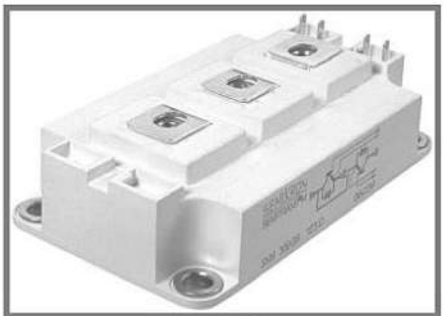
SKM 300GB125D



SEMITRANS® 3

Ultra Fast IGBT Module

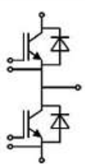
SKM 300GB125D

Features

- NPT - Non punch-through IGBT
- Low inductance case
- Short tail current with low temperature dependence
- High short circuit capability, self limiting
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (10 mm) and creepage distances (20 mm)

Typical Applications*

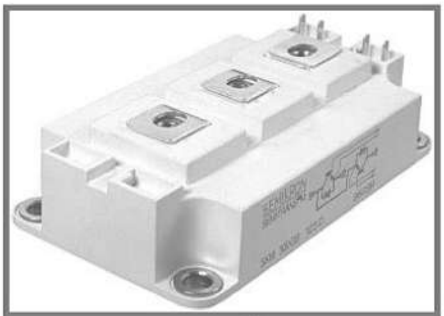
- Switched mode power supplies at f_{sw} > 20 kHz
- Resonant inverters up to 100 kHz
- Inductive heating
- UPS Uninterruptable power supplies at f_{sw} > 20 kHz
- Electronic welders at f_{sw} > 20 kHz



GB

Absolute Maximum Ratings	T_c = 25 °C, unless otherwise specified			
Symbol	**Conditions**		**Values**	**Units**
IGBT				
V_{CES}	T_j = 25 °C		1200	V
I_C	T_j = 150 °C	T_{case} = 25 °C	300	A
		T_{case} = 80 °C	210	A
I_{CRM}	I_{CRM}=2xI_{Cnom}		400	A
V_{GES}			± 20	V
t_{psc}	V_{CC} = 600 V; V_{GE} ≤ 20 V; V_{CES} < 1200 V	T_j = 125 °C	10	µs
Inverse Diode				
I_F	T_j = 150 °C	T_{case} = 25 °C	260	A
		T_{case} = 80 °C	180	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		400	A
I_{FSM}	t_p = 10 ms; sin.	T_j = 150 °C	1800	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			- 40...+ 150	°C
T_{stg}			- 40...+ 125	°C
V_{isol}	AC, 1 min.		4000	V

Characteristics	T_c = 25 °C, unless otherwise specified					
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
IGBT						
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 8 mA		4,5	5,5	6,5	V
I_{CES}	V_{GE} = 0 V, V_{CE} = V_{CES}	T_j = 25 °C		0,1	0,3	mA
V_{CE0}		T_j = 25 °C		1,5	1,75	V
		T_j = 125 °C		1,7		V
r_{CE}	V_{GE} = 15 V	T_j = 25°C		9	10,5	mΩ
		T_j = 125°C		11,5		mΩ
$V_{CE(sat)}$	I_{Cnom} = 200 A, V_{GE} = 15 V	T_j = °$C_{chiplev.}$		3,3	3,85	V
C_{ies}				18	24	nF
C_{oes}	V_{CE} = 25, V_{GE} = 0 V	f = 1 MHz		2,5	3,2	nF
C_{res}				1	1,3	nF
Q_G	V_{GE} = 0V - +20V			2000		nC
R_{Gint}	T_j = °C			2,5		Ω
$t_{d(on)}$		V_{CC} = 600V		130		ns
t_r	R_{Gon} = 3 Ω	I_C= 200A		40		ns
E_{on}		T_j = 125 °C		16		mJ
$t_{d(off)}$	R_{Goff} = 3 Ω	V_{GE} = ± 15V		460		ns
t_f				30		ns
E_{off}						mJ
$R_{th(j-c)}$	per IGBT				0,075	K/W



SEMITRANS® 3

Ultra Fast IGBT Module

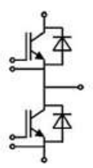
SKM 300GB125D

Features

- NPT - Non punch-through IGBT
- Low inductance case
- Short tail current with low temperature dependence
- High short circuit capability, self limiting
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (10 mm) and creepage distances (20 mm)

Typical Applications*

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



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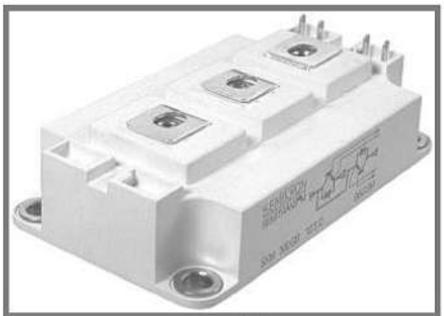
Characteristics						
Symbol	**Conditions**		**min.**	**typ.**	**max.**	**Units**
Inverse Diode						
$V_F = V_{EC}$	I_{Fnom} = 200 A; V_{GE} = 0 V	T_j = 25 °$C_{chiplev.}$		2	2,5	V
		T_j = 125 °$C_{chiplev.}$		1,8		V
V_{F0}		T_j = 25 °C		1,1	1,2	V
		T_j = 125 °C				V
r_F		T_j = 25 °C		4,5	6,5	mΩ
		T_j = 125 °C				mΩ
I_{RRM}	I_F = 200 A	T_j = 125 °C		340		A
Q_{rr}	di/dt = 8000 A/µs			46		µC
E_{rr}	V_{GE} = 0 V; V_{CC} = 600 V					mJ
$R_{th(j-c)D}$	per diode				0,18	K/W
Module						
L_{CE}				15	20	nH
$R_{CC'+EE'}$	res., terminal-chip	T_{case}= 25 °C		0,35		mΩ
		T_{case}= 125 °C		0,5		mΩ
$R_{th(c-s)}$	per module				0,038	K/W
M_s	to heat sink 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.

* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.



SEMITRANS® 3

Ultra Fast IGBT Module

SKM 300GB125D

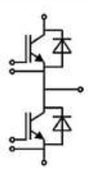
Z_{th} Symbol	Conditions	Values	Units
$Z_{th(j-c)I}$			
R_i	i = 1	53	mK/W
R_i	i = 2	18,5	mK/W
R_i	i = 3	3,1	mK/W
R_i	i = 4	0,4	mK/W
tau_i	i = 1	0,04	s
tau_i	i = 2	0,0189	s
tau_i	i = 3	0,0017	s
tau_i	i = 4	0,003	s
$Z_{th(j-c)D}$			
R_i	i = 1	115	mK/W
R_i	i = 2	52	mK/W
R_i	i = 3	11	mK/W
R_i	i = 4	2	mK/W
tau_i	i = 1	0,0366	s
tau_i	i = 2	0,0113	s
tau_i	i = 3	0,003	s
tau_i	i = 4	0,0002	s

Features

- NPT - Non punch-through IGBT
- Low inductance case
- Short tail current with low temperature dependence
- High short circuit capability, self limiting
- Fast & soft inverse CAL diodes
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (10 mm) and creepage distances (20 mm)

