

High Frequency Absorbent and Thermal Conduction Composite (FAM-5GS6)

Description :

High Frequency Absorbent and thermal conduction composite (FAM-5GS6) can be an electromagnetic waves absorber and a thermal conduction material at the same time. Due to its high frequency absorbing characteristics, it is suitable for the medium and low bands (FR1) below 6 GHz (Sub6G) in **5G NR (New Radio) technology**. FAM-5GS6 can not only reduce the **Cavity Resonance Effects** caused by high frequency, but also reduce the **PCB Edge Radiation, PCB Trace Radiation** and **Heatsink Radiation**. FAM-5GS6 also could be a thermal conductive material because it's high thermal conductivity, softness, compressibility, and self-adhesiveness. It can be closely attached on various surfaces to fill the irregular space between the heat source and the thermal module, so that the high temperature can be effectively transferred from the heat source to the thermal module, thereby achieving the cooling effect.

Features :

- Ultra thin and extremely flexible
- Can be cut any shape easily
- EMI + thermal absorber
- high thermal conductivity, softness compressibility, and self-adhesiveness
- reduce Cavity Resonance Effects
- reduce PCB Edge Radiation
- reduce PCB Trace Radiation
- reduce Heatsink Radiation

Applications :

- Small Cell
- Massive MIMO
- Digital Products
- Wireless equipments
- Network switch / Router
- Mobile Phones / Smart Phones / Phablet
- Computers (NB / Desktop / Tablet) , peripherals

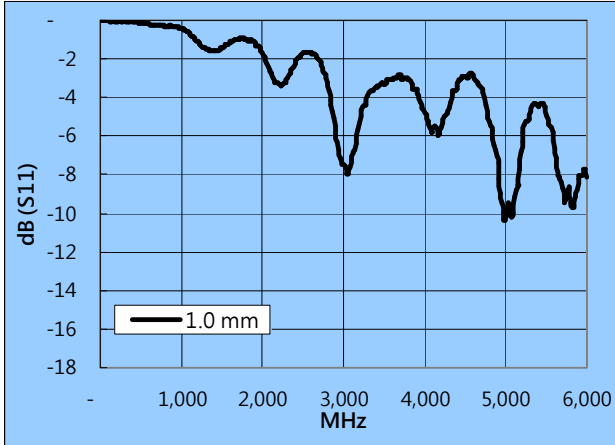


Characteristics :

