	+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.

• Electrical Characteristics

(Ta = +25°C ± 3°C)

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Current consumption	I_{CC}	V_{CC} = 2.7 V, Vt = 0.4 V to 2.1 V	—	—	5.5*	mA
Frequency	fmin	V_{CC} = 2.7 V, Vt = 0.4 V	—	—	1632.5*	MHz
Frequency	fmax	V_{CC} = 2.7 V, Vt = 2.1 V	1672.5*	—	—	MHz
Control voltage sensitivity	kv	(fmax – fmin) /1.7	36.0	—	48.0	MHz/V
Oscillator output	Po	V_{CC} = 2.7 V, Vt = 0.4 V to 2.1 V	–6.0*	—	—	dBm
		V_{CC} = 2.7 V, Vt = 0.0 V to 2.7 V	–10.0*	—	—	dBm
C/N	C/N	V_{CC} = 2.7 V, Vt = 0.4 V to 2.1 V, Offset = 100 kHz, BW = 1 Hz	109.0*	—	—	dBc/Hz
Higher harmonics	Hs	V_{CC} = 2.7 V, Vt = 0.4 V to 2.1 V, 2nd, 3rd	—	—	–15.0*	dBc
Power supply variation	Push	V_{CC} = 2.7 V ± 0.1 V, Vt = 0.4 V to 2.1 V	—	—	±600	kHz
Load variation	Pull	V_{CC} = 2.7 V, Vt = 0.4 V to 2.1 V, VSWR = 2 ALL PHASE	—	—	±1000	kHz
Temperature drift	Td	Ta = +25 (+45/–35) °C	—	—	±3000	kHz

* : Ta = –20°C to +60°C

11. For PHS (Part number : VC-3R0A50-1668N)

• **Absolute Maximum Ratings**

Parameter	Symbol	Rating		Unit
		Min.	Max.	
Input DC voltage	V_{CC}	—	+3.2	V
Operating temperature	Ta	–10	+60	°C
Storage temperature	Tstg	–30	+85	°C
Storage humidity	Hstg	5	85	%

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.

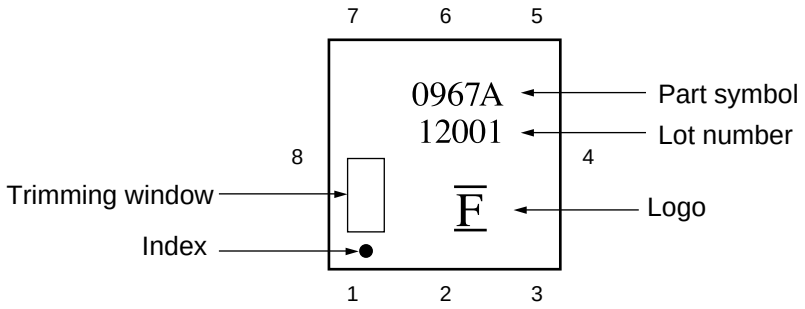
• Electrical Characteristics

(Ta = +25°C ± 3°C)

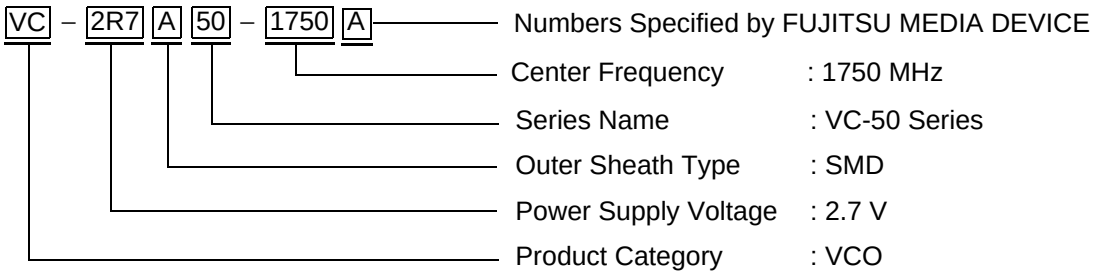
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Current consumption	I_{CC}	V_{CC} = 3.0 V, Vt = 1.5 V	—	—	7.0*	mA
Frequency	fmin	V_{CC} = 3.0 V, Vt = 0.5 V	—	—	1649.7*	MHz
Frequency	fmax	V_{CC} = 3.0 V, Vt = 2.5 V	1686.3*	—	—	MHz
Control voltage sensitivity	kv	(fmax – fmin) /2.0	25.0	31.0	37.0	MHz/V
Oscillator output	Po	V_{CC} = 3.0 V, Vt = 1.5 V	–6.0*	—	—	dBm
C/N	C/N	V_{CC} = 3.0 V, Vt = 1.5 V, Offset = 100 kHz, BW = 1 Hz	110.0*	—	—	dBc/Hz
Higher harmonics	Hs	V_{CC} = 3.0 V, Vt = 1.5 V, Up to 3rd	—	—	–15.0	dBc
Power supply variation	Push	V_{CC} = 3.0 V ± 0.2 V, Vt = 1.5 V	—	—	±800	kHz
Load variation	Pull	V_{CC} = 3.0 V, Vt = 1.5 V, VSWR = 2 ALL PHASE	—	—	±1000	kHz
Temperature drift	Td	Ta = +25°C ± 35°C	—	—	±4000*	kHz