Typical Applications*

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



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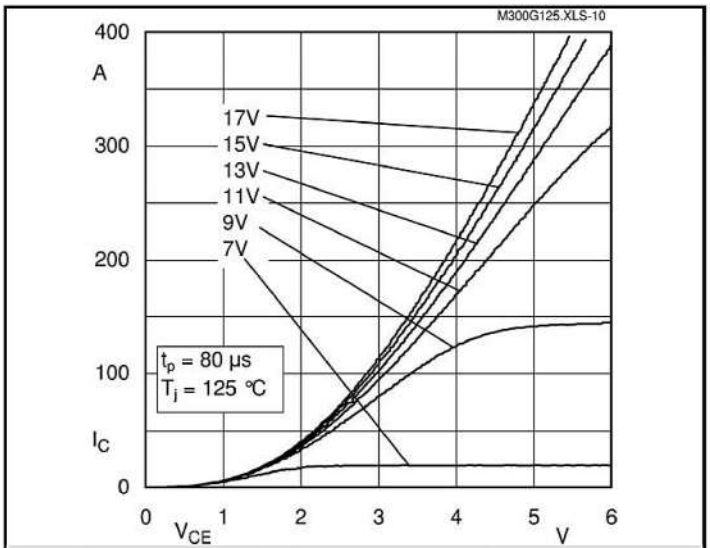


Fig. 1 Typ. output characteristic, t_p = 80 µs; 125 °C

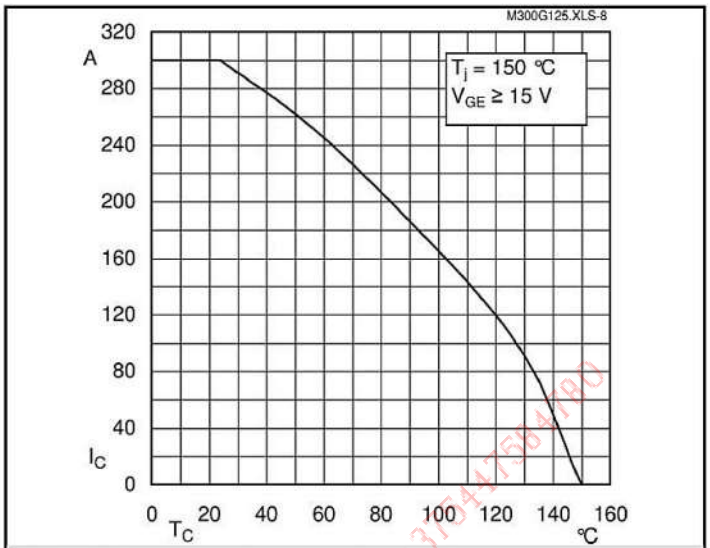


Fig. 2 Rated current vs. temperature $I_C = f(T_C)$

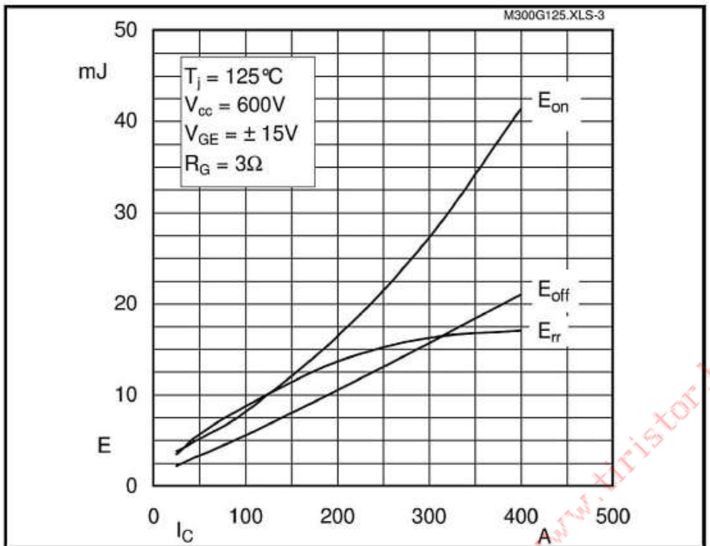


Fig. 3 Typ. turn-on /-off energy = f (I_C)

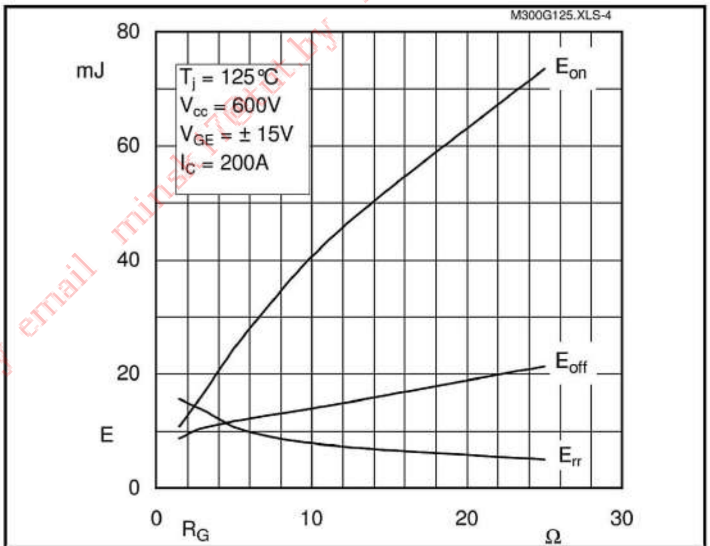


Fig. 4 Typ. turn-on /-off energy = f (R_G)