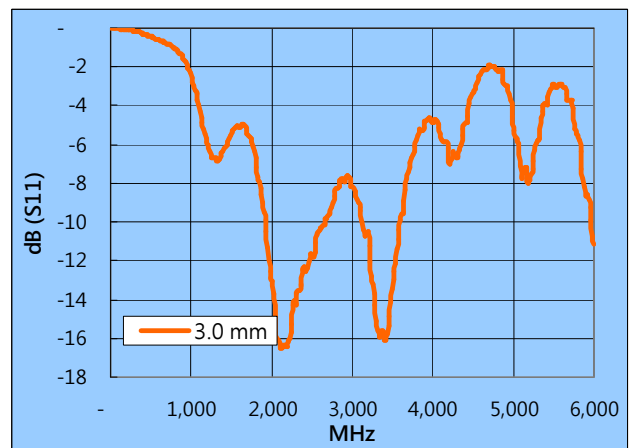
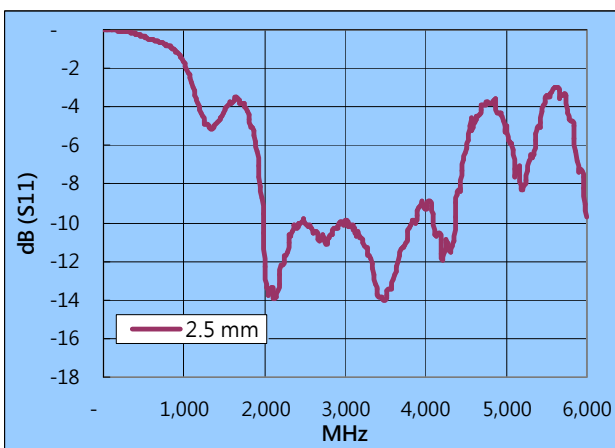
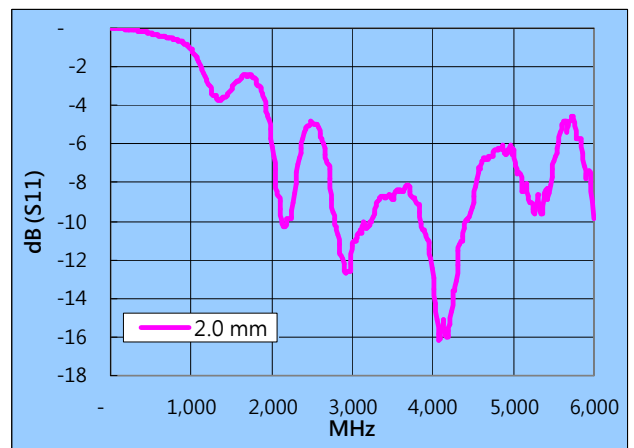
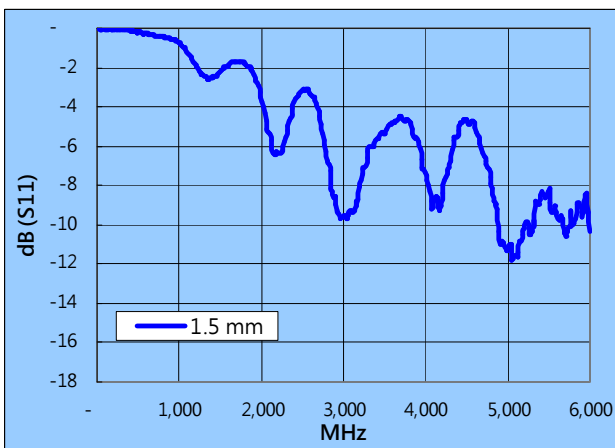
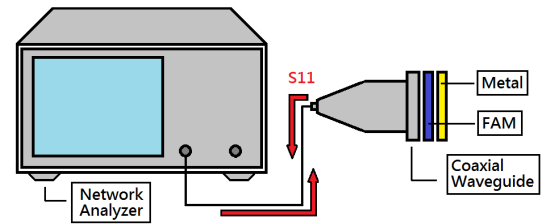
Property	unit	FAM-5GS6
Applicable Frequency	GHz	500MHz ~ 6GHz
Operating Temperature	°C	-40 ~ +180
Thickness	mm	1.0 / 1.5 / 2.0 / 2.5 / 3.0
Max. Dimension	mm	320 x 320
Permeability (μ')	-	4.3 (@100MHz)
Thermal conductivity	W/m-K	2.0
Volume Resistivity	Ohm-cm	10^{12}
Density	g/cm ³	4.4
Hardness	Shore 00	40
Tensile Strength	Kgf/cm ²	0.14
Elongation	%	5.8
RoHS 2.0 Compliance	-	2011/65/EU
Hologen-Free	-	Yes

High Frequency Absorbent and Thermal Conduction Composite (FAM-5GS6)

Return loss :

