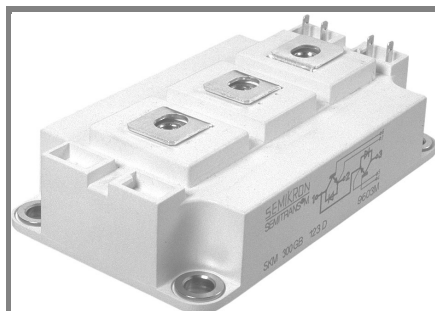


SKM 400GB124D



SEMITRANS™ 3

Low Loss IGBT Modules

SKM 400GB124D

SKM 400GAL124D

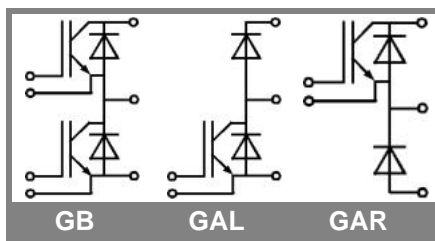
SKM 400GAR124D

Features

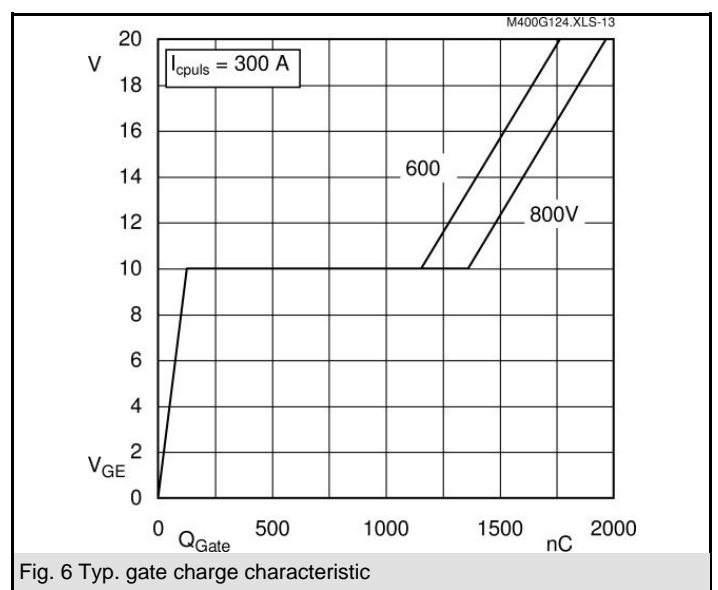
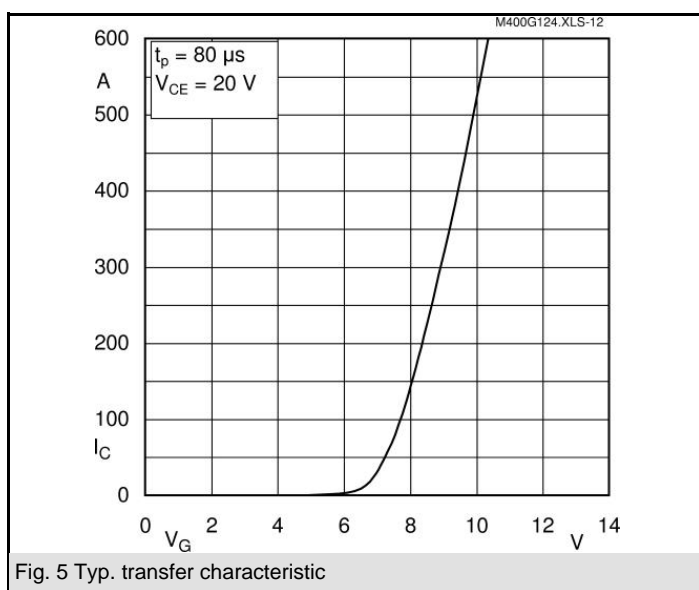
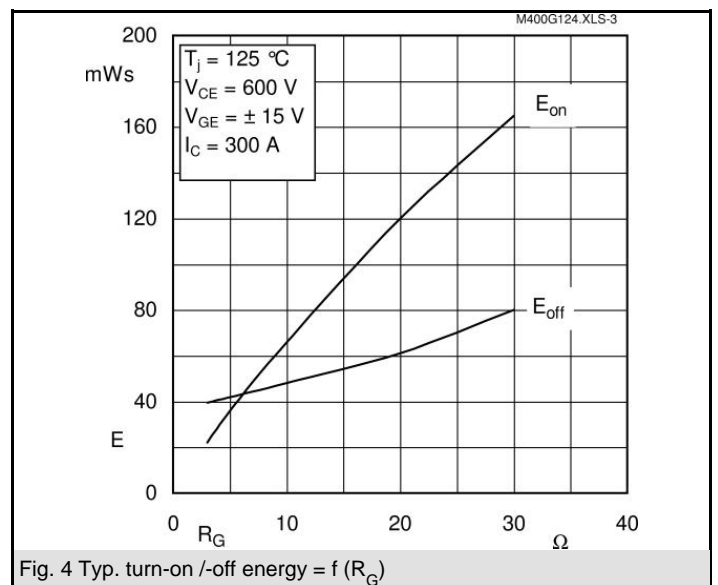
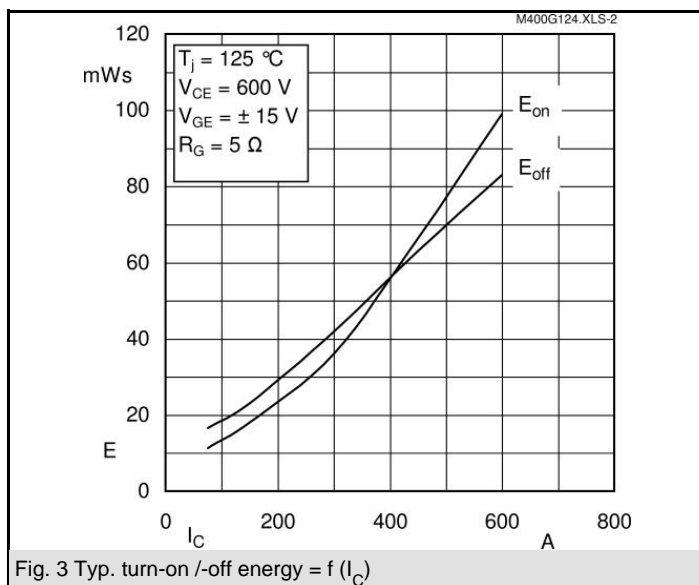
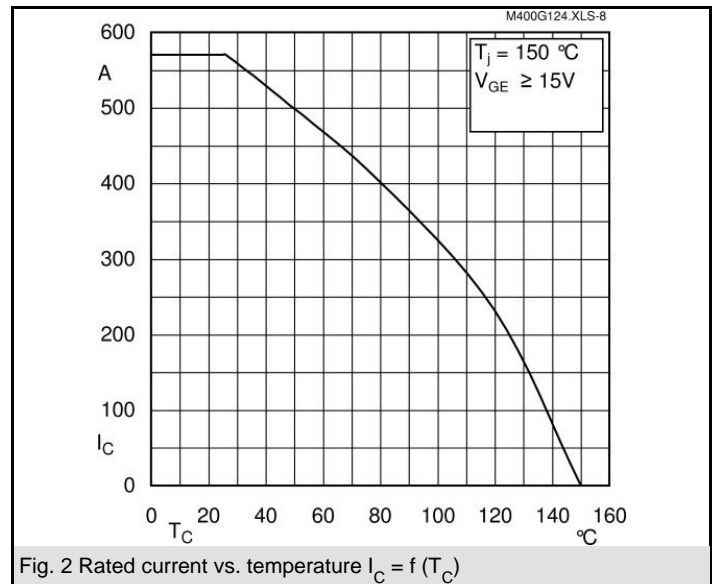
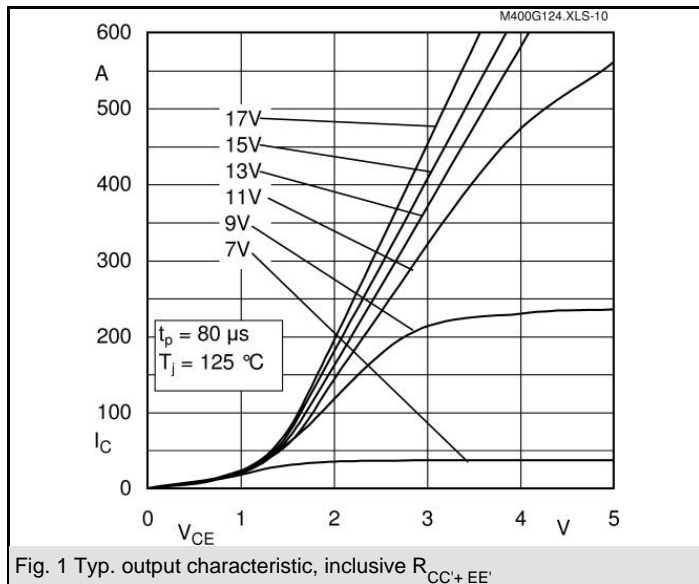
- MOS input (voltage controlled)
- N channel, homogeneous Si-structure (NPT- Non punch-through IGBT)
- Low inductance case
- Very low tail current with low temperature dependence
- High short circuit capability, self limiting to $6 \times I_{C\text{NOM}}$
- Latch-up free
- Fast & soft inverse CAL Diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology without hard mould
- Large clearance (12 mm) and creepage distance (20 mm)