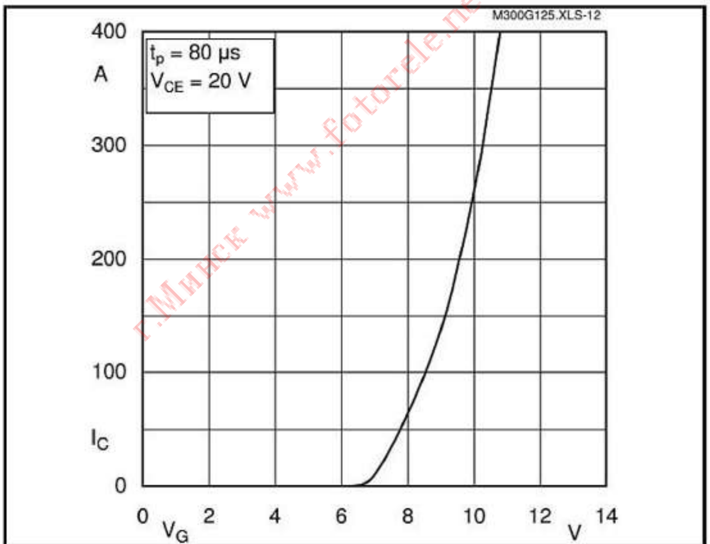


Fig. 5 Typ. transfer characteristic, t_p = 80 µs; V_{CE} = 20 V

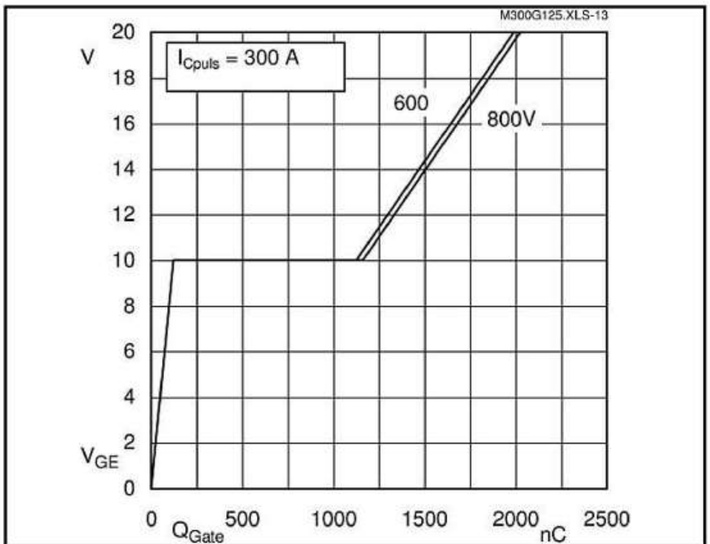


Fig. 6 Typ. gate charge characteristic

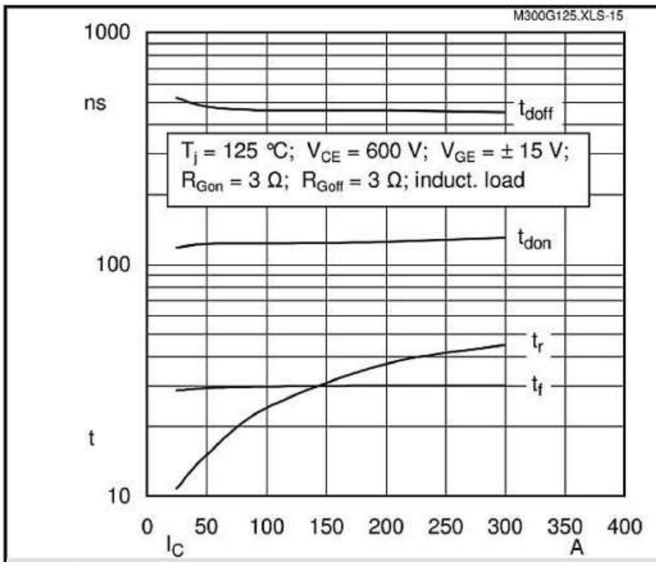


Fig. 7 Typ. switching times vs. I_C

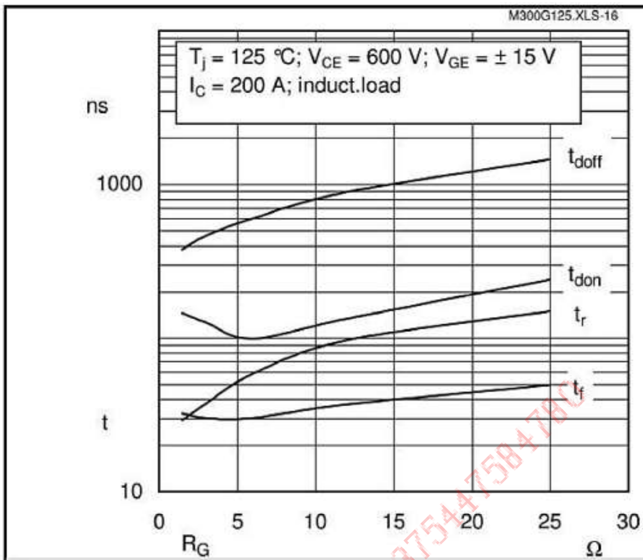


Fig. 8 Typ. switching times vs. gate resistor R_G

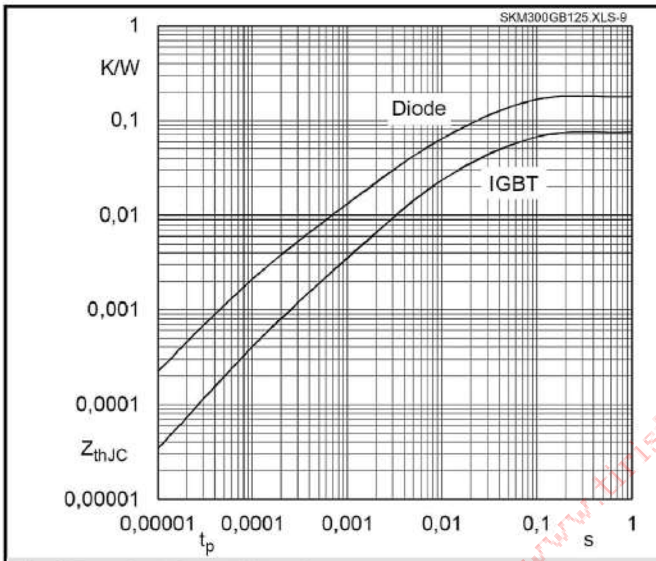


Fig. 9 Transient thermal impedance

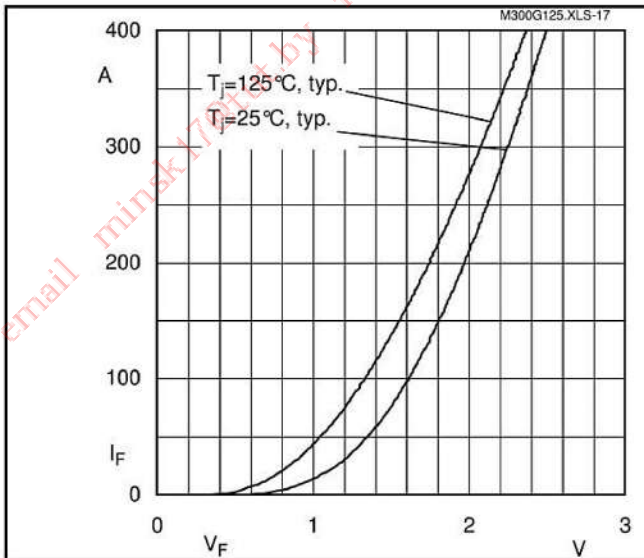


Fig. 10 CAL diode forward characteristic

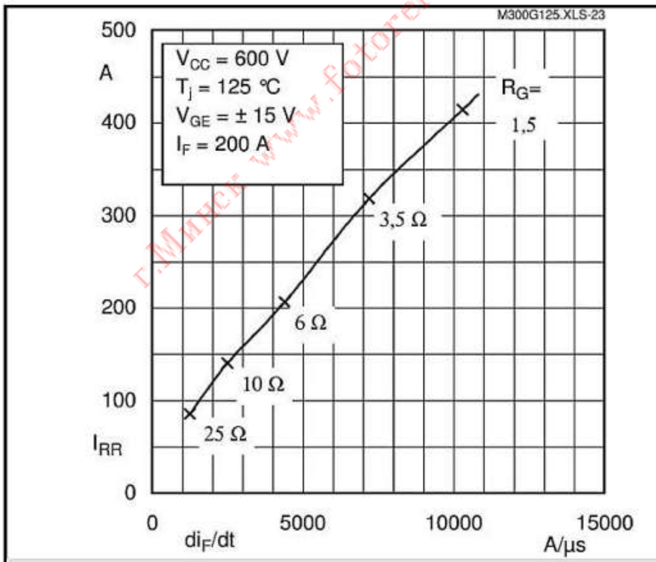


Fig. 11 Typ. CAL diode peak reverse recovery current

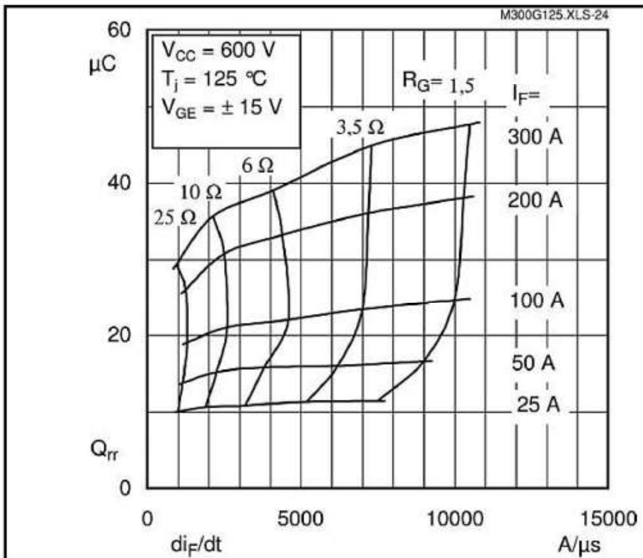
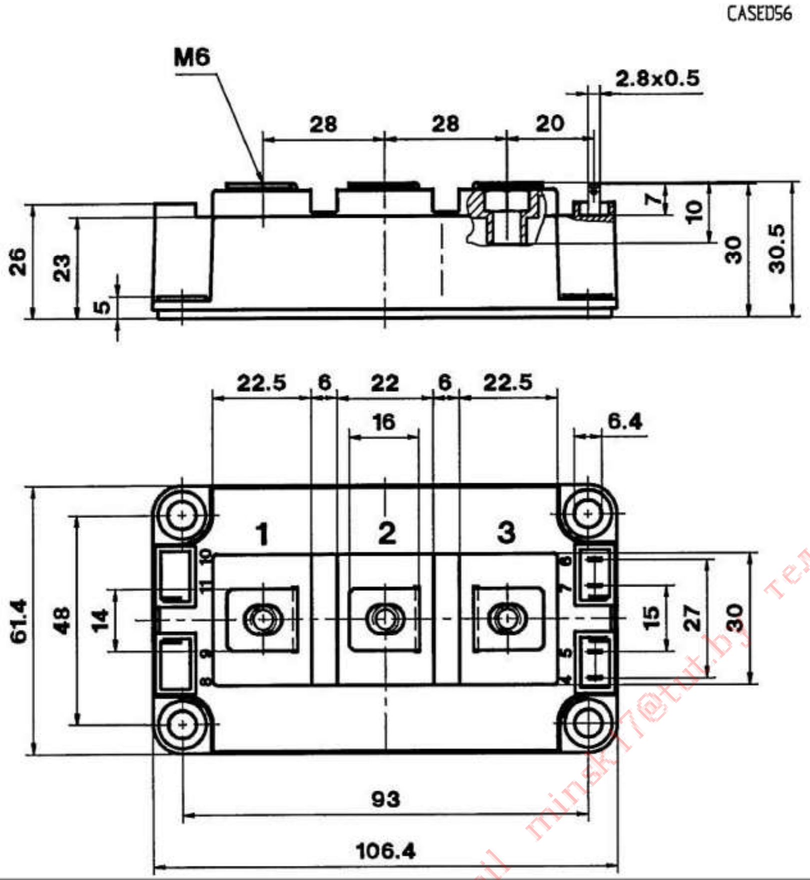
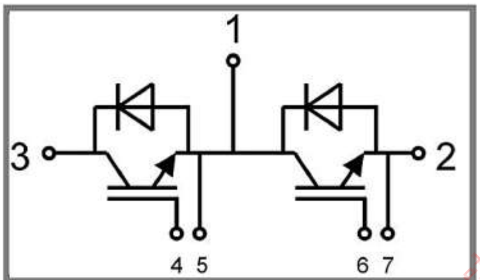


Fig. 12 Typ. CAL diode peak reverse recovery charge

UL Recognized File 63 532



Case D 56



GB Case D 56

SEMIKRON

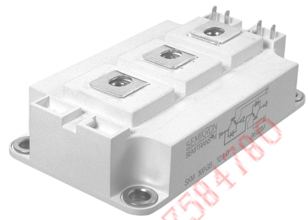
Absolute Maximum Ratings Symbol	Conditions [1]	Values	Units
V_{CES}		1200	V
V_{CGR}	R_{GE} = 20 kΩ	1200	V
I_C	T_{case} = 25/80 °C	300 / 210	A
I_{CM}	T_{case} = 25/80 °C; t_p = 1 ms	600 / 420	A
V_{GES}		± 20	V
P_{tot}	per IGBT, T_{case} = 25 °C	1660	W
T_j, (T_{stg})		–40 ... +150 (125)	°C
V_{isol}	AC, 1 min.	2500	V
humidity	IEC 60721-3-3		
climate	DIN IEC 68 T.1	40/125/56	
Inverse Diode			
$I_F = -I_C$	T_{case} = 25/80 °C	260 / 180	A
$I_{FM} = -I_{CM}$	T_{case} = 25/80 °C; t_p = 1 ms	600 / 420	A
I_{FSM}	t_p = 10 ms; sin.; T_j = 150 °C	2200	A
I^2t	t_p = 10 ms; T_j = 150 °C	24200	A^2s

Characteristics Symbol	Conditions [1]	min.	typ.	max.	Units
$V_{(BR)CES}$	V_{GE} = 0, I_C = 4 mA	≥ V_{CES}			V
