SEMIKRON

Absolute Maximum Ratings

T_h = 25 °C, unless otherwise specified

Symbol	Conditions	Values	Units
IGBT			
V_{CES}		600	V
I_C	T_S = 25 (70) °C	525 (400)	A
I_{CRM}	T_S = 25 (70) °C, t_p =1 ms	1050 (800)	A
V_{GES}		± 20	V
T_j, (T_{stg})	$T_{OPERATION} \leq T_{stg}$	– 40 ... +150 (125)	°C
V_{isol}	AC, 1 min.	2500	V
Inverse Diode			
$I_{FAV} = -I_C$	T_S = 25 (70) °C	485 (370)	A
$I_{FRM} = -I_{CM}$	T_S = 25 (70) °C, t_p < 1 ms	970 (740)	A
I_{FSM}	t_p = 10 ms; sin.; T_j = 150 °C	54450	A

Characteristics

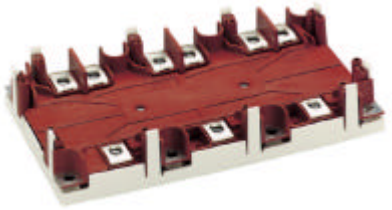
T_h = 25 °C, unless otherwise specified

Symbol	Conditions	min.	typ.	max.	Units
IGBT					
$V_{GE(TO)}$	$V_{GE} = V_{CE}$, 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		0,4 (24)		mA
$V_{CE(TO)}$			0,9 (0,8)	1,0	V
r_{CE}	V_{GE} = 15 V, T_j = 25 (125) °C		2,0 (2,9)	2,7	mΩ
$V_{CE(sat)}$	I_C = 300 A, V_{GE} = 15 V, T_j = 25 (125) °C on chip level		1,5 (1,7)	1,8	V
C_{ies}			35		nF
C_{oes}	V_{GE} = 0, V_{CE} = 25 V, f = 1 MHz		3,75		nF
C_{res}			2,25		nF
L_{CE}				20	nH
$R_{CC'+EE'}$	resistance, terminal-chip 25 (125) °C		0,9 (1,1)		mΩ
$t_{d(on)}$	V_{CC} = 300 V		140		ns
t_r	I_C = 300 A		110		ns
$t_{d(off)}$	$R_{Gon} = R_{Goff}$ = 6,2 Ω		750		ns
t_f	T_j = 125 °C		64		ns
E_{on}	V_{GE} ± 15 V		11		mJ
E_{off}			17		mJ
Inverse Diode					
$V_F = V_{EC}$	I_F = 300 A; V_{GE} = 0 V; T_j = 25 (125) °C on chip level		1,25 (1,2)	1,5	V
V_{TO}	T_j = 25 (125) °C		(0,85)	(0,9)	V
r_T	T_j = 25 (125) °C		(1,33)	(2,0)	mΩ
I_{rrm}	I_F = 300 A; T_j = 125 °C		230		A
Q_{rr}	V_{GE} = 0 V		28		µC
E_{rr}	$R_{Gon} = R_{Goff}$ = 6,2 Ω		5,2		mJ
Thermal Characteristics					
R_{thjh}	per IGBT			0,09	K/W
R_{thjh}	per FWD			0,125	K/W
Temperature Sensor					
R_{TS}	T = 25 °C / 100 °C		1,0 / 1,67		kΩ
tolerance	T = 25 °C / 100 °C		3,0 / 2,0		%
Mechanical Data					
M_1	to heatsink (M5)	2		3	Nm
M_2	for terminals (M6)	4		5	Nm
w				325	g

SKiM® 5
IGBT Module

SKiM 500 GD 063 DM

Preliminary Data



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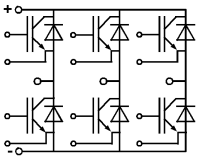


GD

Features

- NPT-IGBT with positive temperature coefficient of V_{CEsat}
- Short circuit, self limiting to 6 x I_C
- Corresponds to standards IEC 60721-3-3 (humidity) class 3K7/IE32 and IEC 68T.1 (climate) 40/125/56

Typical Applications

- Resonant inverters up to 100kHz
- Inductive heating
- Electronic welders at f_{sw} > 20kHz

