

MiniSKiiP® 3

3-phase bridge rectifier +
brake chopper + 3-phase
bridge inverter
SKiiP 35NAB12T4V1

Features

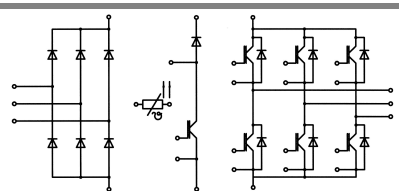
- Trench 4 IGBT's
- Robust and soft freewheeling diodes in CAL technology
- Highly reliable spring contacts for electrical connections
- UL recognised file no. E63532

Typical Applications*

- Inverter up to 26 kVA
- Typical motor power 15 kW

Remarks

- V_{CEsat} , V_F = chip level value
- Case temp. limited to $T_C = 125^\circ\text{C}$ max. (for baseplateless modules $T_C = T_S$)
- product rel. results valid for $T_{j \leq 150}$ (recomm. $T_{op} = -40 \dots +150^\circ\text{C}$)



NAB

Absolute Maximum Ratings		T _s = 25 °C, unless otherwise specified	
Symbol	Conditions	Values	Units
IGBT - Inverter, Chopper			
V _{CES}	T _s = 25 (70) °C	1200	V
I _C		67 (52)	A
I _{CRM}		150	A
V _{GES}		± 20	V
T _j		- 40 ... + 175	°C
Diode - Inverter, Chopper			
I _F	T _s = 25 (70) °C	60 (48)	A
I _{FRM}		150	A
T _j		- 40 ... + 175	°C
Diode - Rectifier			
V _{RRM}	T _s = 70 °C	1600	V
I _F		61	A
I _{FSM}		700	A
i ² t		2400	A ² s
T _j		- 40 ... + 150	°C
Module			
I _{tRMS}	per power terminal (20 A / spring)	80	A
T _{stg}		- 40 ... + 125	°C
V _{isol}	AC, 1 min.	2500	V

Characteristics		T _s = 25 °C, unless otherwise specified			
Symbol	Conditions	min.	typ.	max.	Units
IGBT - Inverter, Chopper					
V _{CEsat}	I _{Cnom} = 50 A, T _j = 25 (150) °C		1,85 (2,25)	2,05 (2,45)	V
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 2 mA	5	5,8	6,5	V
V _{CE(TO)}	T _j = 25 (150) °C		0,8 (0,7)	0,9 (0,8)	V
r _T	T _j = 25 (150) °C		21 (31)	23 (33)	mΩ
C _{ies}	V _{CE} = 25 V, V _{GE} = 0 V, f = 1 MHz		2,77		nF
C _{oes}	V _{CE} = 25 V, V _{GE} = 0 V, f = 1 MHz		0,21		nF
C _{res}	V _{CE} = 25 V, V _{GE} = 0 V, f = 1 MHz		0,16		nF
R _{th(j-s)}	per IGBT		0,71		K/W
t _{d(on)}	under following conditions		60		ns
t _r	V _{CC} = 600 V, V _{GE} = ± 15 V		35		ns
t _{d(off)}	I _{Cnom} = 50 A, T _j = 150 °C		370		ns
t _f	R _{Gon} = R _{Goff} = 15 Ω		60		ns
E _{on}	inductive load		6		mJ
E _{off}			4,7		mJ
Diode - Inverter, Chopper					
V _F = V _{EC}	I _{Fnom} = 50 A, T _j = 25 (150) °C		2,25 (2,2)	2,55 (2,5)	V
V _(TO)	T _j = 25 (150) °C		1,3 (0,9)	1,5 (1,1)	V
r _T	T _j = 25 (150) °C		19 (26)	21 (28)	mΩ
R _{th(j-s)}	per diode		0,95		K/W
I _{RRM}	under following conditions		45		A
Q _{rr}	I _{Fnom} = 50 A, V _R = 600 V		8,6		μC
E _{rr}	V _{GE} = 0 V, T _j = 150 °C		3,4		mJ
	di _F /dt = 1400 A/μs				
Diode - Rectifier					
V _F	I _{Fnom} = 35 A, T _j = 25 °C		1,1		V
V _(TO)	T _j = 150 °C		0,8		V
r _T	T _j = 150 °C		11		mΩ
R _{th(j-s)}	per diode		0,9		K/W
Temperature Sensor					
R _{ts}	3 %, T _r = 25 (100) °C		1000(1670)		Ω
Mechanical Data					
w			95		g
M _s	Mounting torque	2		2,5	Nm