$V_{GE(th)}$	$V_{GE} = V_{CE}$, I_C = 8 mA	4,5	5,5	6,5	V
I_{CES}	V_{GE} = 0, $V_{CE} = V_{CES}$; T_j = 25 °C		3	4,5	mA
	T_j = 125 °C		15		mA
I_{GES}	V_{GE} = 20 V, V_{CE} = 0			0,4	µA
V_{CEsat}	I_C = 200 A; V_{GE} = 15 V; T_j = 25 °C		3,3	3,85	V
V_{CEsat}	I_C = 300 A		3,8		V
g_{fs}	V_{CE} = 20 V, I_C = 200 A	108	150		S
C_{CHC}	per IGBT			700	pF
C_{ies}	V_{GE} = 0, V_{CE} = 25 V, f = 1 MHz		18	24	nF
C_{oes}			2,5	3,2	nF
C_{res}			1,0	1,3	nF
L_{CE}				20	nH
$t_{d(on)}$	V_{CC} = 600 V, V_{GE} = –15 V / +15 V[3], I_C = 200 A, ind. load, $R_{Gon} = R_{Goff}$ = 3 Ω, T_j = 125 °C		130		ns
t_r			40		ns
$t_{d(off)}$			460		ns
t_f			30		ns
E_{on} [5]			16		mWs
E_{off} [5]			11		mWs
Inverse Diode [8]					
$V_F = V_{EC}$	I_F = 200 A; V_{GE} = 0 V; T_j = 25 (125) °C		2,0(1,8)	2,5	V
$V_F = V_{EC}$	I_F = 300 A		2,25(2,1)		V
V_{TO}	T_j = 125 °C		1,1	1,2	V
r_t	T_j = 125 °C		3	5,5	mΩ
I_{RRM}	I_F = 200 A; T_j = 25 (125) °C[2]		70(105)		A
Q_{rr}	I_F = 200 A; T_j = 25 (125) °C[2]		10(26)		µC
Thermal characteristics					
R_{thjc}	per IGBT			0,075	°C/W
R_{thjc}	per diode			0,18	°C/W
R_{thch}	per module			0,038	°C/W

SEMITRANS® M Superfast IGBT Modules

SKM 300 GB 125 D

Preliminary Data



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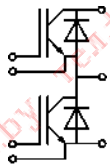


GB

Features

- N channel, homogeneous Silicon structure (NPT-Non punch-through IGBT)
- Low inductance case
- **Short tail** current with low temperature dependence
- High short circuit capability, self limiting
- Fast & soft inverse CAL diodes [8]
- Isolated copper baseplate using DCB Direct Copper Bonding Technology
- Large clearance (12 mm) and creepage distances (20 mm)

