

SKM 400GB125D



SEMITRANS™ 3

Ultra Fast IGBT Modules

SKM 400GB125D

SKM 400GAL125D

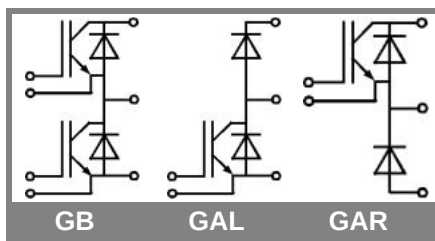
SKM 400GAR125D

Features

- N channel, homogeneous Si
- Low inductance case
- Short tail current with low temperature dependence
- High short circuit capability, self limiting to $6 \times I_{Cnom}$
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DBC Direct Copper Bonding Technology
- Large clearance (13 mm) and creepage distances (20 mm)

Typical Applications

- Switched mode power supplies at $f_{sw} > 20\text{kHz}$
- Resonant inverters up to 100 kHz
- Inductive heating
- Electronic welders at $f_{sw} > 20\text{ kHz}$



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	400 (300)			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.	4000			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		0,15	0,45	mA
V _{CE(TO)}	T _j = 25 (125) °C		1,4 (1,7)		V
r _{CE}	V _{GE} = 15 V, T _j = 25 (125) °C				mΩ
V _{CE(sat)}	I _{Cnom} = 300 A, V _{GE} = 15 V, chip level		3,3	3,85	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		70		ns
t _r	R _{Gon} = R _{Goff} = 2 Ω, T _j = 125 °C		50		ns
t _{d(off)}	V _{GE} = ± 15 V		500		ns
t _f			32		ns
E _{on} (E _{off})			17 (18)		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 = 25 (125) °C		1,1	1,2	V
r _T	T _j = 25 (125) °C		3	3,3	mΩ
I _{RRM}	I _{Fnom} = 300 A; T _j = 125 () °C		85 (140)		A
Q _{rr}	di/dt = A/μs		13 (40)		μC
E _{rr}	V _{GE} = 0 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 = 25 (125) °C				V
r _T	T _j = 25 (125) °C				mΩ
I _{RRM}	I _F = 300 A; T _j = 125 () °C				A
Q _{rr}	di/dt = A/μs				μC
E _{rr}	V _{GE} = 0 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