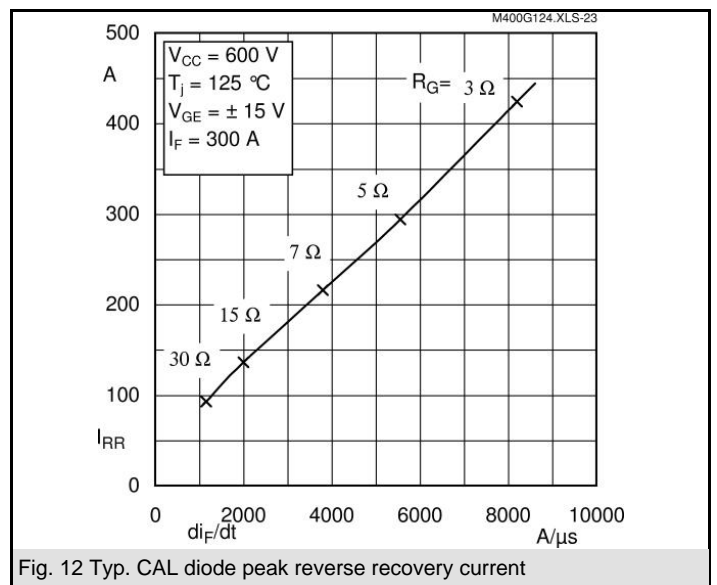
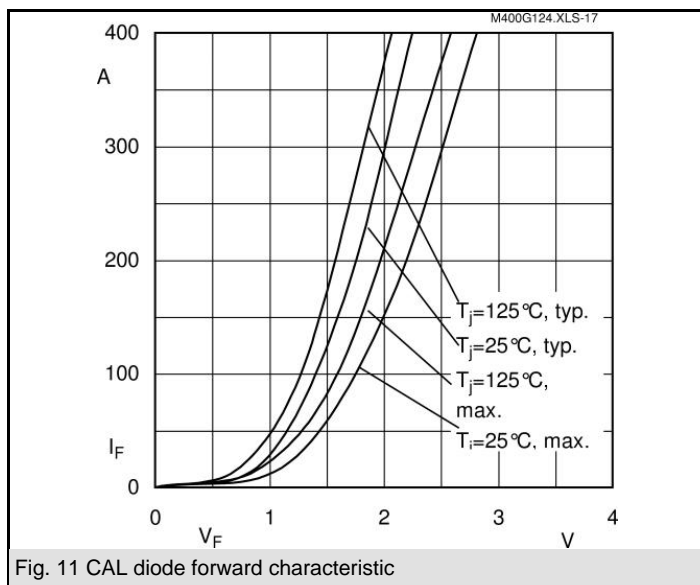
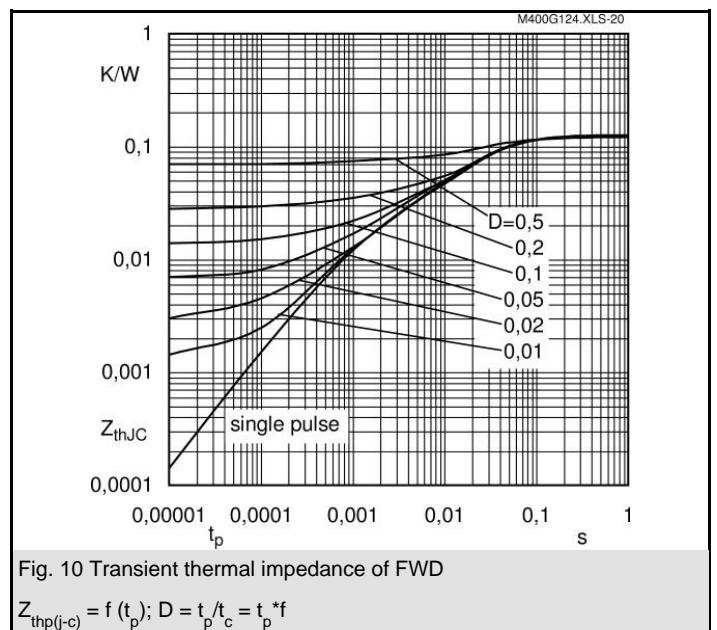