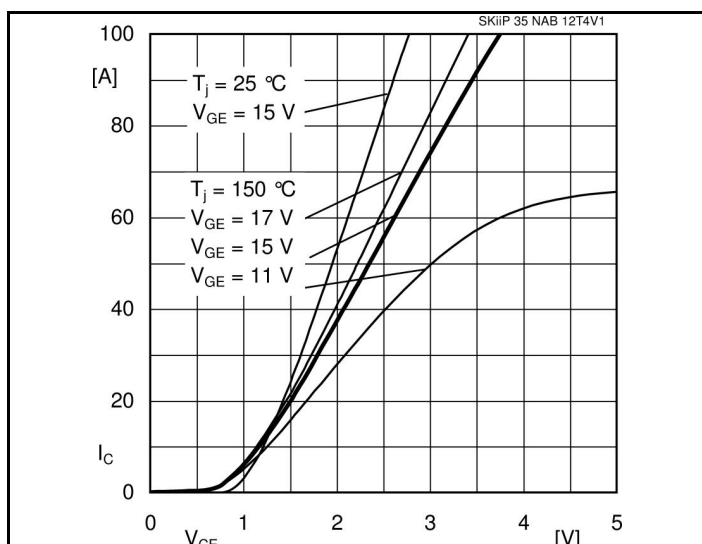


Fig. 1 Typ. output characteristic

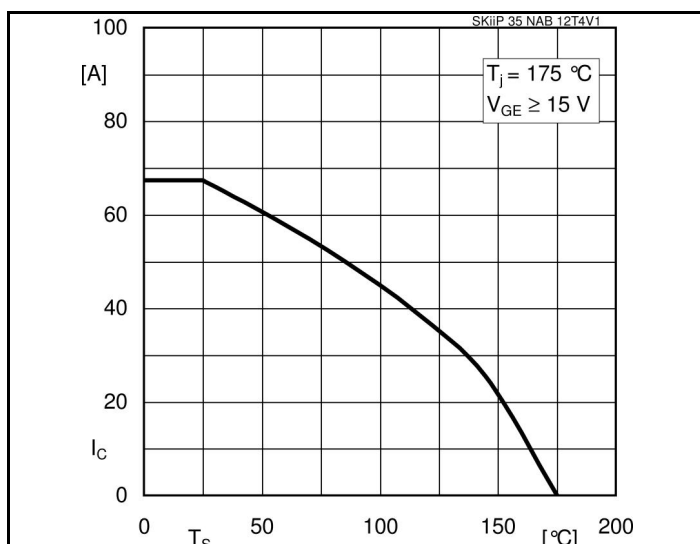


Fig. 2 Typ. rated current vs. temperature $I_C = f(T_s)$