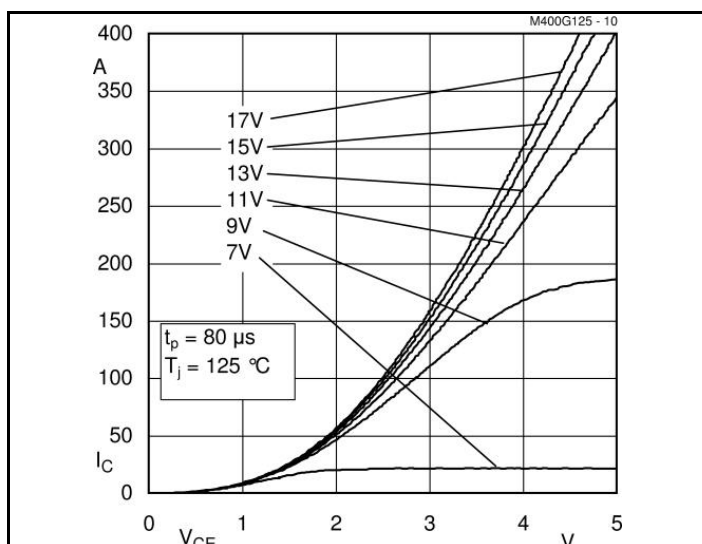


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

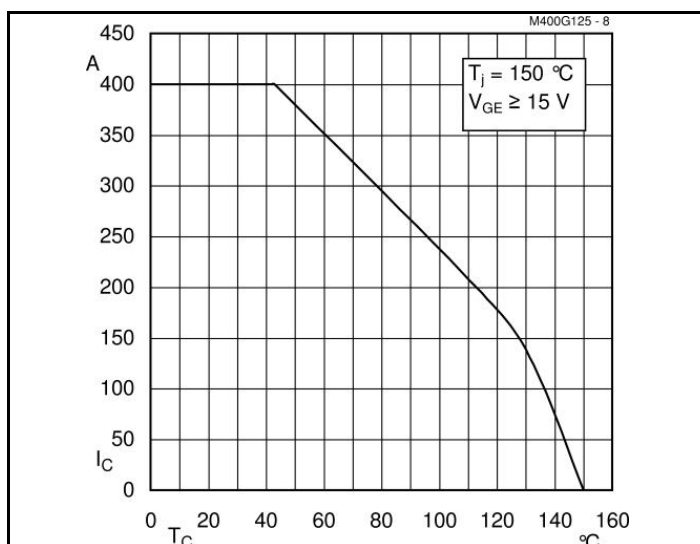


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

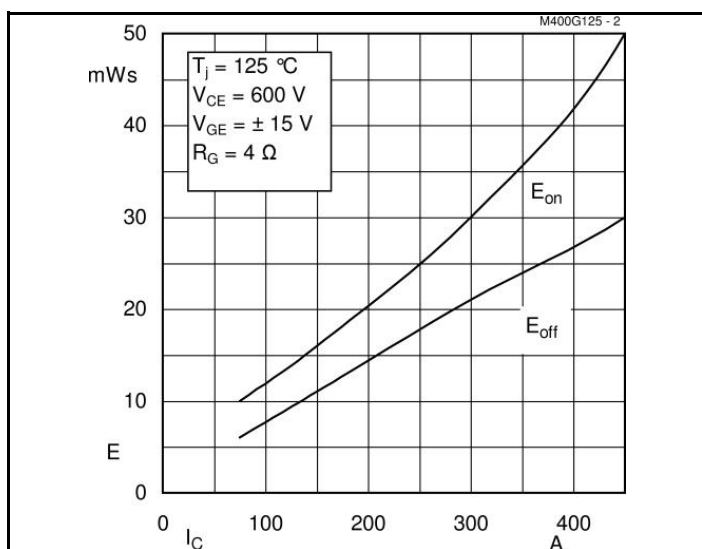


