

**CXM3519ER/
CXM3521AER**

GSM/UMTS Dual Mode 8-Band Low Insertion Loss/Low-Distortion High-Frequency Antenna Switch Modules for Cellular Phones



Sony's antenna switches achieve low insertion loss and low-distortion through Sony's unique JPHEMT process technology. By combining this technology with a CMOS decoder, Sony has achieved low-voltage operation and even lower distortion characteristics. These devices incorporate a GaAs IPD low-pass filter to achieve a low mounting profile package. Furthermore, no DC cut capacitor is required on the RF port, which contributes to reducing the number of components. The CXM3519ER and CXM3521AER are multiband antenna switch modules that support the latest trend towards even thinner cellular phones.

- Low insertion loss, low distortion
Insertion loss: 0.85 dB@800 MHz,
0.88 dB@1.9 GHz
IMD3: -108 dBm@800 MHz,
-105 dBm@1.95 GHz

■ Built-in GaAs IPD low-pass filter

- Miniature low-profile package
3.0 mm × 3.8 mm × 0.8 mm
(CXM3519ER)
3.8 mm × 4.4 mm × 0.8 mm
(CXM3521AER)

- No DC cut capacitor required on the RF port

Multiband Support

The CXM3519ER has an SP10T structure that can switch between 6 GSM channel and 4 UMTS channel pins. It can also be used as an SP9T switch.

In contrast, the CXM3521AER has an 3P9T structure with three antenna pins and is the industry's largest scale MMIC switch for the consumer market. (See figure 1.)

Low Insertion Loss, Low Distortion

The CXM3519ER and CXM3521AER achieve low insertion loss through Sony's unique

JPHEMT*1 process. This significantly contributes to reduced current consumption during transmission and improved receiver sensitivity. (See table 1.) While there is a trend towards increasingly strict distortion characteristic standards, optimal design of the CMOS decoder and JPHEMT switch discussed here allowed us to improve the distortion characteristics (IMD*2) by approximately 5 dB compared to current Sony products.

*1: JPHEMT: Junction Gate Pseudomorphic High Electron Mobility Transistor
*2: IMD: Inter Modulation Distortion

IPD Low-Pass Filter

Sony adopted IPD*3 technology for the built-in low-pass filter. Sony's IPD technology uses thick-film deposition laminar technology on a GaAs substrate to form high-Q inductors and low-loss stripline to achieve low-loss/high-attenuation characteristics.

Furthermore, this approach achieves further miniaturization and lower profiles than the conventional LTCC base technology (less than one half the height of an LTCC low-pass filter). (See figure 2.)

*3 IPD: Integrated Passive Device

Miniature Low-Profile Package

The CXM3519ER adopts the VQFN miniature

low-profile package. Including the external components, it achieves a mounting area reduction of over 40% compared to current products. The CXM3521AER uses the same VQFN package and also provides miniaturization. (See figure 3.)

RF Port DC Cut Capacitor not Required

Compared to current products, the CXM3519ER and CXM3521AER can provide a significant reduction in the number of components. This is because the DC cut capacitors on the RF port are no longer needed, due to Sony's unique circuit technologies.

This allows the end product circuit board mounting area to be made smaller. The reduction in the parts count can also lead to reduced total costs. (See figure 4.)

V O I C E

The CXM3519ER and CXM3521AER introduced here are, in typical Sony fashion, filled with unique technologies. These have already been well received in the market. We are now expanding our product line and are providing products to respond to a wide range of needs. I strongly recommend that you consider these devices.