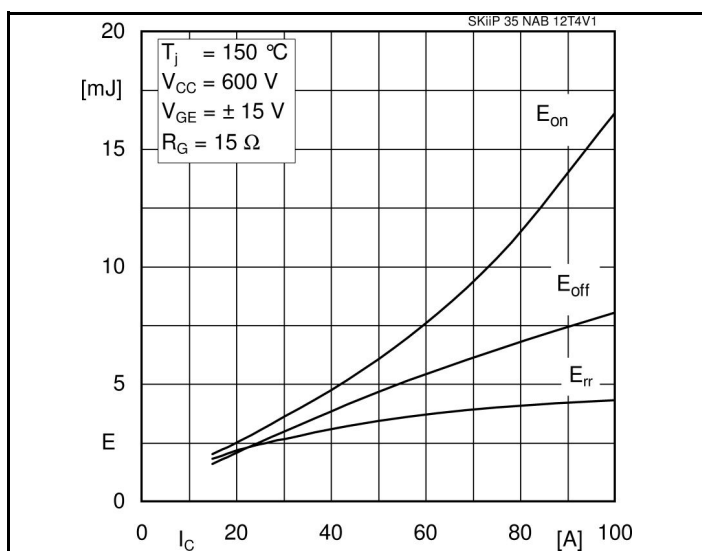


Fig. 3 Typ. turn-on /off energy = $f(I_C)$

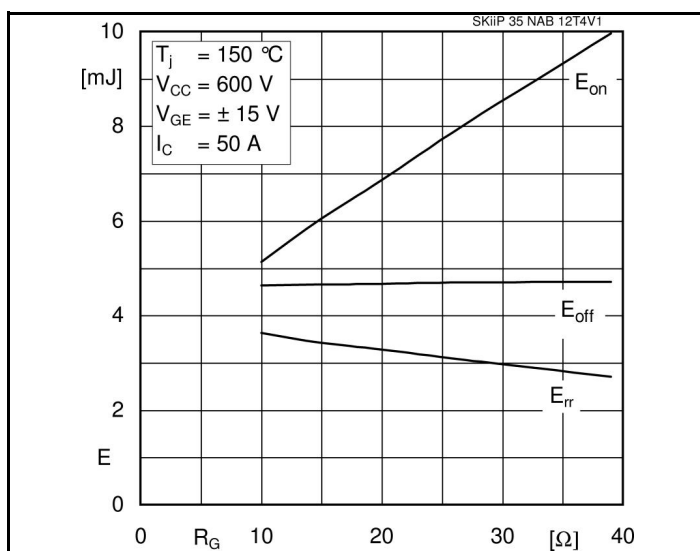


Fig. 4 Typ. turn-on /off energy = $f(R_G)$

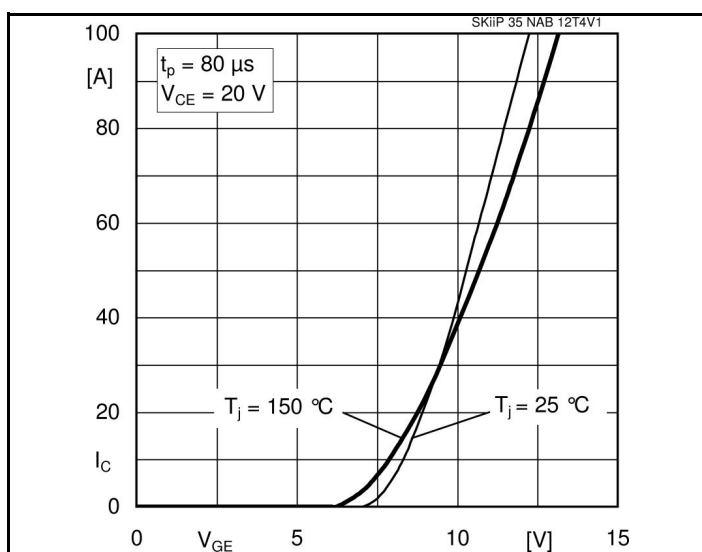