Fig. 3 Typ. turn-on /off energy = $f(I_C)$

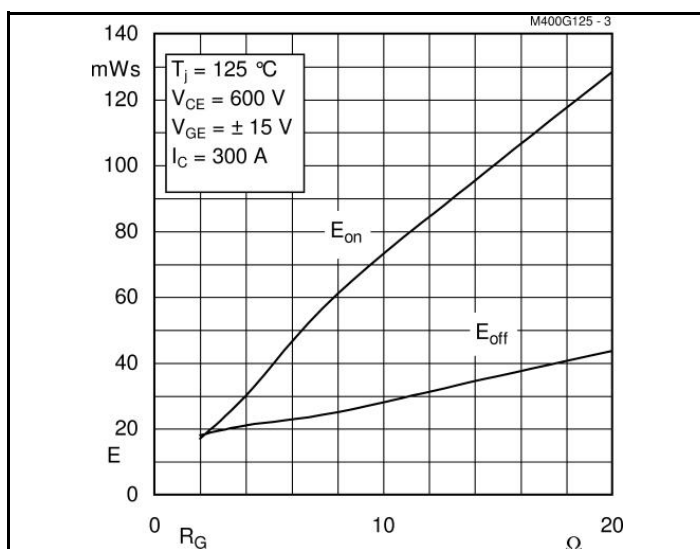


Fig. 4 Typ. turn-on /off energy = $f(R_G)$

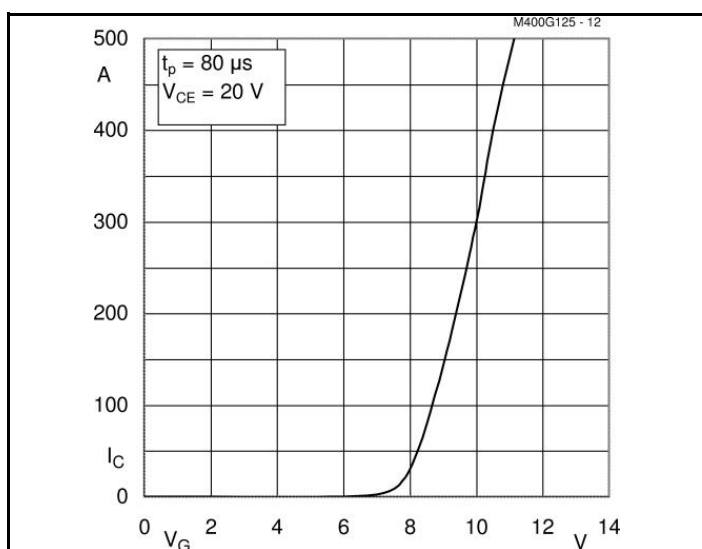


Fig. 5 Typ. transfer characteristic