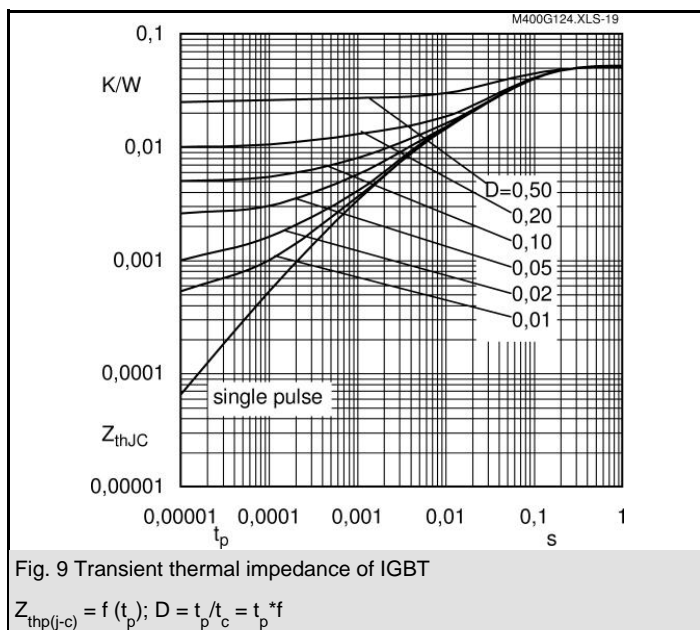
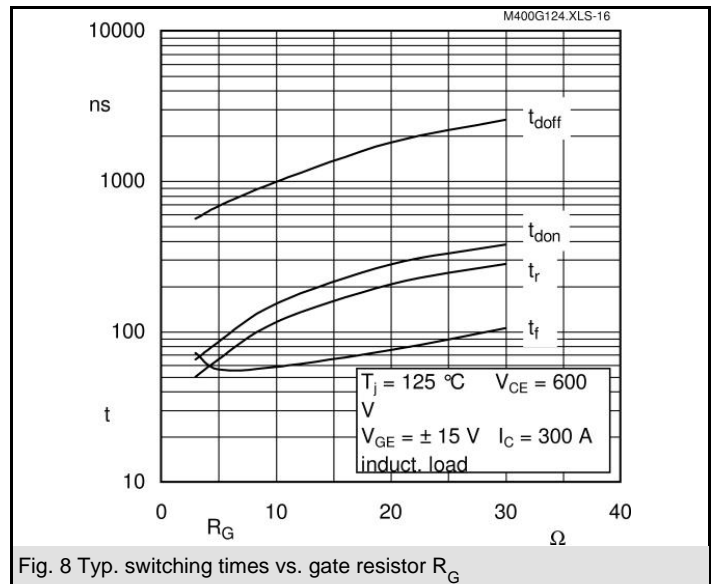
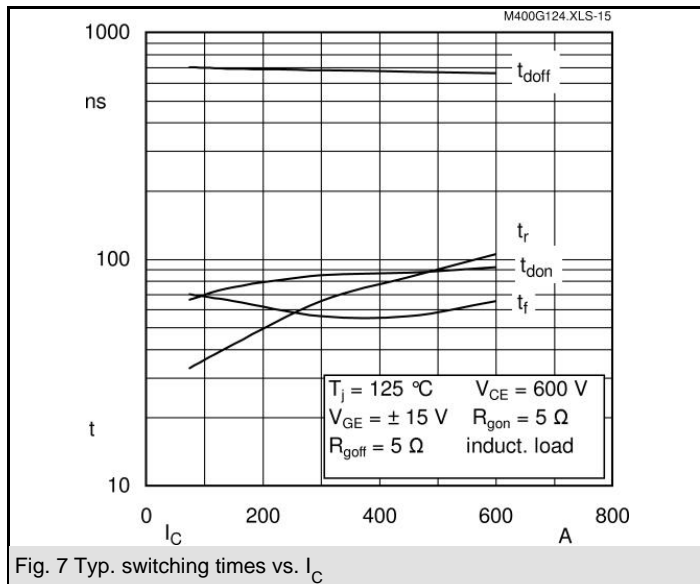
Typical Applications

