SanRex

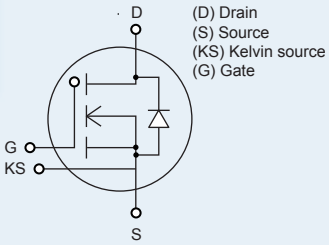
Winter

QUARTER NEWS

The newest addition to the 3S SiC MOSFET-family: discrete 4-Pin FMG50AQ120 Feb. 2022 edition

No compromises on thermal management – SiC MOSFET FMG50AQ120

FMG50AQ120
APPLICATIONS:



- EV Charger
- UPS
- Industrial Inverters
- Various switching power supplies
- Motor drives

After the first releases of modules FCA150AC120 and FCA100AC120 of our 3S SiC MOSFET family, we are announcing a new addition to the family: a compact but powerful discrete version, FMG50AQ120 in an isolated TO-247-4L package. Besides its powerfulness and the small and easily applicable structure, you can learn more about the discrete 4-Pin SiC MOSFET's other extraordinary features in the following.

1. Compact and Powerful

Although the 4-Pin TO-247-4L discrete package is small and thus easy to incorporate into different designs, it has a high heat dissipation capability with a considerably bigger than the average chip that ensures powerful operation. Thermal resistance is 0.22 °C / W on average even with the isolated structure (please read more on section *3. Isolated structure*).

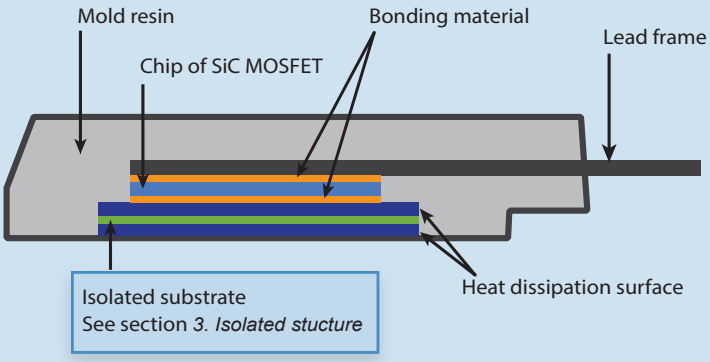
PRODUCT	Current I_D	$R_{DS(on)}$ typ	Test Condition	Voltage V_{Ds}
SanRex FMG50AQ120	$T_{C=108°C}$ 50A	15mΩ	V_{GS} = 20 V, I_D = 50 A, T_j = 150°C	1200 V
Supplier 1	$T_{C=100°C}$ 48A	68mΩ	V_{GS} = 15 V, I_D = 33.3 A, T_j = 175°C	1200 V
Supplier 2	$T_{C=100°C}$ 39A	68mΩ	V_{GS} = 18 V, I_D = 20 A, T_j = 150°C	1200 V
Supplier 3	$T_{C=100°C}$ 45A	57mΩ	V_{GS} = 18 V, I_D = 25 A, T_j = 175°C	1200 V

SanRex has an industry-leading low on-resistance (15mΩ Typ. Tj = 150 °C)

2. Clip bonding on the chip

In order to improve performance, we introduce a new, innovative method of clip bonding on the chip. Compared to a more conventional technique of wire bonding covering only a small portion of the chip, clip bonding covers the chip completely, which enables more efficient flow of power. Clip bonding technique also decreases the inductance loss.

FMG50AQ120's cross section drawing

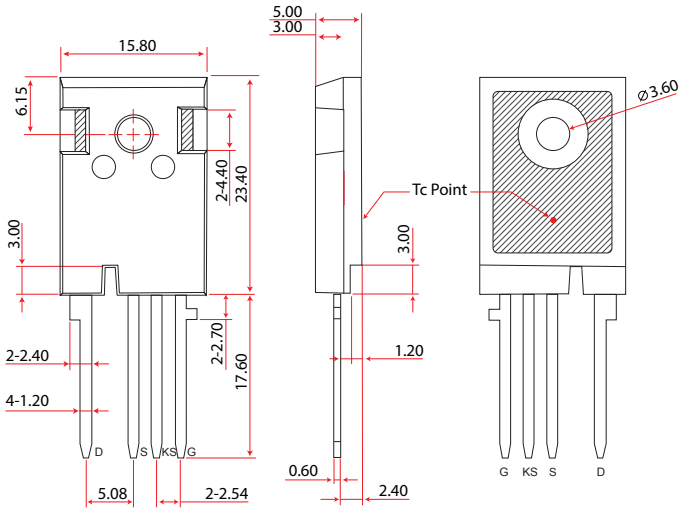


3. Isolated structure

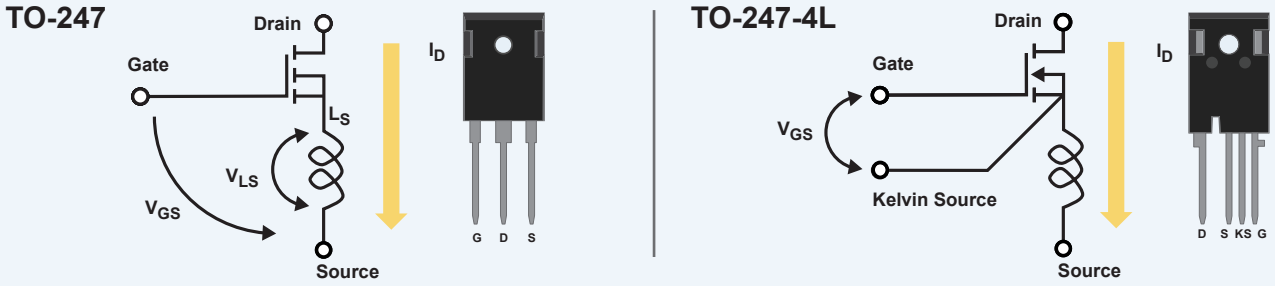
Since our discrete 4-Pin SiC MOSFET has an isolated structure, it's easier to incorporate in a power supply design that normally would need electrically insulating thermal materials or ceramic to insulate the semiconductor product. This also guarantees a significantly lower thermal resistance within the entire system.

4. 4-Pin's superior structure

The structure reduces the impact of the source terminal's inductance as well as allows faster switching and lower loss. In benchmark, the product is able to operate in frequencies of over 500kHz.



Structural comparison between TO-247 (3-Pin) and TO-247-4L (4-Pin)



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