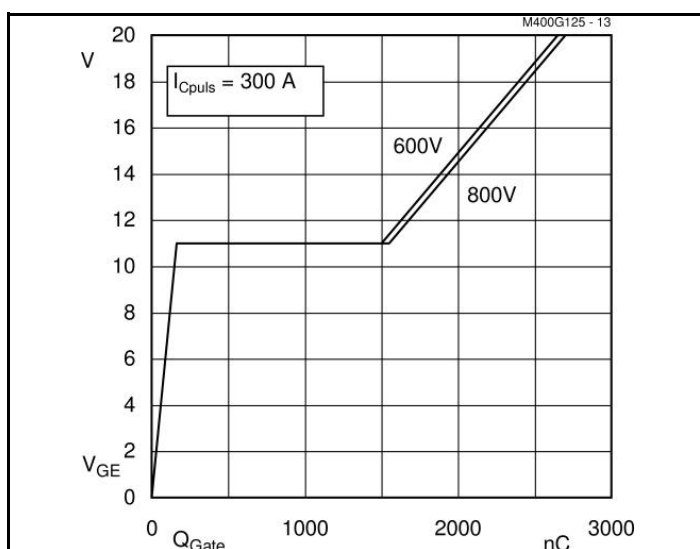
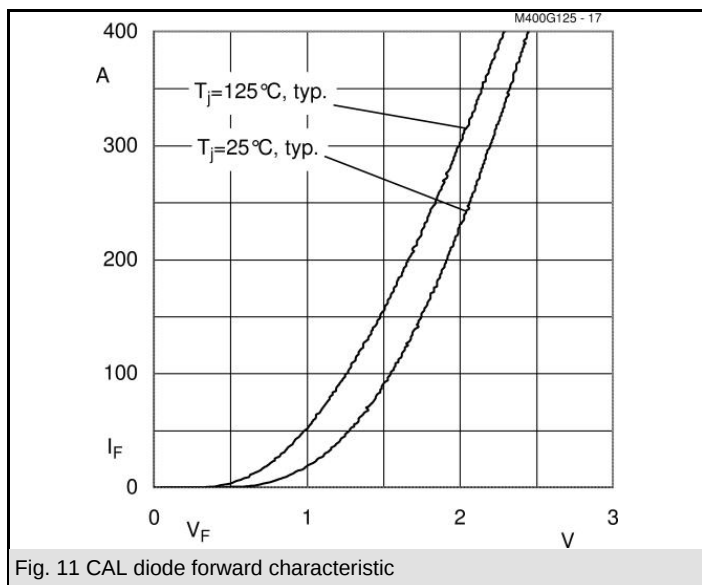
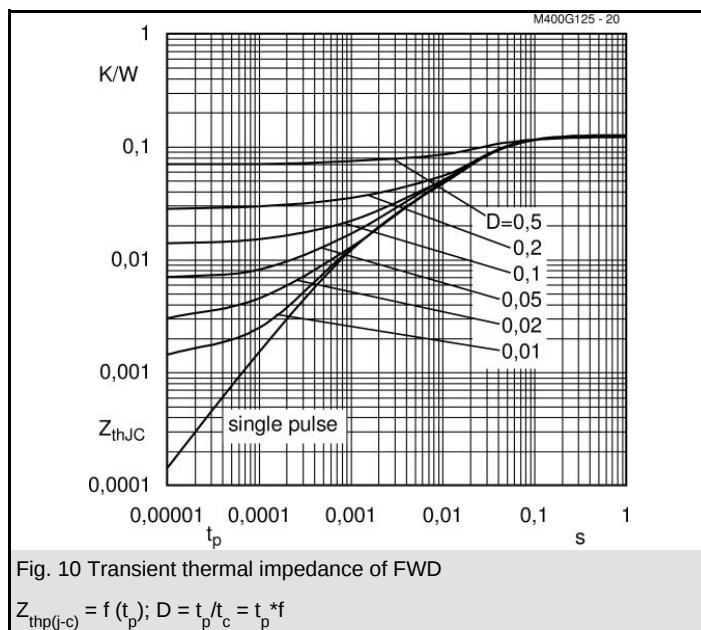
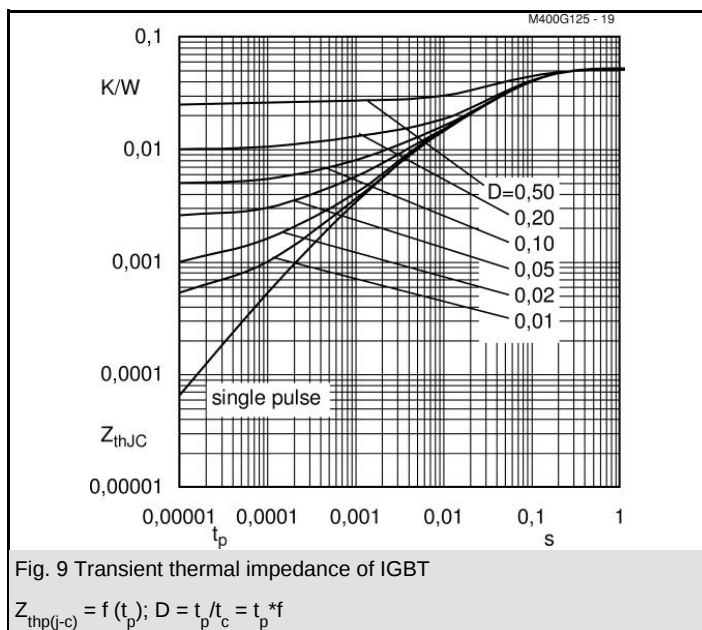
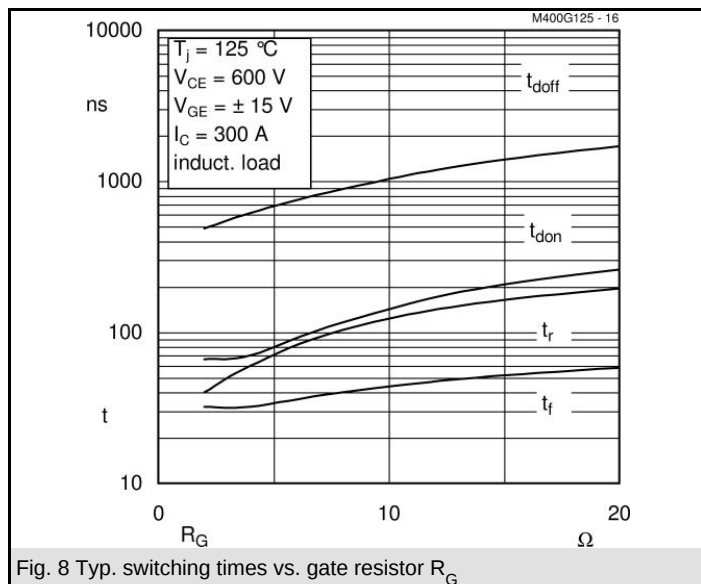
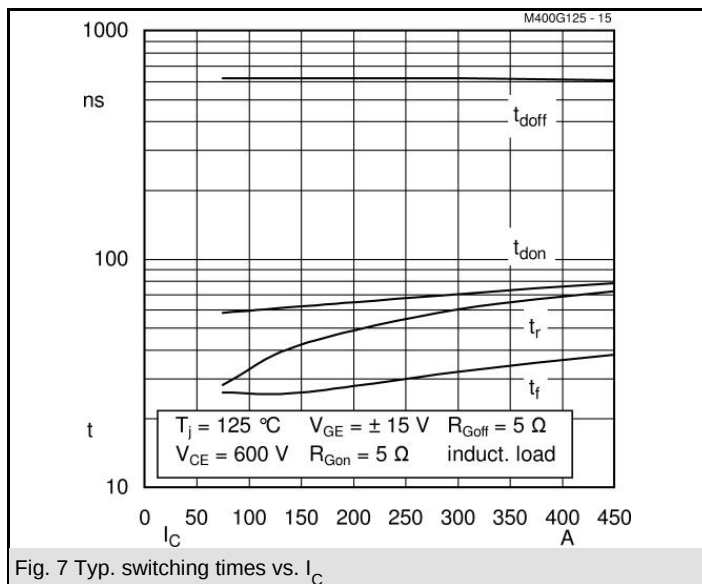


