

# Device for Mobile Phones

## Ultra-Small CSP SAW Filter

### **F5/F6 Series (SAW BPF 700MHz to 2,500MHz)**

### **G5/G6 Series (Dual SAW BPF 700MHz to 2,200MHz)**

Compared to conventional products, ultra-small size has been achieved. Single filter (2.0×1.6×0.6mm) has a volume ratio of 38% compared to conventional products.

Dual filter (2.5×2.0×0.6mm) has a volume ratio of 44% compared to conventional products.

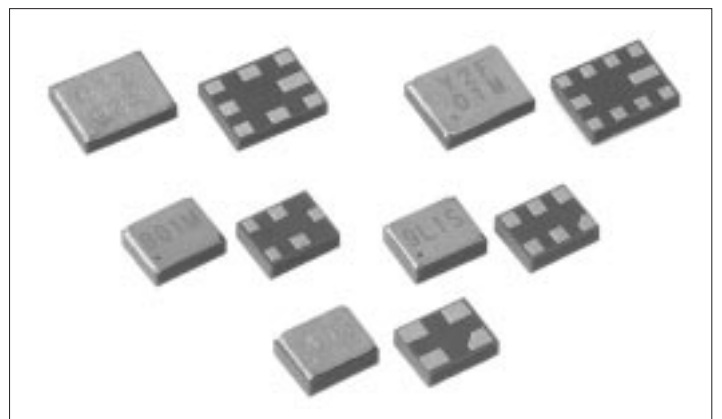
## Overview

Competition regarding the miniaturization of mobile phones has decreased somewhat compared to the past. However, competition related to the miniaturization of internal circuits and mounted parts for mobile phones has become increasingly heated. One reason for this is the incorporation of multimedia functions such as color displays, digital cameras, and movie recording/playing. Another reason relates to the complication of the RF circuit section due to the adoption of dual-, triple-, or quadband-type mobile phones in which various nations' systems have been incorporated so that a single mobile phone will suffice for business trips and travel. While the internal mechanisms of mobile phones have become extremely complicated, it remains impossible to increase the size even when there is a further functional addition. For the RF circuit section in particular, the miniaturization of mounted devices has become essential due to the addition of circuits for multiband types including dual and triple, increases in memory for image-processing sections, and the mounting of cameras or color displays, etc.

FUJITSU has therefore developed an ultra-small CSP SAW filter with a volume ratio of approximately 40% (by our

comparison). Specifically, ultra-thinness with a device height of 0.6mm (max.) has been achieved to enable front-end module mounting, thereby leading to a variety of products supporting various mobile phone systems.

Photo 1 External View



## Features

### ■ Ultra-small size

Single filter: 2.0 (typ.)×1.6 (typ.)×0.6 (max.) mm (volume ratio compared to conventional product 38%)

Dual filter: 2.5 (typ.)×2.0 (typ.)×0.6 (max.) mm (volume ratio compared to conventional product 44%)

**Fig.1** presents the external dimension for the single filter and **Fig.2** depicts the external dimensions for the dual filter.