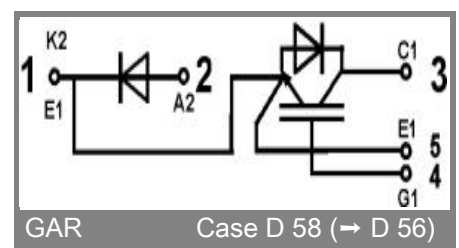
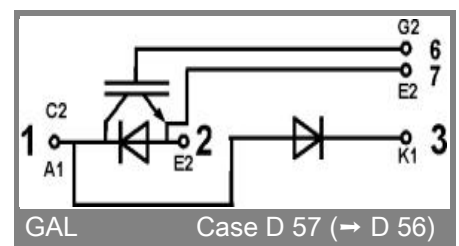
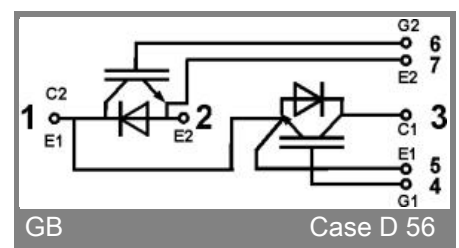
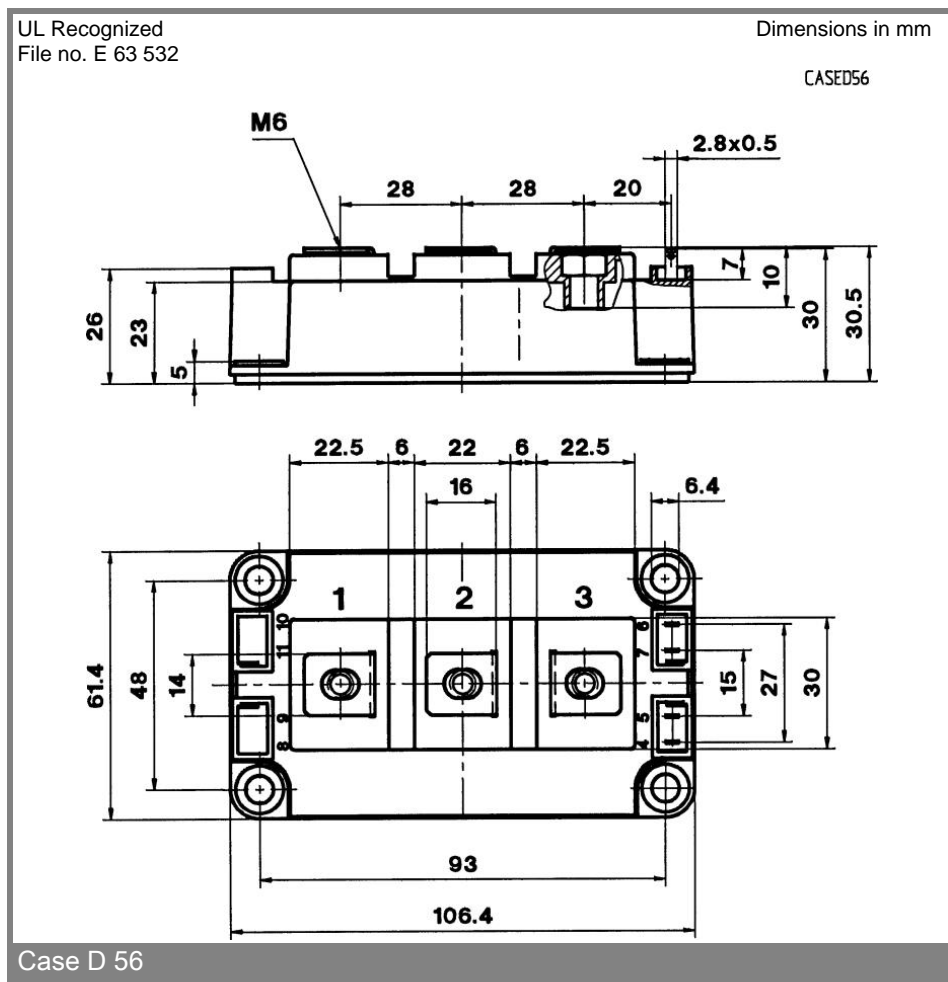
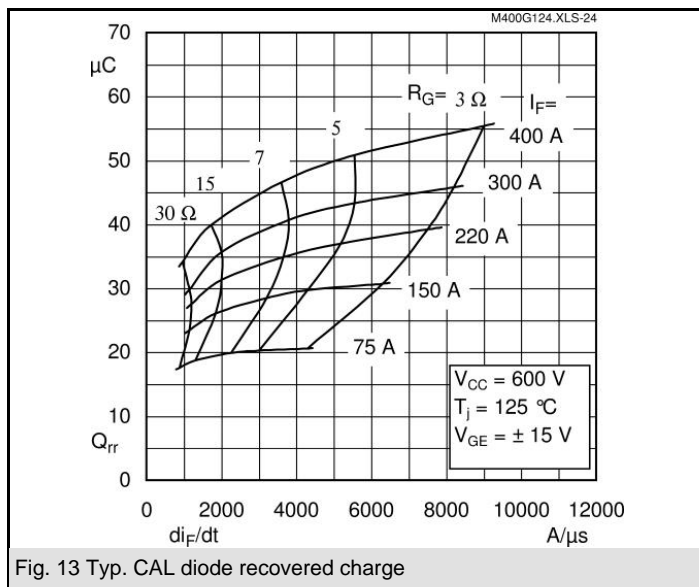
- Switching (not for lineal use)
- Inverter drives
- UPS