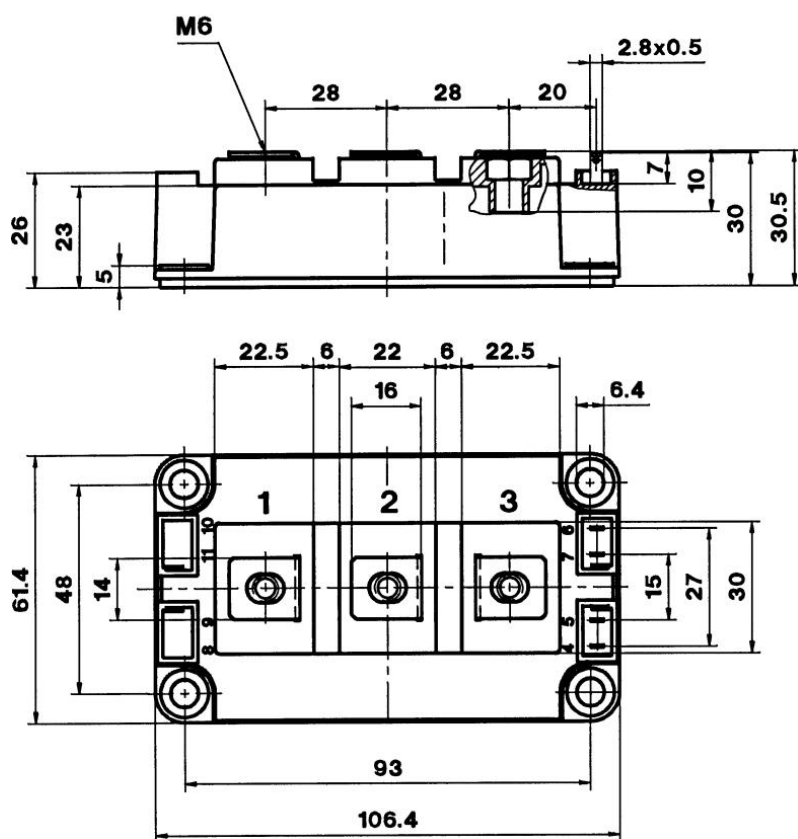
Fig. 6 Typ. gate charge characteristic



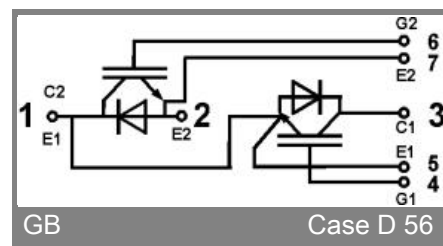
UL Recognized
File no. E 63 532

Dimensions in mm

CASED56

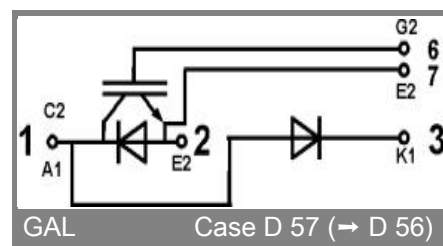


Case D 56



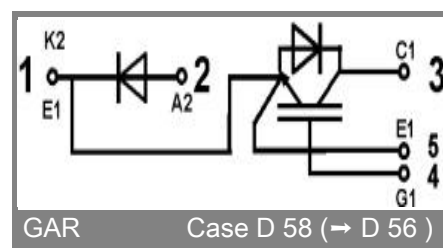
GB

Case D 56



GAL

Case D 57 (→ D 56)



GAR

Case D 58 (→ D 56)

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.