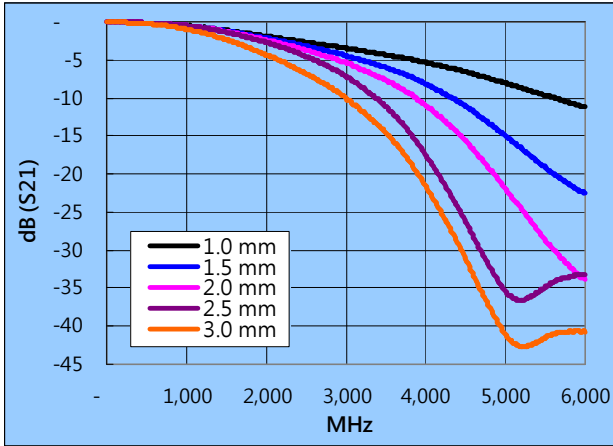


Measurement Method

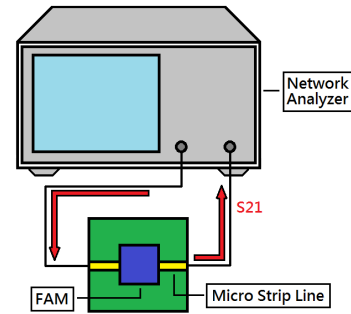


● Above test data is only for reference, not for specification data.

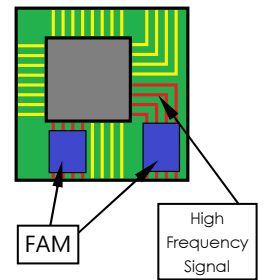
Filter Effect Test :



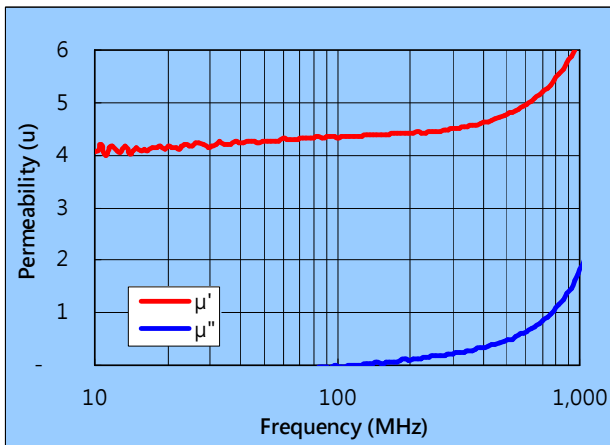
Measurement Method



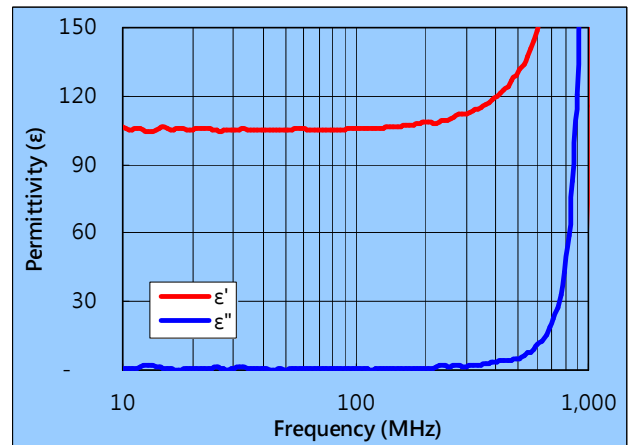
Test the signal decremental effect



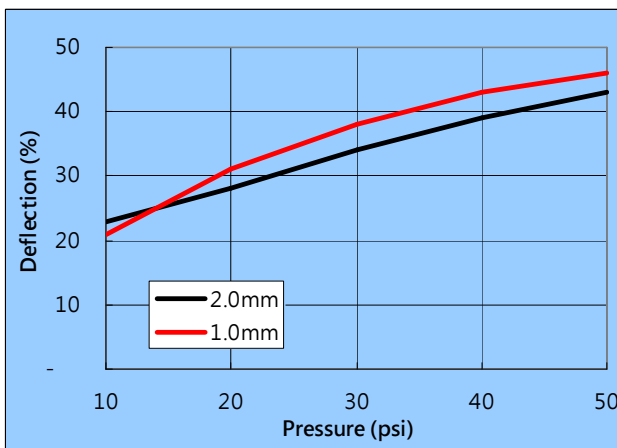
Permeability ($\mu = \mu' - j\mu''$) :