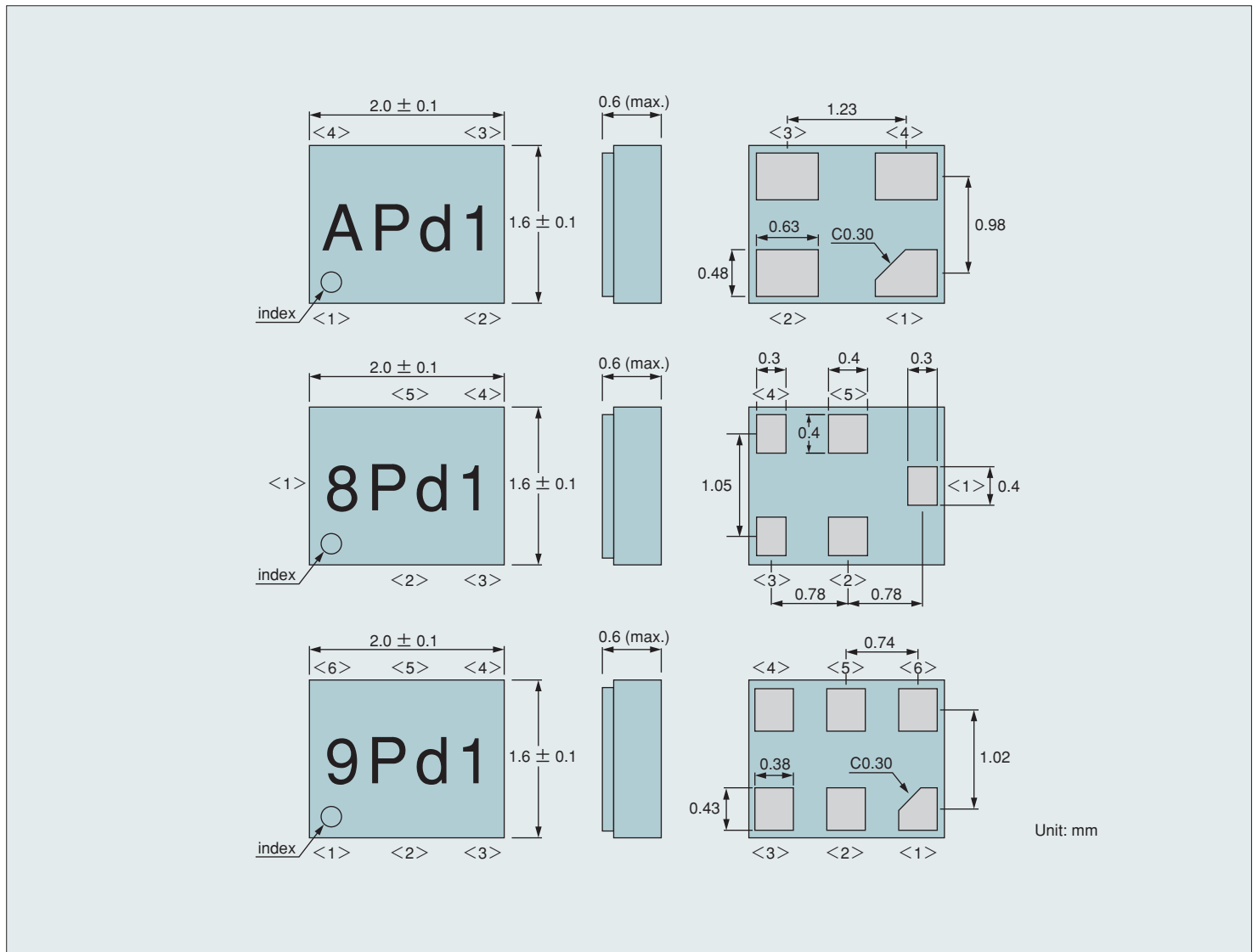
### ■ Low insertion loss, high attenuation property

Insertion loss IL: 1.9dB (typ.), Tx band attenuation: 32dB (typ.) (ex. EGSM Rx 150Ω balance filter)

### ■ High reliability with hermetic seal (sealing)

### ■ Excellent balanced performance (balanced type)

**Figure 1** Single-Filter External Dimensions



## Characteristics

**Fig.3** presents an example of characteristics for P/N: FAR-F5EB-942M50-B28C (EGSM Rx 150 Ω balance filter).

## List of Products

**Table 1** provides a list of models for the single type, and **Table 2** lists those for the dual type\*<sup>1</sup>. \*

### NOTES

\*1: The products listed in Tables 1 and 2 are those available at the time of article publication. Please note that they may change without notice.