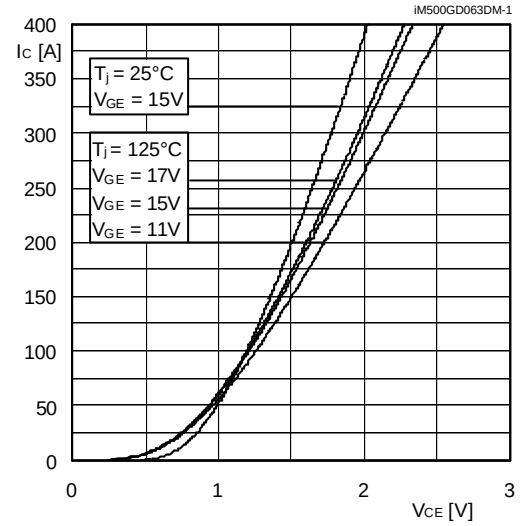


Fig. 1 Typ. output characteristic, inclusive $R_{CC'+EE'}$

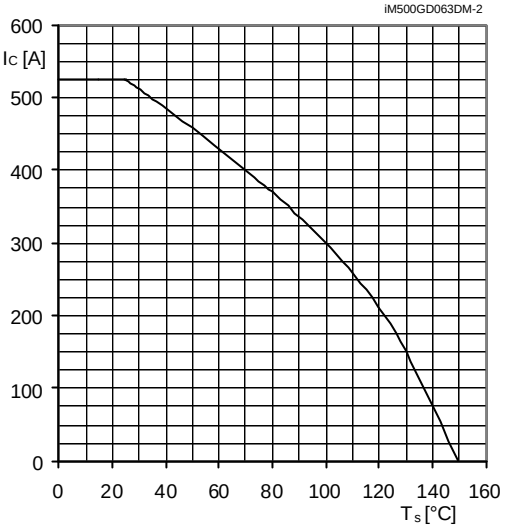


Fig. 2 Rated current vs. temperature $I_C = f(T_S)$

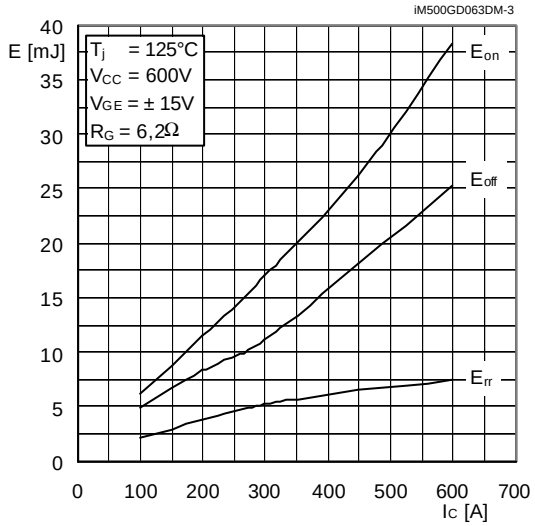


Fig. 3 Typ. turn-on /-off energy = f (I_C)

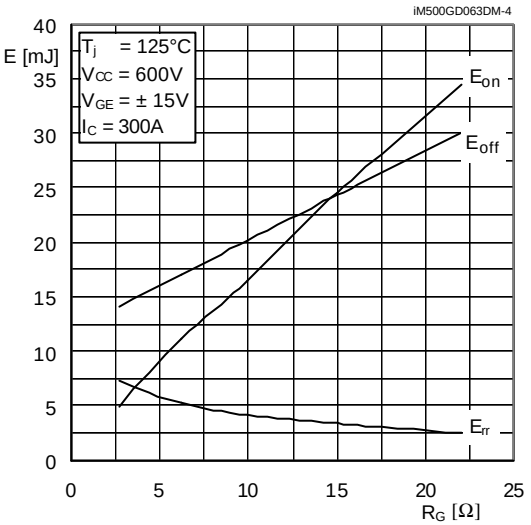


Fig. 4 Typ. turn-on /-off energy = f (R_G)