Typical Applications

- Switching (not for linear use)
- Switched mode power supplies at f_{sw} > 20 kHz
- Resonant inverters up to 100 kHz
- Silent AC motor speed control (elevators)
- Inductive heating
- Silent UPS Uninterruptable power supplies at f_{sw} > 20 kHz
- Electronic (also portable) welders at f_{sw} > 20 kHz

[1] T_{case} = 25 °C, unless otherwise specified
[2] $I_F = -I_C$, V_R = 600 V, $-di_F/dt$ = 2000 A/µs, V_{GE} = 0 V
[3] Use V_{GEoff} = – 5 ... – 15 V
[5] See fig. 2 + 3; R_{Goff} = 3 Ω
[8] CAL = Controlled Axial Lifetime Technology

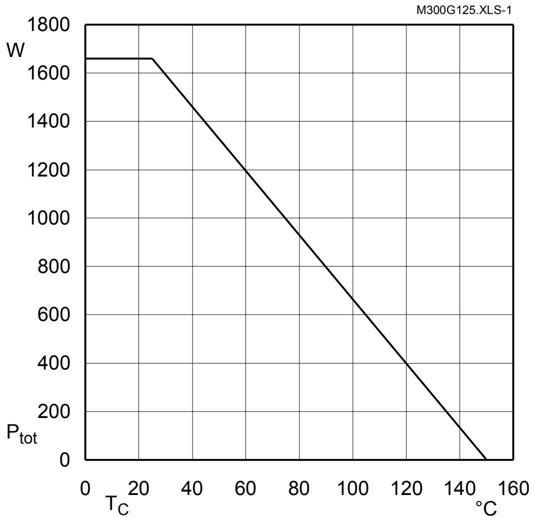


Fig. 1 Rated power dissipation $P_{tot} = f(T_C)$

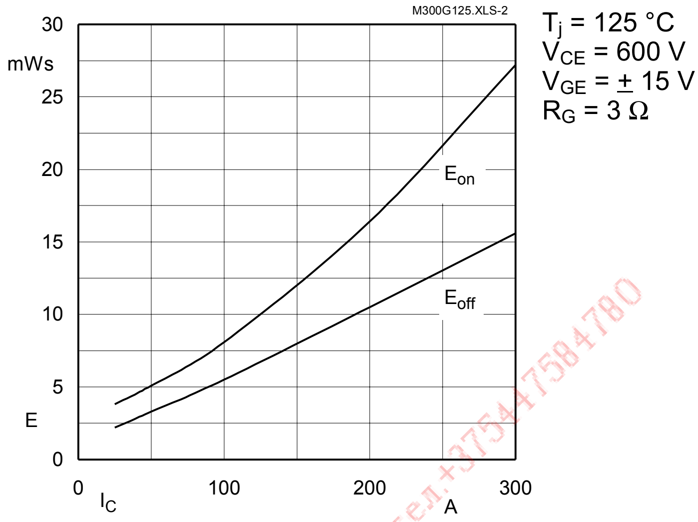


Fig. 2 Turn-on /-off energy = f (I_C)

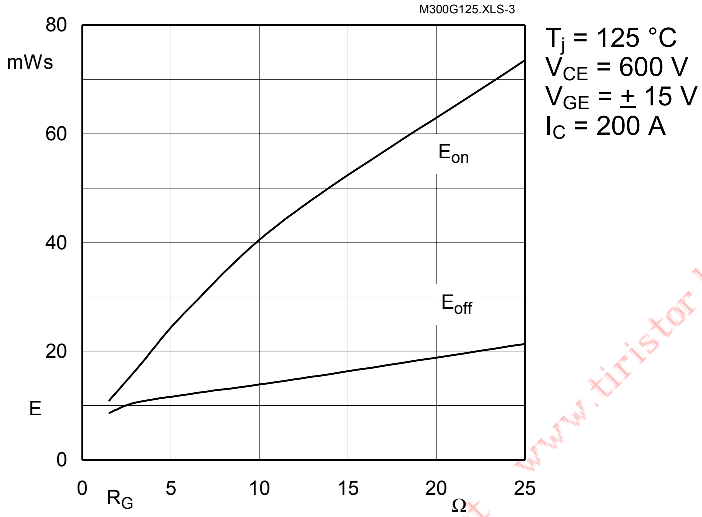


Fig. 3 Turn-on /-off energy = f (R_G)

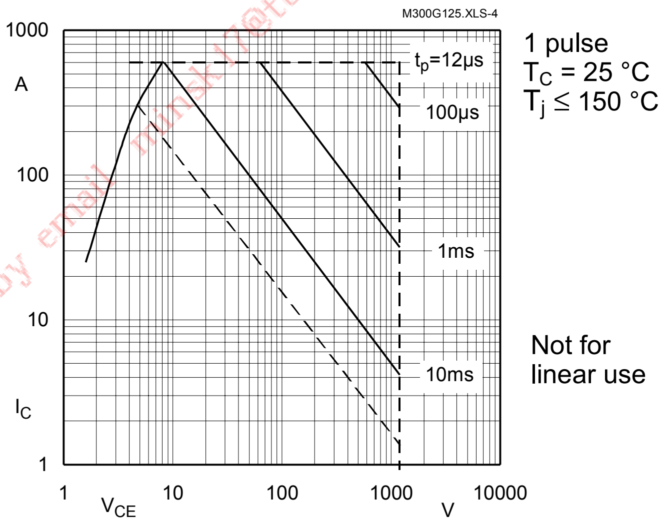


Fig. 4 Maximum safe operating area (SOA) $I_C = f(V_{CE})$

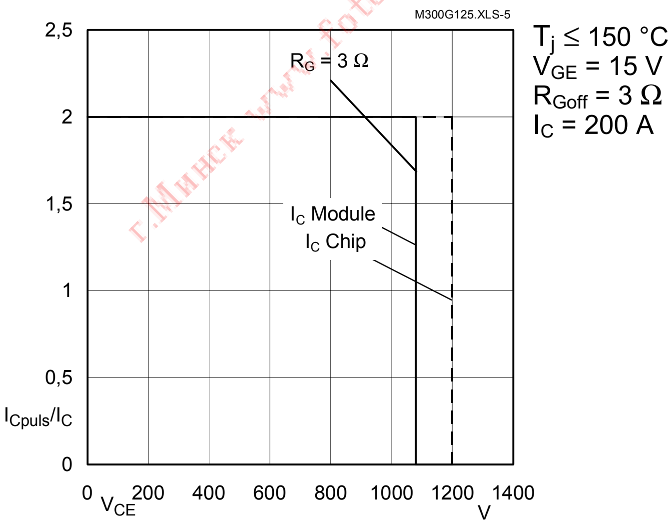


Fig. 5 Turn-off safe operating area (RBSOA)