**Table 1** List of Single-Type Models

		Unbalanced type	Balanced type				
			Pins	50 Ω	100 Ω	150 Ω	200 Ω
EGSM	Tx	FAR-F5EA-897M50-D27C	5	—	—	—	FAR-F5EB-897M50-B28K
			6	—	FAR-F5EC-897M50-B29J	—	FAR-F5EC-897M50-B29K
	Rx	FAR-F5EA-942M50-D27D	5	FAR-F5EB-942M50-B28A	FAR-F5EB-942M50-B28B	FAR-F5EB-942M50-B28C	FAR-F5EB-942M50-B28C*
			6	—	—	FAR-F5EC-942M50-B29C	FAR-F5EC-942M50-B29C*
DCS	Rx	FAR-F6EA-1G8425-D2AB	5	FAR-F6EB-1G8425-B2BA	FAR-F6EB-1G8425-B2BB	FAR-F6EB-1G8425-B2BC	FAR-F6EB-1G8425-B2BD
			6	—	—	FAR-F6EC-1G8425-B2CE	FAR-F6EC-1G8425-B2CD
CDMA (GSM850)	Tx	FAR-F5EA-836M50-D27A	5	—	—	—	—
			6	—	FAR-F5EC-836M50-B29L	—	FAR-F5EC-836M50-B29M
	Rx	FAR-F5EA-881M50-D27B	5	—	FAR-F5EB-881M50-B28R	FAR-F5EB-881M50-B28P	—
			6	—	—	FAR-F5EC-881M50-B29P	FAR-F5EC-881M50-B29Q
J-CDMA	Tx	FAR-F5EA-906M00-D27E	5	—	—	—	—
			6	—	—	—	—
	Rx	—	5	—	FAR-F5EB-851M00-B28Y	—	—
			6	—	—	—	—
PCS	Tx	FAR-F6EA-1G8800-L2AN	5	—	—	—	—
			6	—	—	—	—
	Rx	FAR-F6EA-1G9600-L2AP FAR-F6EA-1G9600-D2AC	5	—	FAR-F6EB-1G9600-B2BK	FAR-F6EB-1G9600-B2BW	FAR-F6EB-1G9600-B2BW*
			6	FAR-F6EC-1G9600-B2CJ	—	FAR-F6EC-1G9600-B2CL	FAR-F6EB-1G9600-B2CL*
W-CDMA	Tx	—	5	—	FAR-F6EB-1G9500-B2BQ	—	FAR-F6EB-1G9500-B2BR
			6	—	FAR-F6EC-1G9500-B2CQ	—	FAR-F6EC-1G9500-B2CR
	Rx	—	5	—	FAR-F6EB-2G1400-B2BN	—	FAR-F6EB-2G1400-B2BP
			6	—	FAR-F6EC-2G1400-B2CN	—	FAR-F6EC-2G1400-B2CP
GPS	—	FAR-F6EA-1G5754-D2AK	5	—	FAR-F6EB-1G5754-B2BS	—	—
		FAR-F6EA-1G5754-D2AA	6	—	—	—	—