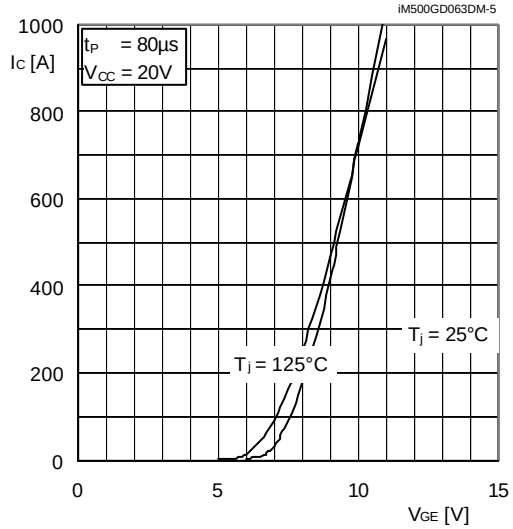


Fig. 5 Typ. transfer characteristic

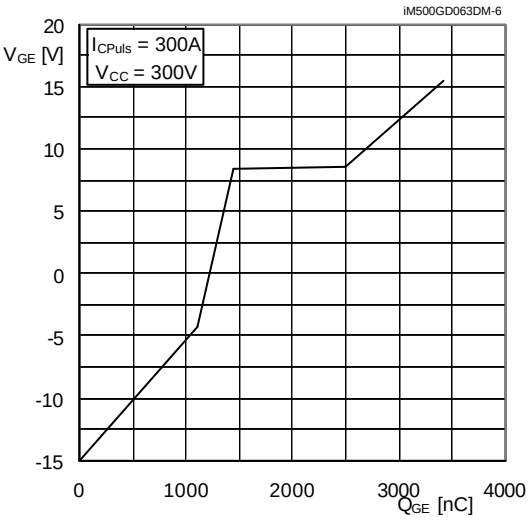


Fig. 6 Typ. gate charge characteristic

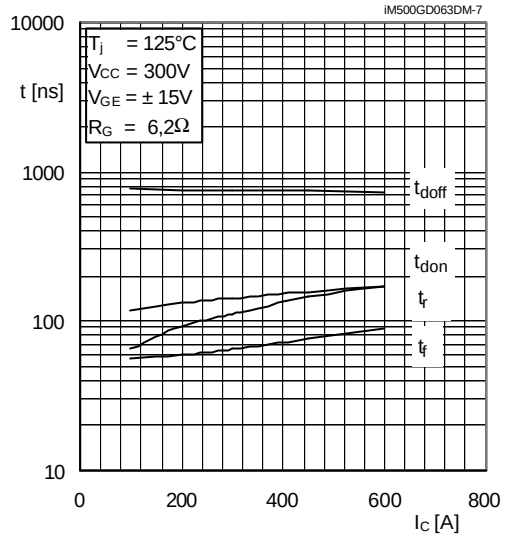


Fig. 7 Typ. switching times vs. I_C

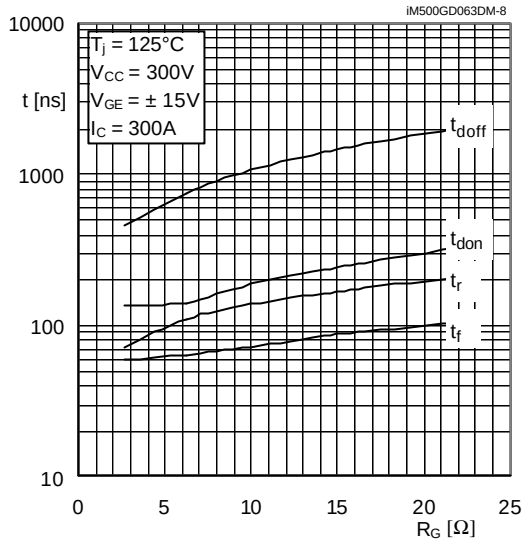


Fig. 8 Typ. switching times vs. gate

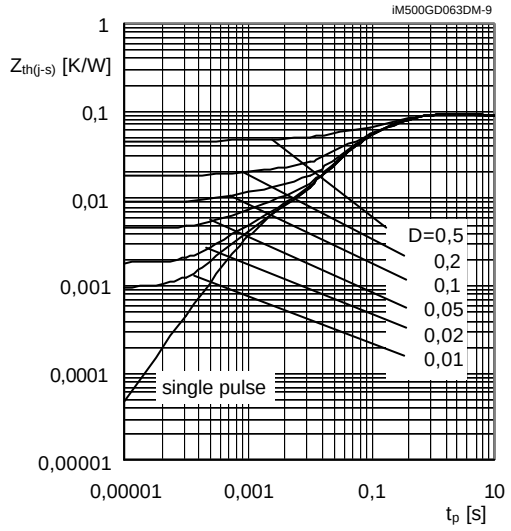


Fig. 9 Transient thermal impedance of IGBT
$Z_{thp(j-s)} = f(t_p)$; $D = t_p / t_c = t_p \cdot f$