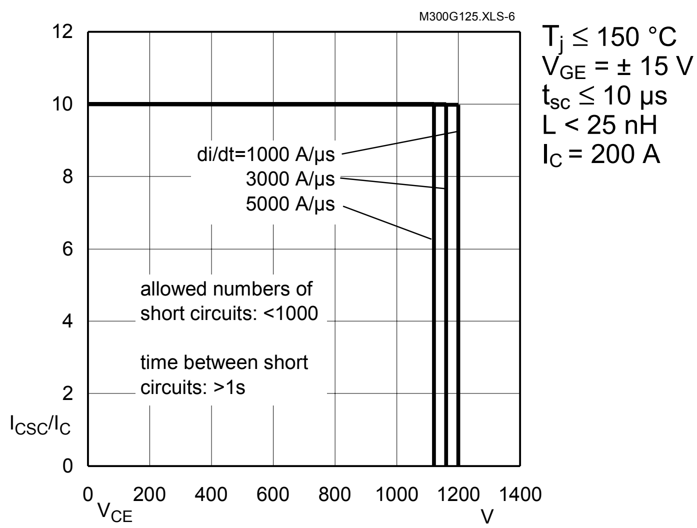


Fig. 6 Safe operating area at short circuit $I_C = f(V_{CE})$

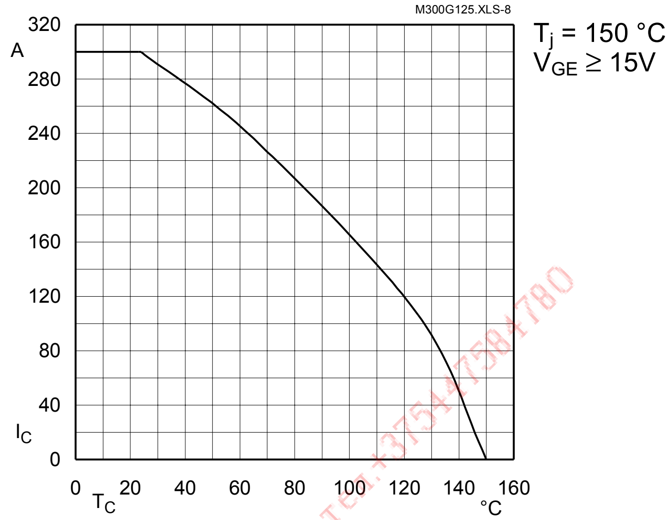


Fig. 8 Rated current vs. temperature $I_C = f(T_C)$

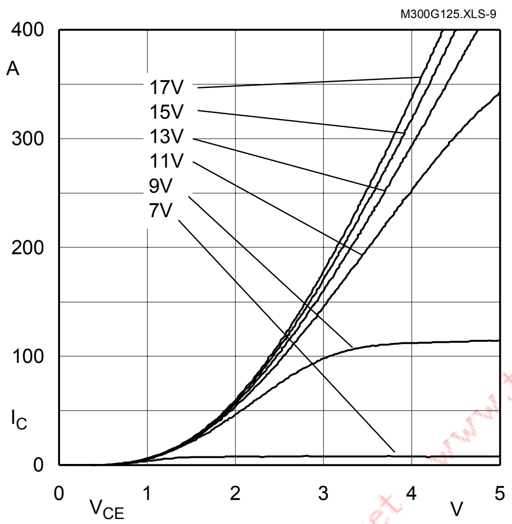


Fig. 9 Typ. output characteristic, t_p = 80 µs; 25 °C

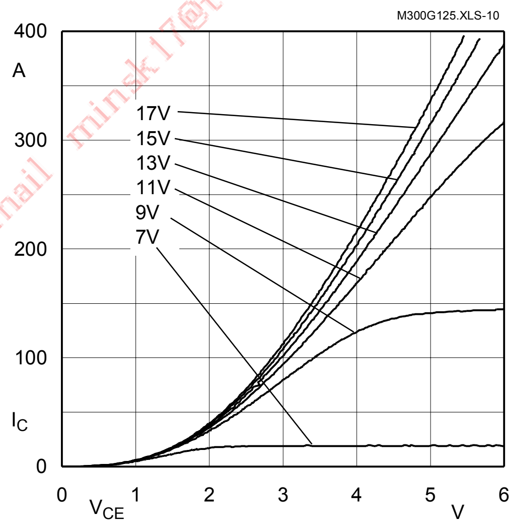


Fig. 10 Typ. output characteristic, t_p = 80 µs; 125 °C

$P_{cond(t)} = V_{CEsat(t)} \cdot I_{C(t)}$

$V_{CEsat(t)} = V_{CE(TO)(Tj)} + r_{CE(Tj)} \cdot I_{C(t)}$

$V_{CE(TO)(Tj)} \leq 1{,}4 + 0{,}003\ (T_j - 25)$ [V]

typ.: $r_{CE(Tj)} = 0{,}0091 + 0{,}000022\ (T_j - 25)$ [Ω]

max.: $r_{CE(Tj)} = 0{,}0107 + 0{,}000018\ (T_j - 25)$ [Ω]

valid for $V_{GE} = +\ 15^{+2}_{-1}$ [V]; $I_C \geq 0{,}3\ I_{Cnom}$

Fig. 11 Saturation characteristic (IGBT)
Calculation elements and equations

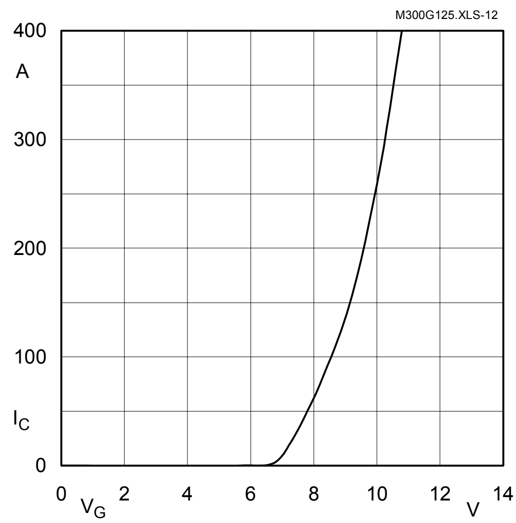
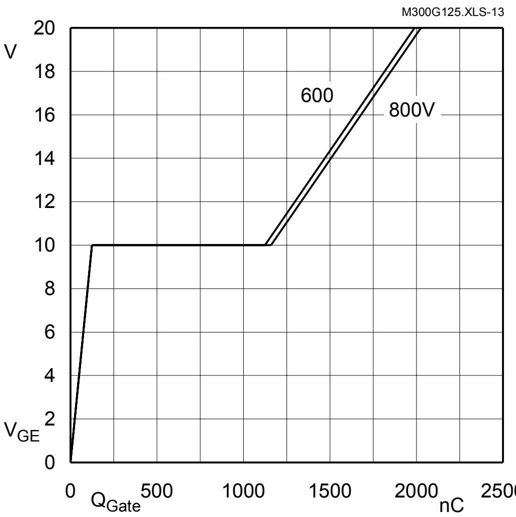
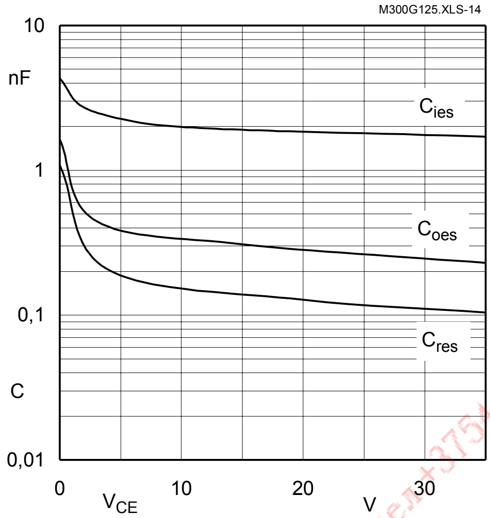