* : Ta = –10°C to +60°C

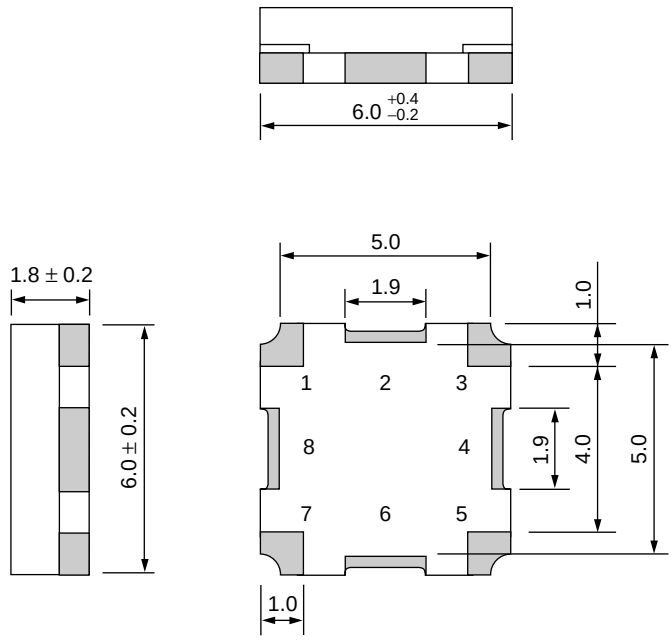
■ MARKING



■ PART NUMBER DESIGNATION

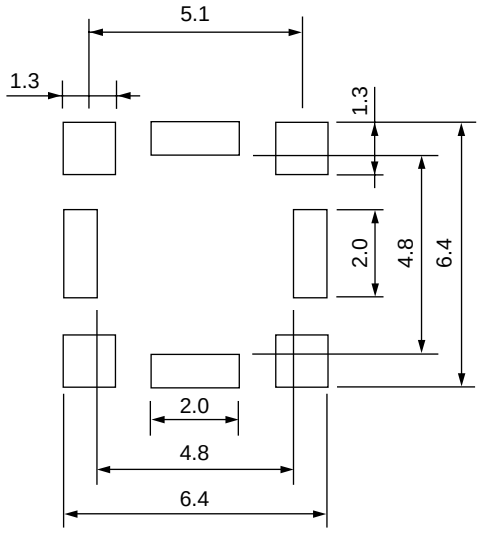


■ PACKAGE DIMENSION



Dimensions in mm

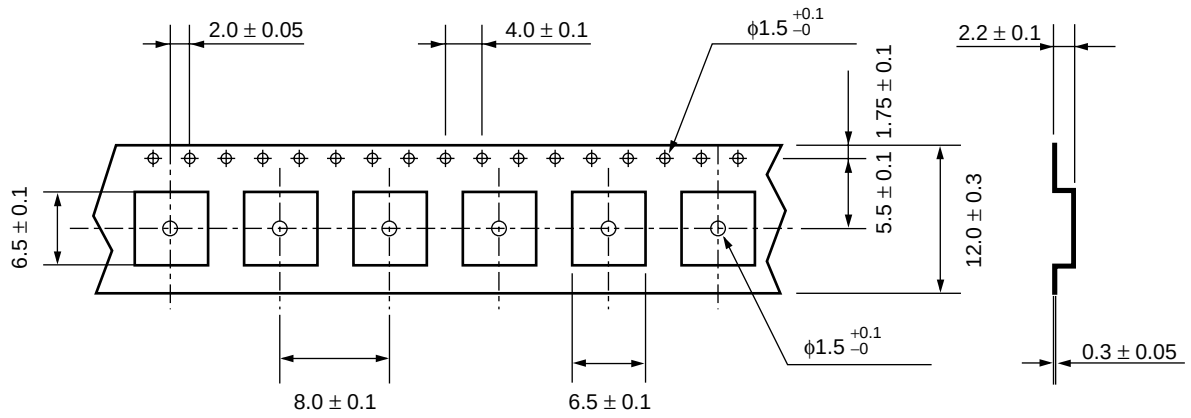
■ RECOMMENDED PATTERN FOR SOLDERING



Dimensions in mm
Dimension tolerance : ± 0.1 mm

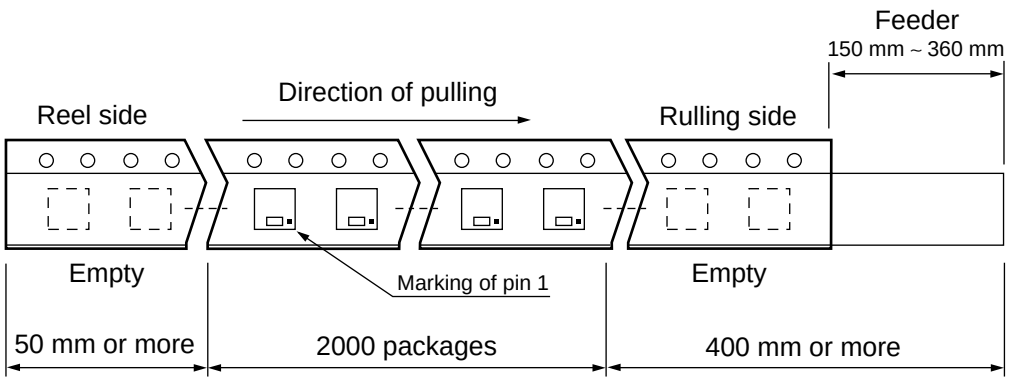
■ TAPING AND PACKAGING

(1) Carrier Tape and Packaging

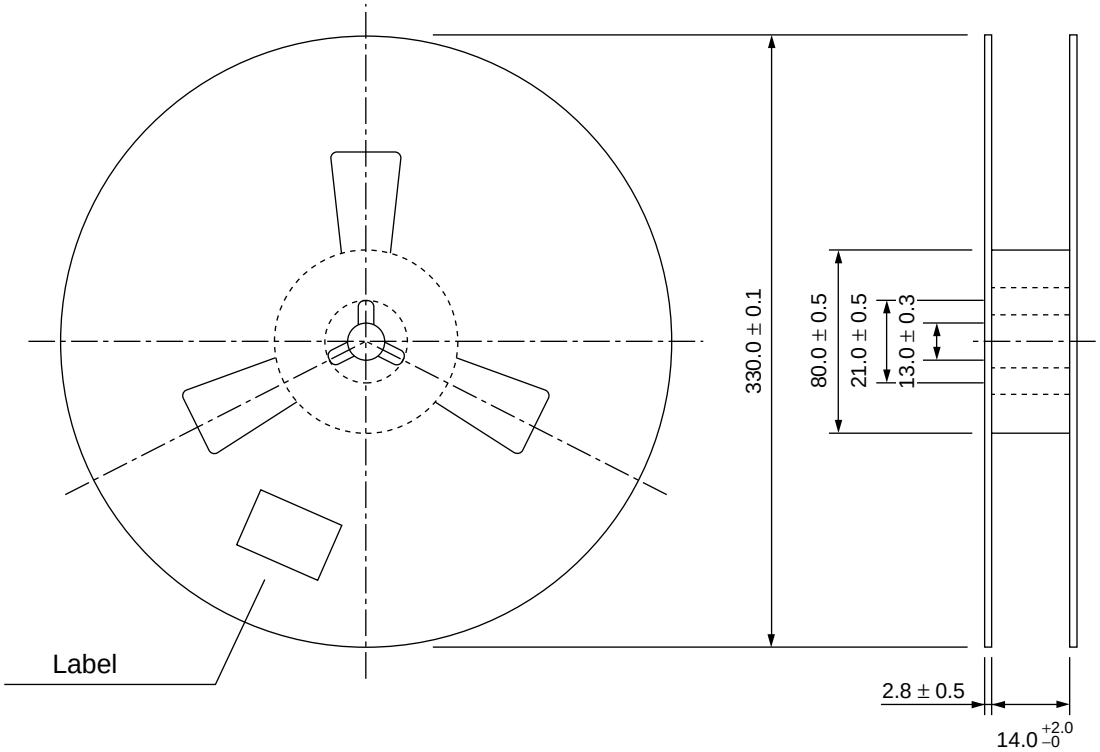


Dimensions in mm

(2) Taping Layout



(3) Reel Shape and Dimensions



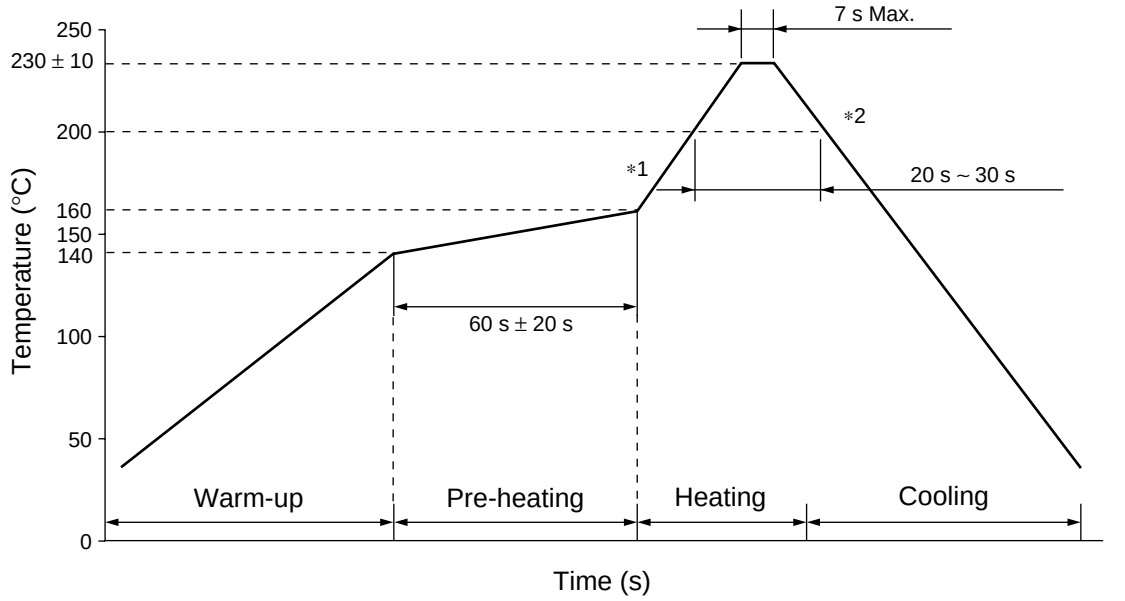