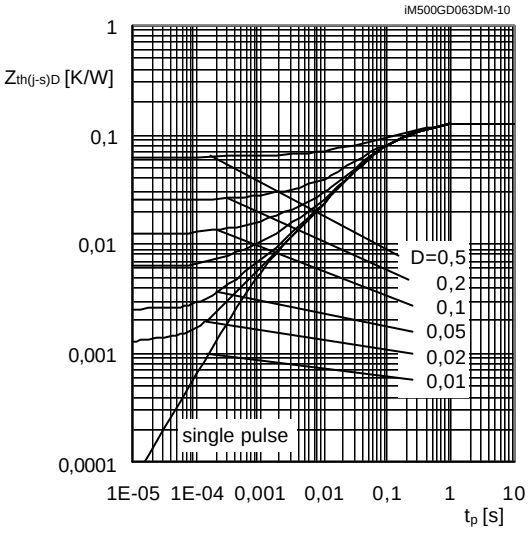


Fig. 10 Transient thermal impedance of FWD
$Z_{thp(j-s)D} = f(t_p)$; $D = t_p / t_c = t_p \cdot f$

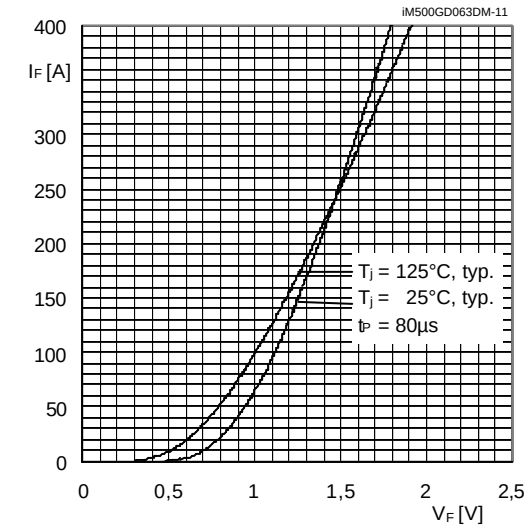
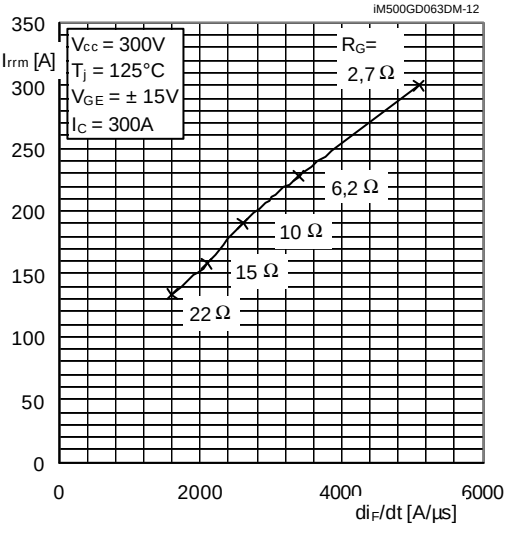
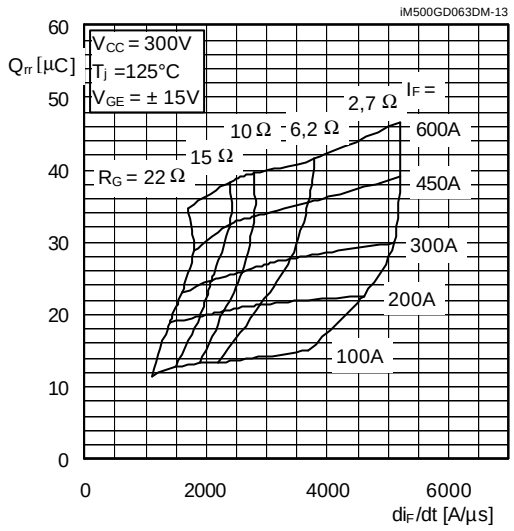


Fig. 11 CAL diode forward



characteristic, inclusive $R_{CC'+EE'}$



This is an electrostatic discharge sensitive device (ESDS).