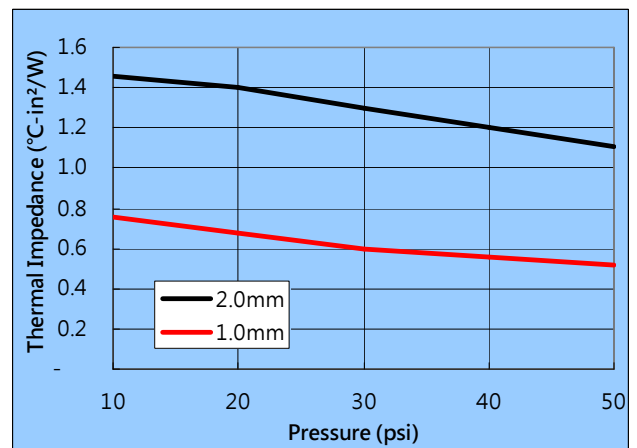
Permittivity ($\epsilon = \epsilon' - j\epsilon''$) :



Pressure - Deflection :



Pressure - Thermal Impedance :



● Above test data is only for reference, not for specification data.

FAQ:

Q1 : 5G NR (New Radio) technology?

A1 : The 5G NR (New Radio) technology in 5th generation mobile network can be divided into two according to frequency band, the band below 6 GHz (Sub-6 GHz, 450 MHz ~ 6 GHz) and millimeter wave band (mmWave, 24 ~ 100 GHz). For example, 600MHz (n71), 700MHz (n28), 2.5GHz (n41), 3.5 GHz (n78), 4.5GHz (n79).

Q2 : Cavity Resonance Effects ? How does the FAM-5GS6 work?

A2 : When the frequency becomes higher, a small-sized cavity that does not have cavity resonance may also generate cavity resonance. If the noise source contains the same frequency as the cavity resonance, a large field will be generated at the resonance frequency due to the amplification effect of the cavity. Placing FAM-5GS6 in the field path or intercepts the field, the electromagnetic energy of the field will be reduced because converted to heat, so there is no need to do grounding. It can also shift the location of the resonant frequency by changing the effective permittivity of the cavity.

Q3 : PCB Edge Radiation and PCB Trace Radiation? How does the FAM-5GS6 work?

A3 : When the edge or trace of the PCB is close metal casing, the radiated field of the PCB will induces a tiny current on the metal surface and causes a circulating current that causes radiation in any hole or gap in the current path and indirectly causes EMI problems. If the FAM-5GS6 is attached to the edge or trace of the PCB, the radiation field coupled to the metal case can be reduced and the possibility of PCB resonance problems can be reduced. Due to of the high impedance characteristics of the FAM-5GS6, the impedance of the trace has minimal impact.

Q4 : Heatsink Radiation? How does the FAM-5GS6 work?

A4 : Due to the special structure of the heatsink, each small fin can be regarded as a monopole antenna structure, and the entire heatsink can be regarded as an antenna array. Since the heatsink is often mounted above the high frequency chip, if current is coupled from the chip to the heatsink, it will emit radiation and become a efficient radiator. Generally, the way to avoid radiation is grounding (connecting heatsink to PCB reference ground). If the frequency is higher, the contact points of the grounding must more number and spacing distance must closer to get more effective in reducing radiated emissions. Due to FAM-5GS6 has good thermal conductivity, it can be placed between heatsink and chip as a thermal conductive material. Also because FAM-5GS6 has good absorbing effect, it can avoid current coupling from chip to heatsink, thus reducing potential radiation emissions and reduce the burden of grounding.

Q5 : Massive MIMO? How does the FAM-5GS6 work?

A5 : MIMO (Multiple-Input Multiple-Output), a technique for sending and receiving more than one data signal simultaneously over the same radio channel by exploiting multipath propagation. 5G Mobile Networks use massive MIMO technology, the antenna is an array of multiple antenna elements combined. FAM-5GS6 can reduce crosstalk between antenna elements and eliminate or reduce reflections to avoid signal interference.