Figure 2 Dual-Filter External Dimensions

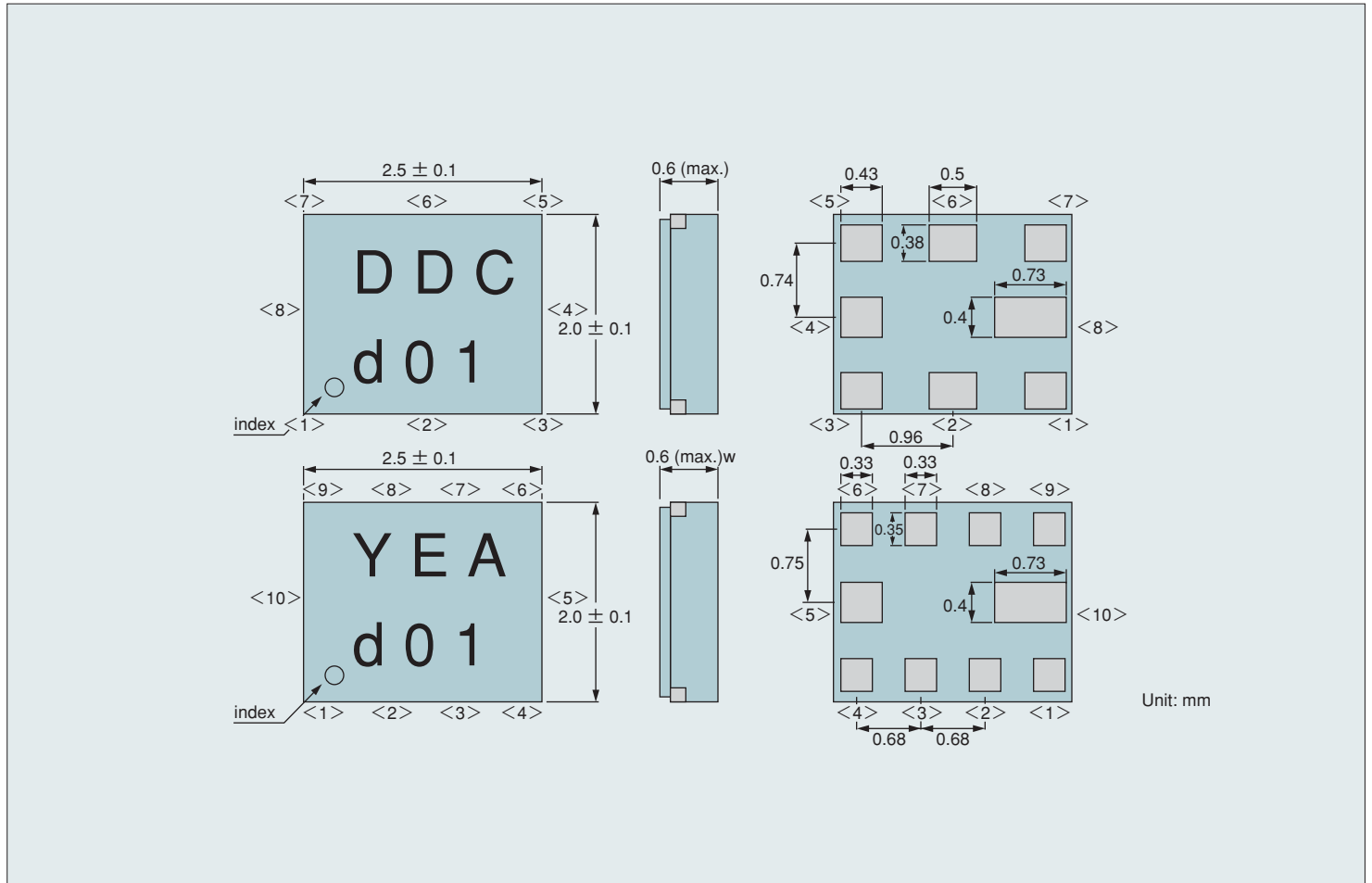


Table 2 List of Dual-Type Models

		Unbalanced type	Balanced type			
			50 Ω	100 Ω	150 Ω	200 Ω
EGSM+DCS	Rx	FAR-G6ED-1G8425-D2DC	—	—	FAR-G6EE-1G8425-Y2EA	—
			—	—	FAR-G6EE-1G8425-Y2FQ	—
EGSM+PCS	Rx	—	—	—	FAR-G6EE-1G9600-Y2EG	—
			—	—	FAR-G6EE-1G9600-Y2FG	—
GSM850+DCS	Rx	—	—	—	FAR-G6EE-1G8425-Y2EE	—
			—	—	FAR-G6EE-1G8425-Y2FE	—
GSM850+EGSM	Rx	FAR-G5ED-942M50-D2DF	—	—	FAR-G5EE-942M50-Y2ED	—
			—	—	FAR-G5EE-942M50-Y2FD	—
DCS+PCS	Rx	FAR-G6ED-1G9600-D2DH	—	—	FAR-G6EE-1G9600-Y2EF	—
			—	—	FAR-G6EE-1G9600-Y2FF	—
CDMA+PCS GSM850+PCS	Rx	—	—	FAR-G6EE-1G9600-Y2EJ	—	—
			—	FAR-G6EE-1G9600-Y2FJ	FAR-G6EE-1G9600-Y2FC	—

Figure 3 Example of P/N: FAR-F5EB-942M50-B28C Characteristics