Note : The label specifies the part number, quantity, and lot number.

Volume : 2000 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.

VC-50 Series

FUJITSU MEDIA DEVICES LIMITED

For further information please contact:

Japan

FUJITSU MEDIA DEVICE LIMITED
International Sales & Marketing DEPT.
Shin-Yokohama Square Bldg.,14F,
Shin-yokohama 2-3-12,
Kohoku-ku, Yokohama,
Kanagawa 222-0033, Japan
Tel: +81-45-471-0061
Fax: +81-45-471-0076

http://www.fujitsu.co.jp/hypertext/fmd/English/index.html

North and South America

FUJITSU MICROELECTRONICS, INC.
3545 North First Street,
San Jose, CA 95134-1804, U.S.A.
Tel: +1-408-922-9000
Fax: +1-408-922-9179

Customer Response Center
Mon. - Fri.: 7 am - 5 pm (PST)
Tel: +1-800-866-8608
Fax: +1-408-922-9179

http://www.fujitsumicro.com/

Europe

FUJITSU MICROELECTRONICS EUROPE GmbH
Am Siebenstein 6-10,
D-63303 Dreieich-Buchschlag,
Germany
Tel: +49-6103-690-0
Fax: +49-6103-690-122

http://www.fujitsu-fme.com/

Asia Pacific

FUJITSU MICROELECTRONICS ASIA PTE. LTD.
#05-08, 151 Lorong Chuan,
New Tech Park,
Singapore 556741
Tel: +65-281-0770
Fax: +65-281-0220

http://www.fmap.com.sg/

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