Figure 1 Block Diagrams

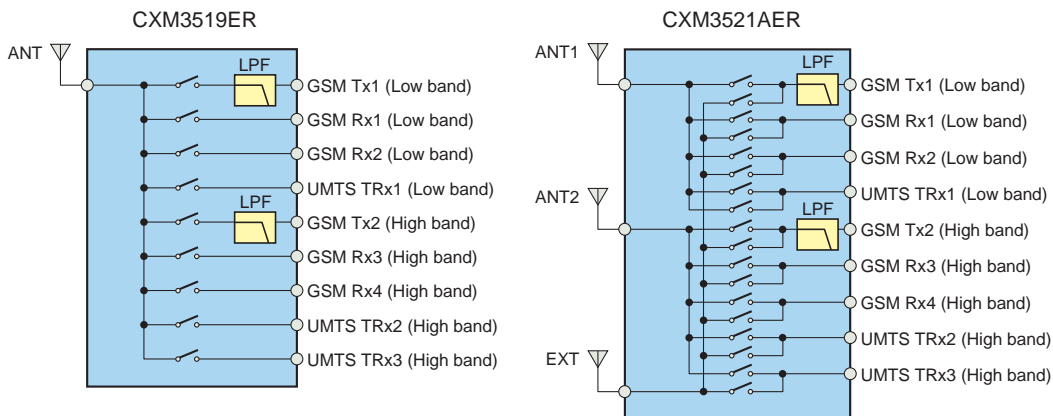


Figure 2 Internal Structures

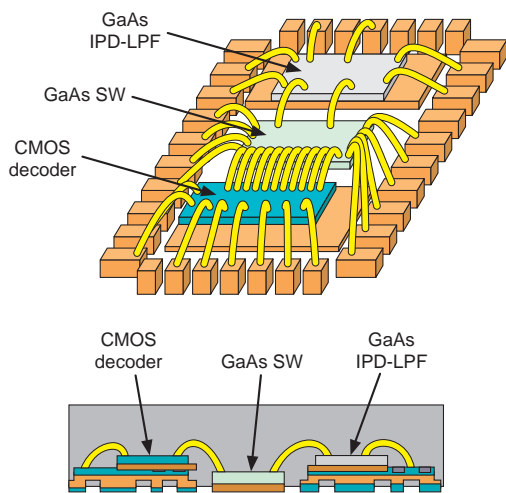


Table 1 Main Characteristics (CXM3519ER)

Item	Channels	Conditions	Typ.	Unit
Insertion loss	Ant-Tx1	824 to 915 MHz	0.85	dB
	Ant-Tx2	1710 to 1910 MHz	0.88	
	Ant-TRx1	1920 to 2170 MHz	0.50	
	Ant-TRx2	824 to 1990 MHz	0.55	
	Ant-TRx3	824 to 1990 MHz	0.55	
	Ant-TRx4	824 to 894 MHz	0.40	
	Ant-Rx1 to 4	869 to 960 MHz 1805 to 1990 MHz	0.65 1.00	
Isolation	Tx1-Ant	824 to 915 MHz	42	dB
	Tx2-Ant	1805 to 1990 MHz	37	
IMD2	TRx1 to 4-Ant	TRx: 835 MHz +20 dBm Ant: 45 MHz -15 dBm	-117	dBm
	TRx1 to 4-Ant	TRx: 1950 MHz +20 dBm Ant: 190 MHz -15 dBm	-108	
IMD3	TRx1 to 4-Ant	TRx: 835 MHz +20 dBm Ant: 790 MHz -15 dBm	-108	dBm
	TRx1 to 4-Ant	TRx: 1950 MHz +20 dBm Ant: 1760 MHz -15 dBm	-105	

Figure 3 External Dimensions

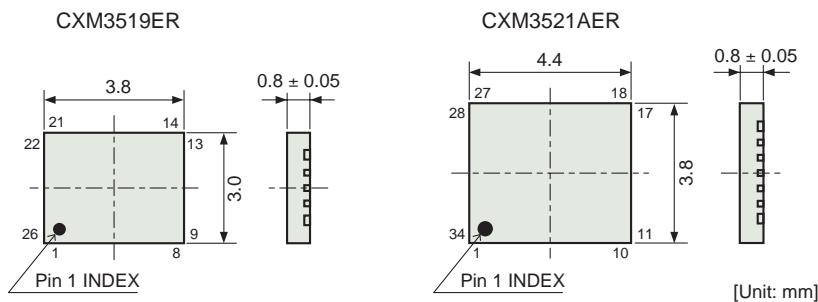


Figure 4 Mounting Area Comparison (SP9T Structure)