Fig. 12 Typ. transfer characteristic, t_p = 80 µs; V_{CE} = 20 V



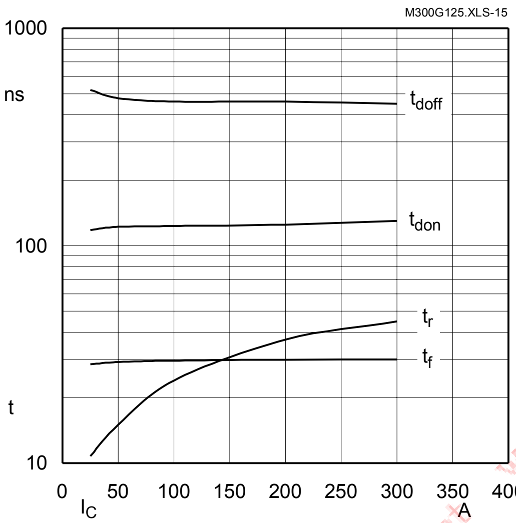
I_{Cpuls} = 300 A

Fig. 13 Typ. gate charge characteristic



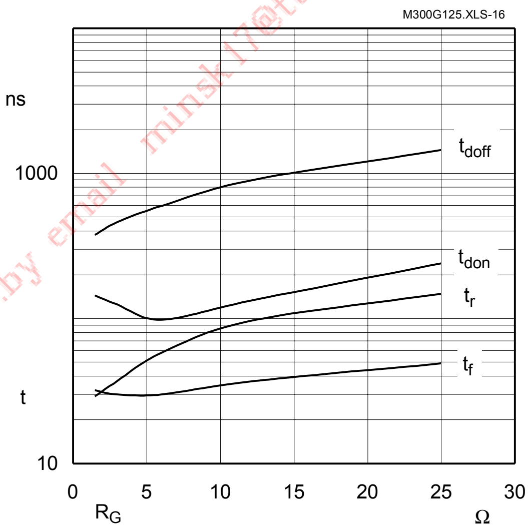
V_{GE} = 0 V
f = 1 MHz

Fig. 14 Typ. capacitances vs.V_{CE}



T_j = 125 °C
V_{CE} = 600 V
V_{GE} = ± 15 V
R_{Gon} = 3 Ω
R_{Goff} = 3 Ω
induct. load

Fig. 15 Typ. switching times vs. I_C



T_j = 125 °C
V_{CE} = 600 V
V_{GE} = ± 15 V
I_C = 200 A
induct. load

Fig. 16 Typ. switching times vs. gate resistor R_G

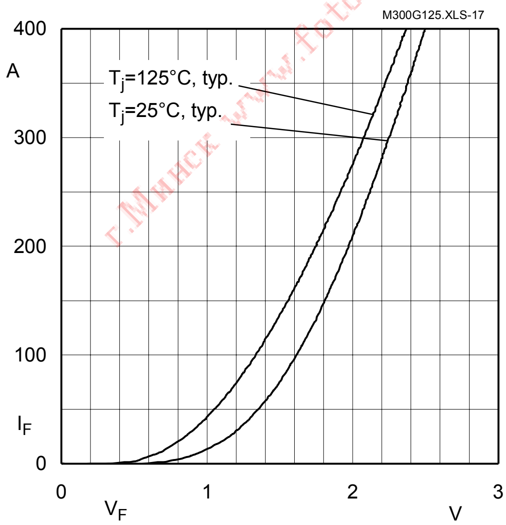
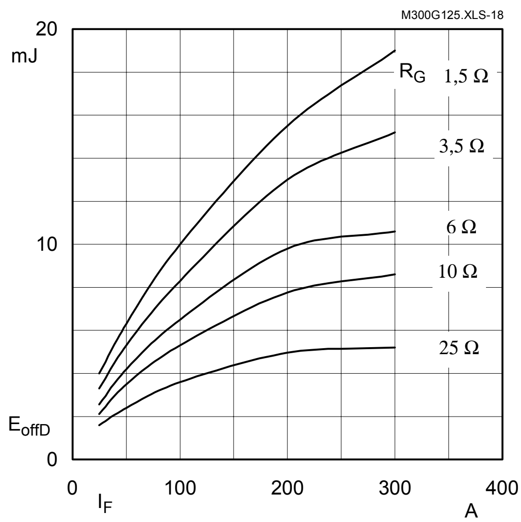


Fig. 17 Typ. CAL diode forward characteristic



V_{CC} = 600 V
T_j = 125 °C
V_{GE} = ± 15 V

Fig. 18 Diode turn-off energy dissipation per pulse

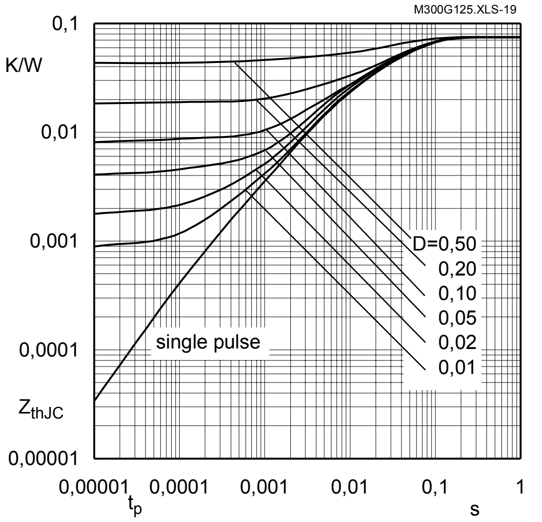


Fig. 19 Transient thermal impedance of IGBT
$Z_{thJC} = f\ (t_p)$; $D = t_p / t_c = t_p \cdot f$

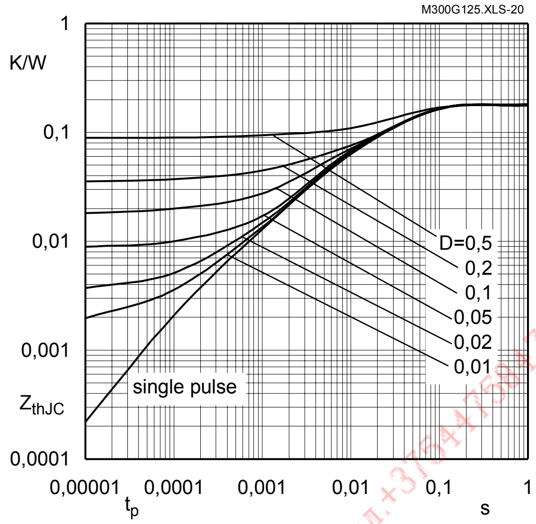


Fig. 20 Transient thermal impedance of inverse CAL diodes $Z_{thJC} = f\ (t_p)$; $D = t_p / t_c = t_p \cdot f$