Please observe the international standard IEC 747-1, Chapter IX.

Fig. 13 Typ. CAL diode recovered charge

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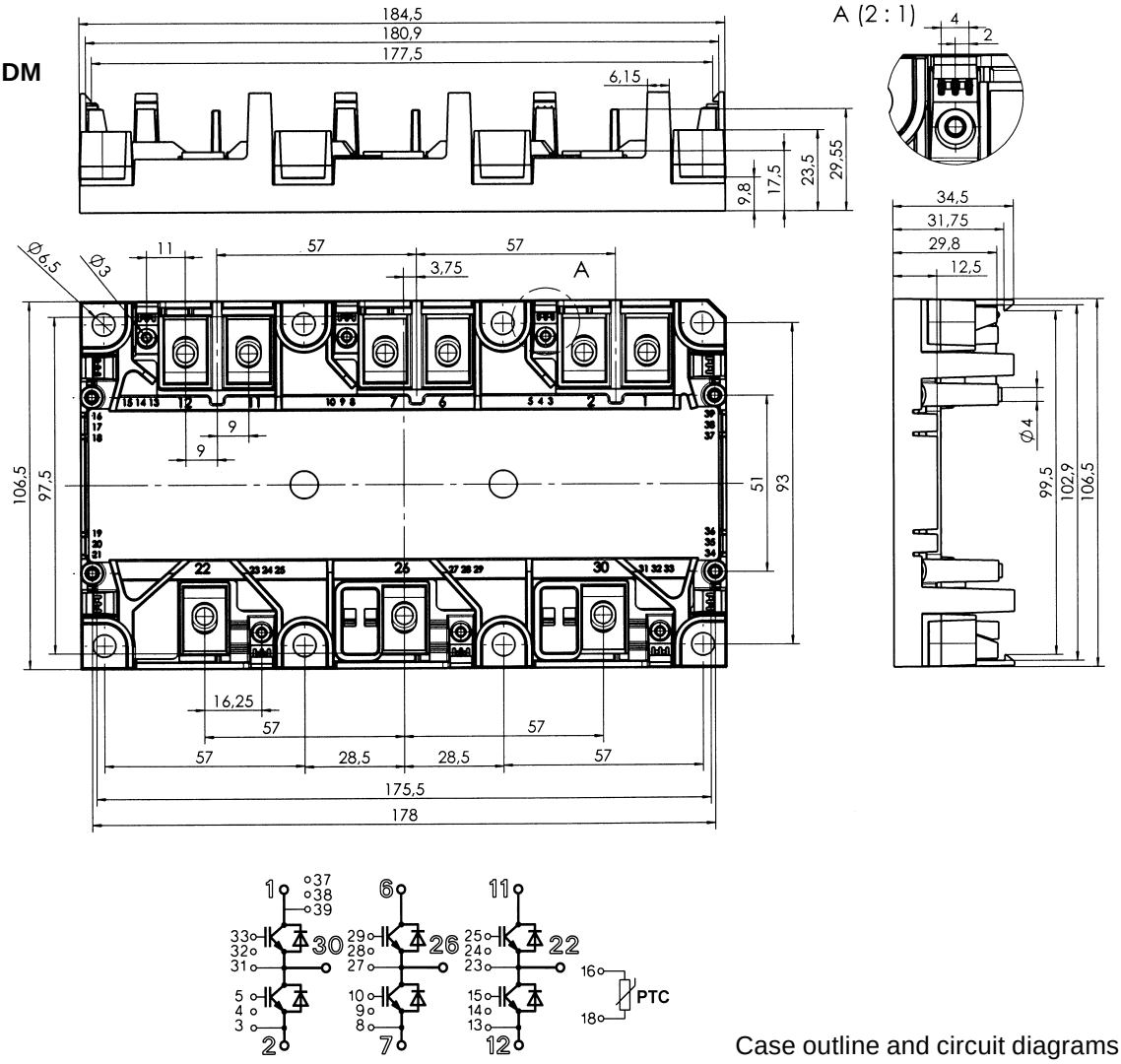

Dimensions in mm

Case outline and circuit diagrams

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

