

Si/SiC HYBRID IGBT MODULES

FOR HIGH FREQUENCY APPLICATIONS

KEY FEATURES

- ◆ Switching frequencies up to 50 kHz
- ◆ Si IGBT and SiC Schottky diodes
- ◆ Low pulse forward voltage drop
- ◆ Turn-on power loss E_{on} lowered to 65%
- ◆ 13-fold reduced reverse recovery power loss E_{rec}
- ◆ Zero reverse recovery charge
- ◆ Ultra fast speed



TYPICAL APPLICATIONS

- ◆ Inverters for solar and wind power
- ◆ High frequency converters and modulators
- ◆ Converters for induction heating
- ◆ Pulse power supply
- ◆ Uninterruptible power supply



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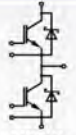



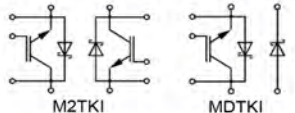
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Si/SiC HYBRID IGBT MODULES

FOR HIGH FREQUENCY APPLICATIONS

FS series

| Type | V _{CEs} | I _c DC | V _{CEsat} typ | V _F / V _{FC} typ | E _{on} typ | E _{off} typ | E _{rec} typ | R _{th(j-c)} | T _{jmax} | Case, Circuit | | | |
|--|------------------|----------------------|---------------------------|---|------------------------|-------------------------|-------------------------|----------------------|-------------------|--|--|--|--|
| | V | A | V | V | mWs | mWs | mWs | °C/W | °C | | | | |
| M2TKI-50-12FS MDTKI-50-12FS MTKID-50-12FS | 1200 | 50 | 3.20 | 1.50 | 2.7 | 2.5 | 0.3 | 0.3 | 150 |  MI3 (34x94) mm |  M2TKI | | |
| M2TKI-75-12FS MDTKI-75-12FS MTKID-75-12FS | | 75 | 3.20 | 1.50 | 4 | 3.8 | 0.45 | 0.19 | | | | | |
| M2TKI-100-12FS MDTKI-100-12FS MTKID-100-12FS | | 100 | 3.20 | 1.50 | 5.5 | 5 | 0.6 | 0.16 | | | | | |
| M2TKI-150-12FS MDTKI-150-12FS MTKID-150-12FS | | 150 | 3.20 | 1.50 | 8 | 6.4 | 0.9 | 0.1 | | | | | |
| M2TKI-200-12FS MDTKI-200-12FS MTKID-200-12FS | | 200 | 3.20 | 1.50 | 11 | 10 | 1.2 | 0.09 | | | | | |
| M2TKI-300-12FS MDTKI-300-12FS MTKID-300-12FS | | 300 | 3.20 | 1.50 | 16 | 12.8 | 1.8 | 0.064 | | | | | |
| M2TKI-400-12FS MDTKI-400-12FS | | 400 | 3.20 | 1.50 | 22 | 20 | 2.4 | 0.046 | | | | | |
| M2TKI-600-12FS MDTKI-600-12FS | | 600 | 3.20 | 1.50 | 32 | 25.6 | 3.6 | 0.032 | | | | | |
| | | | | | | | | | | | |  MI4 (62x106) mm |  MDTKI |
| | | | | | | | | | | | |  MI6 (130x140) mm |  M2TKI MDTKI |

SiC diodes modules

| Type | V _{RRM} , V _{RSM} | I _F | I _{FAV} | I _{FSM} | V _F | V ₀ | r _T | t _c max (di/dt=900 A/μs) T=125°C | R _{th(j-c)} | T _{jmax} | V _{isol} | Case | Circuit | | | | |
|--|--|-----------------------|------------------|-----------------------|----------------------|----------------|----------------|---|----------------------|-------------------|-------------------|---------------------|---|------|------|---------------------|---|
| | | T _c =110°C | | T _j =150°C | T _j =25°C | V | Ω | μs | °C/W | °C | V | | | | | | |
| | | A | A | A | | | | | | | | | | | | | |
| Half-bridges | | | | | | | | | | | | | | | | | |
| M2DF2-63-06S M2DF2-80-06S | 600 | 80 | 63 | 580 | 1.8 | 0.75 | 0.013 | 0.04 | 0.30 | 175 | 2500 | MI3-3 (34x94) mm |  | | | | |
| M2DF2-50-12S | 1200 | 75 | 50 | 320 | 1.9 | 0.66 | 0.034 | 0.06 | 0.62 | | | | | | | | |
| M2DF2-63-12S M2DF2-80-12S | | 80 | 63 | 580 | 1.9 | 0.76 | 0.015 | 0.07 | 0.32 | | | | | | | | |
| | | 120 | 80 | 780 | 1.9 | 0.76 | 0.011 | 0.07 | 0.28 | | | | | | | | |
| M2DF2-100-12S | | 80 | 100 | 640 | 1.6 | 0.76 | 0.017 | 0.06 | 0.32 | | | | | | | | |
| M2DF2-32-17S M2DF2-40-17S M2DF2-50-17S M2DF2-63-17S M2DF2-80-17S | 1700 | 50 | 32 | 190 | 1.7 | 0.75 | 0.051 | 0.1 | 0.3 | | | | | 4000 | | | |
| | | 60 | 40 | 250 | 1.7 | 0.75 | 0.043 | 0.1 | 0.26 | | | | | | | | |
| | | 80 | 50 | 360 | 1.7 | 0.75 | 0.032 | 0.12 | 0.2 | | | | | | | | |
| | | 100 | 63 | 420 | 1.7 | 0.75 | 0.026 | 0.12 | 0.16 | | | | | | | | |
| | | 120 | 80 | 480 | 1.7 | 0.75 | 0.021 | 0.12 | 0.13 | | | | | | | | |
| Single diodes | | | | | | | | | | | | | | | | | |
| MDF-32-06S MDF-40-06S MDF-63-06S MDF-80-06S | 600 | 40 | 32 | 300 | 1.8 | 0.75 | 0.026 | 0.03 | 0.55 | 175 | 2500 | MI1-1 (25x38) mm |  | | | | |
| MDF-32-12S MDF-40-12S MDF-63-12S MDF-80-12S | 1200 | 40 | 32 | 300 | 1.9 | 0.76 | 0.03 | 0.06 | 0.62 | | | | | | | | |
| | | 60 | 40 | 400 | 1.9 | 0.76 | 0.023 | 0.06 | 0.50 | | | | | | | | |
| | | 80 | 63 | 580 | 1.9 | 0.76 | 0.015 | 0.07 | 0.32 | | | | | | | | |
| | | 120 | 80 | 780 | 1.9 | 0.76 | 0.011 | 0.07 | 0.28 | | | | | | | | |
| Common cathode circuit | | | | | | | | | | | | | | | | | |
| M2DFC-63-06S M2DFC-80-06S | 600 | 80 | 63 | 580 | 1.8 | 0.75 | 0.013 | 0.04 | 0.30 | | | | | 175 | 2500 | MI3-3 (34x94) mm |  |
| M2DFC-63-12S M2DFC-80-12S | 1200 | 80 | 63 | 780 | 1.9 | 0.76 | 0.015 | 0.07 | 0.26 | | | | | | | | |
| | | 120 | 80 | 780 | 1.9 | 0.76 | 0.011 | 0.07 | 0.28 | | | | | | | | |
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