| Absolute Maximum Ratings | | T _c = 25 °C, unless otherwise specified | | | |
|---------------------------------------|--|--|------------|-------------|-------|
| Symbol | Conditions | Values | | | Units |
| IGBT | | | | | |
| V _{CES} | | 1200 | | | V |
| I _C | T _c = 25 (80) °C | 570 (400) | | | A |
| I _{CRM} | t _p = 1 ms | 600 | | | A |
| V _{GES} | | ± 20 | | | V |
| T _{vj} , (T _{stg}) | T _{OPERATION} ≤ T _{stg} | - 40 ... + 150 (125) | | | °C |
| V _{isol} | AC, 1 min. | 2500 | | | V |
| Inverse diode | | | | | |
| I _F | T _c = 25 (80) °C | 390 (260) | | | A |
| I _{FRM} | t _p = 1 ms | 600 | | | A |
| I _{FSM} | t _p = 10 ms; sin.; T _j = 150 °C | 2900 | | | A |
| Freewheeling diode | | | | | |
| I _F | T _c = 25 (80) °C | 390 (260) | | | A |
| I _{FRM} | t _p = 1 ms | 600 | | | A |
| I _{FSM} | t _p = 10 ms; sin.; T _j = 150 °C | 2900 | | | A |
| Characteristics | | | | | |
| | | T _c = 25 °C, unless otherwise specified | | | |
| Symbol | Conditions | min. | typ. | max. | Units |
| IGBT | | | | | |
| V _{GE(th)} | V _{GE} = V _{CE} , I _C = 12 mA | 4,5 | 5,5 | 6,5 | V |
| I _{CES} | V _{GE} = 0, V _{CE} = V _{CES} , T _j = 25 (125) °C | | 0,2 | 0,6 | mA |
| V _{CE(TO)} | T _j = 25 (125) °C | | 1,1 (1,1) | 1,25 (1,25) | V |
| r _{CE} | V _{GE} = 15 V, T _j = 25 (125) °C | | 3,3 (4,3) | 4 (5,3) | mΩ |
| V _{CE(sat)} | I _{Cnom} = 300 A, V _{GE} = 15 V, chip level | | 2,1 (2,4) | 2,45 (2,85) | V |
| C _{ies} | under following conditions | | 22 | 30 | nF |
| C _{oes} | V _{GE} = 0, V _{CE} = 25 V, f = 1 MHz | | 3,3 | 4 | nF |
| C _{res} | | | 1,2 | 1,6 | nF |
| L _{CE} | | | | 20 | nH |
| R _{CC'+EE'} | res., terminal-chip T _c = 25 (125) °C | | 0,35 (0,5) | | mΩ |
| t _{d(on)} | V _{CC} = 600 V, I _{Cnom} = 300 A | | 85 | | ns |
| t _r | R _{Gon} = R _{Goff} = 5 Ω, T _j = 125 °C | | 65 | | ns |
| t _{d(off)} | V _{GE} = ± 15 V | | 680 | | ns |
| t _f | | | 56 | | ns |
| E _{on} (E _{off}) | | | 36 (42) | | mJ |
| Inverse diode | | | | | |
| V _F = V _{EC} | I _{Fnom} = 300 A; V _{GE} = 0 V; T _j = 25 (125) | | 2 (1,8) | 2,5 | V |
| V _(TO) | T _j = (125) °C | | (1,1) | (1,2) | V |
| r _T | T _j = (125) °C | | | (3,5) | mΩ |
| I _{RRM} | I _{Fnom} = 300 A; T _j = (125) °C | | (136) | | A |
| Q _{rr} | di/dt = A/μs | | 36 | | μC |
| E _{rr} | V _{GE} = V | | | | mJ |
| FWD | | | | | |
| V _F = V _{EC} | I _F = 300 A; V _{GE} = 0 V, T _j = 25 (125) °C | | 2 (1,8) | 2,5 | V |
| V _(TO) | T _j = (125) °C | | (1,1) | (1,2) | V |
| r _T | T _j = (125) °C | | | (3,5) | mΩ |
| I _{RRM} | I _F = 300 A; T _j = (125) °C | | (136) | | A |
| Q _{rr} | di/dt = A/μs | | 36 | | μC |
| E _{rr} | V _{GE} = V | | | | mJ |
| Thermal characteristics | | | | | |
| R _{th(j-c)} | per IGBT | | | 0,05 | K/W |
| R _{th(j-c)D} | per Inverse Diode | | | 0,125 | K/W |
| R _{th(j-c)FD} | per FWD | | | 0,125 | K/W |
| R _{th(c-s)} | per module | | | 0,038 | K/W |
| Mechanical data | | | | | |
| M _s | to heatsink M6 | 3 | | 5 | Nm |
| M _t | to terminals M6 | 2,5 | | 5 | Nm |
| w | | | | 325 | g |







This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

This technical information specifies semiconductor devices but promises no characteristics. No warranty or guarantee expressed or implied is made regarding delivery, performance or suitability.