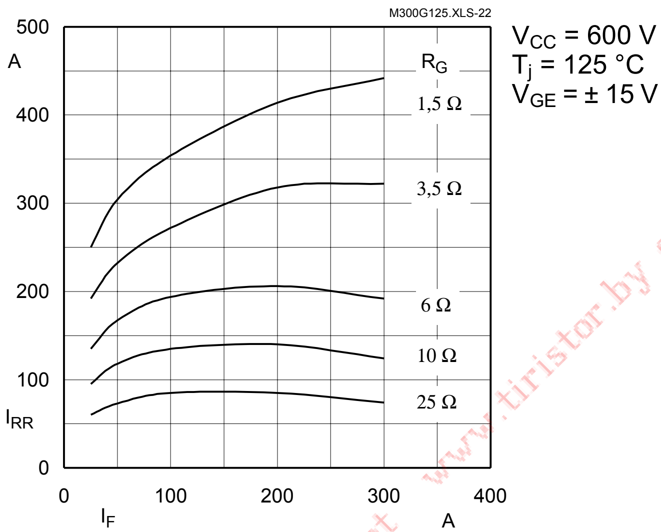


Fig. 22 Typ. CAL diode peak reverse recovery current $I_{RR} = f\ (I_F; R_G)$

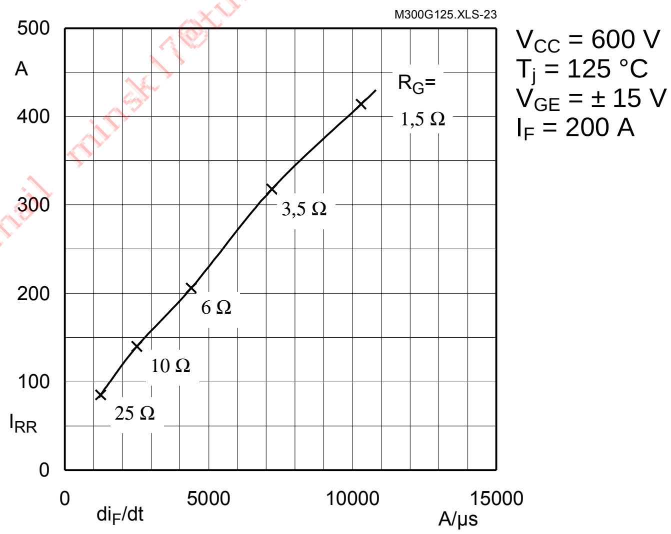


Fig. 23 Typ. CAL diode peak reverse recovery current $I_{RR} = f\ (di_F/dt; R_G)$

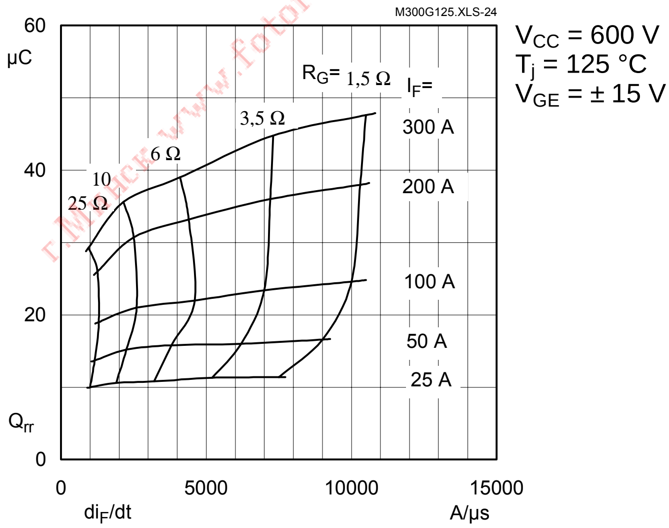


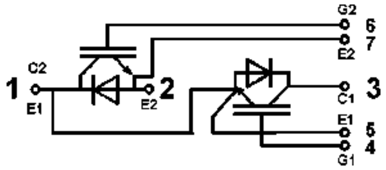
Fig. 24 Typ. CAL diode recovered charge
$Q_{RR} = f\ (di_F/dt; I_F; R_G)$

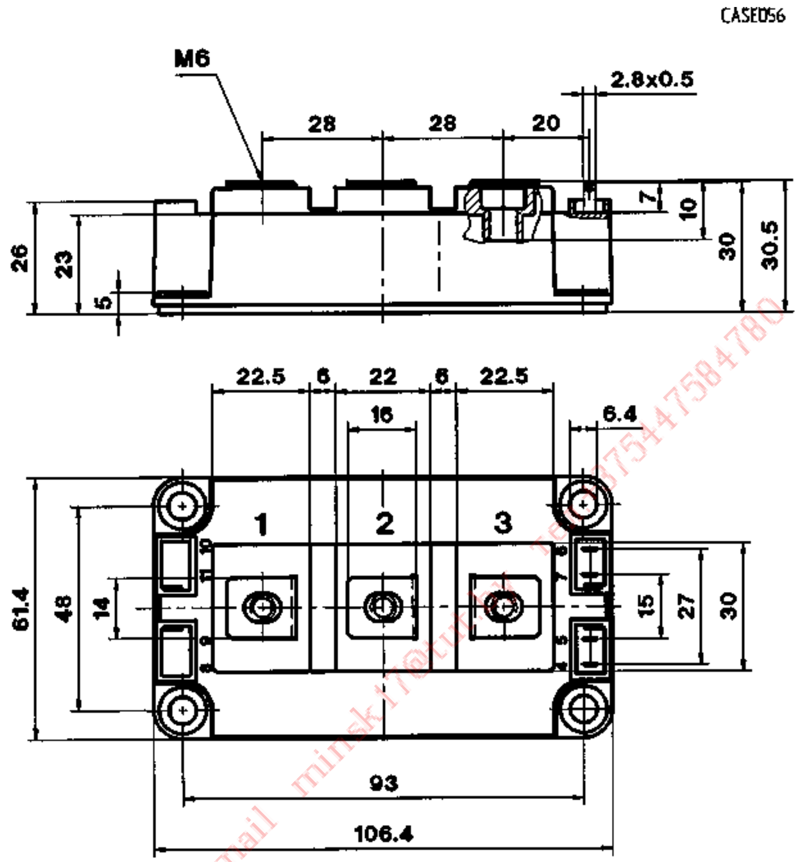
SEMITRANS 3

Case D 56

UL Recognized
File no. E 63 532

SKM 300 GB 125 D





Dimensions in mm

Case outline and circuit diagram

Mechanical Data						
Symbol	**Conditions**		**Values**			**Units**
			min.	**typ.**	**max.**	
M_1	to heatsink, SI Units	(M6)	3	–	5	Nm
	to heatsink, US Units		27	–	44	lb.in.
M_2	for terminals, SI Units	(M6)	2,5	–	5	Nm
	for terminals, US Units		22	–	44	lb.in.
a			–	–	5x9,81	m/s^2
w			–	–	325	g

This is an electrostatic discharge sensitive device (ESDS). Please observe the international standard IEC 747-1, Chapter IX.

12 devices are supplied in one SEMIBOX D without mounting hardware, which can be ordered separately under Ident No. 33321100 (for 10 SEMITRANS 3).

КАТАЛОГ SEMIKRON 2017/2018 МИНСК

модуль semikron, igbt, мост диодный

купить, продажа

MiniSKiiP

SEMITOP

SEMITRANS

SEMIX

SKIM

Full SiC

Hybrid SiC

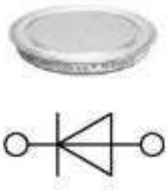
SKiiP

SEMIPACK

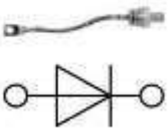
SEMITOP

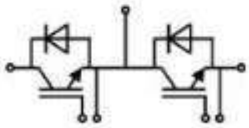
SEMIX

SEMISTART



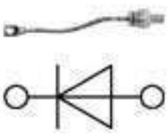
Power Bridge Rectifiers





SEMISTACK Classics

SEMIPONT



SEMIX

SEMITEACH

PT 22b3 RoHS

Pulse Transformer

Part Number: 97492890
Manufacturer: SEMIKRON
datasheet

Product Details >>

Current delivery time approx. 10 weeks

Axial fan 230V 119x38m 150m3/h

Fan

V 230 V

Part Number: 30031061
Manufacturer: SEMIKRON
datasheet

Thermal paste P12

Thermal paste

Part Number: 31867700
Manufacturer: SEMIKRON
datasheet

SKM300GB125D

Ультрабыстродействующие IGBT- модули SEMITRANS 3

на напряжение 1200В

Описание модулей SKM400GB125D, SKM400GAL125D, SKM400GAR125D

каталог, описание, технические, характеристики, datasheet, параметры, маркировка,габариты, фото, даташит,