Fig. 5 Typ. transfer characteristic

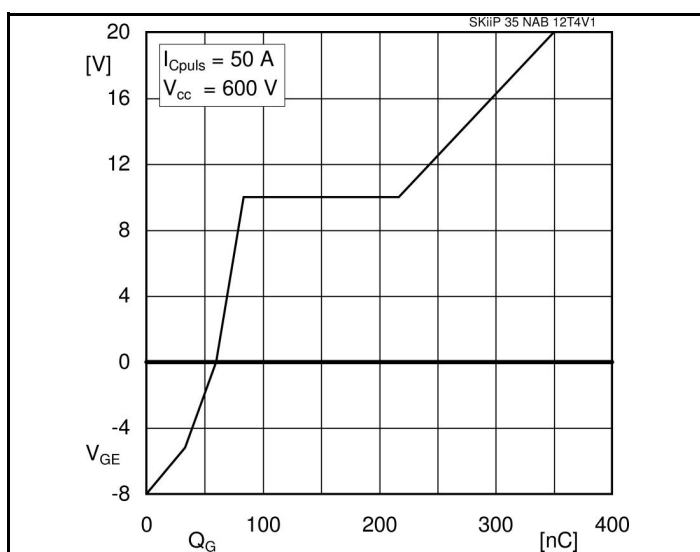
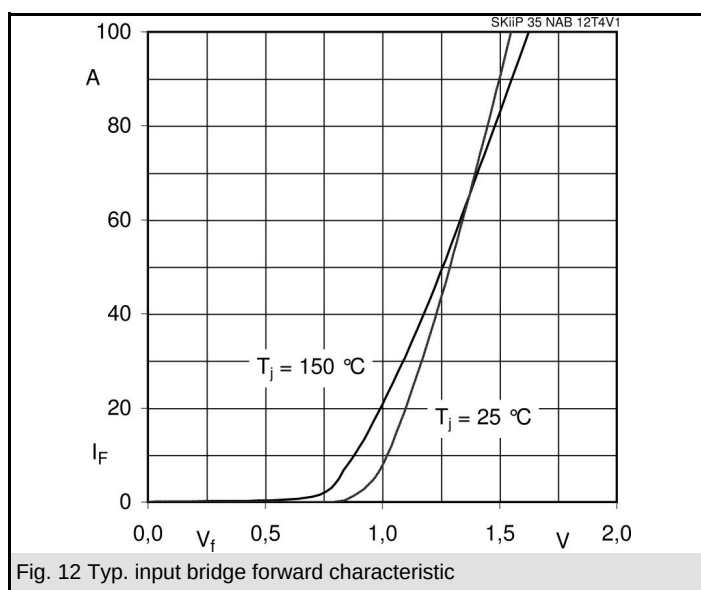
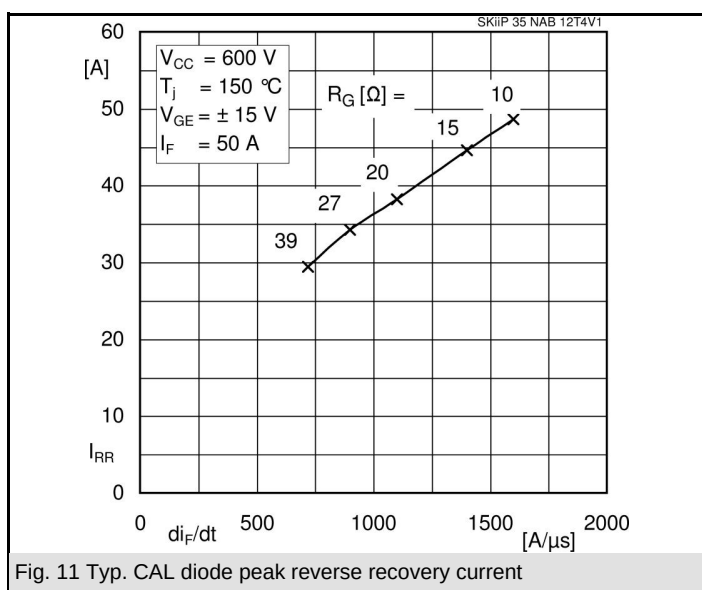
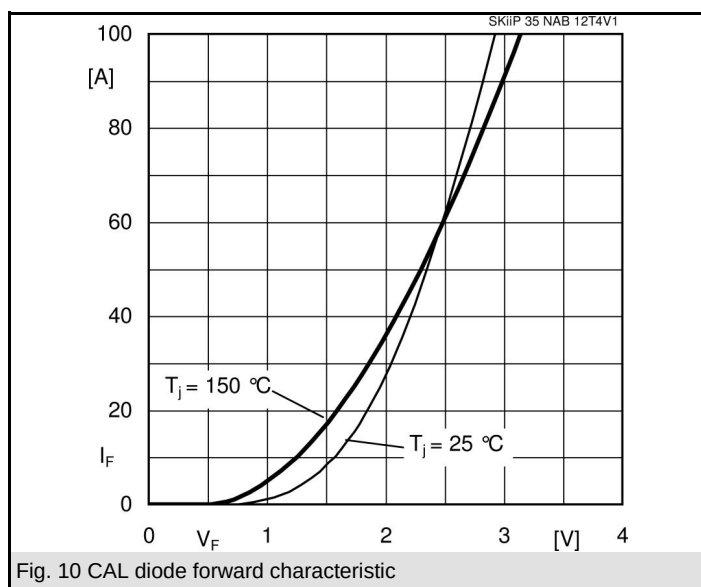
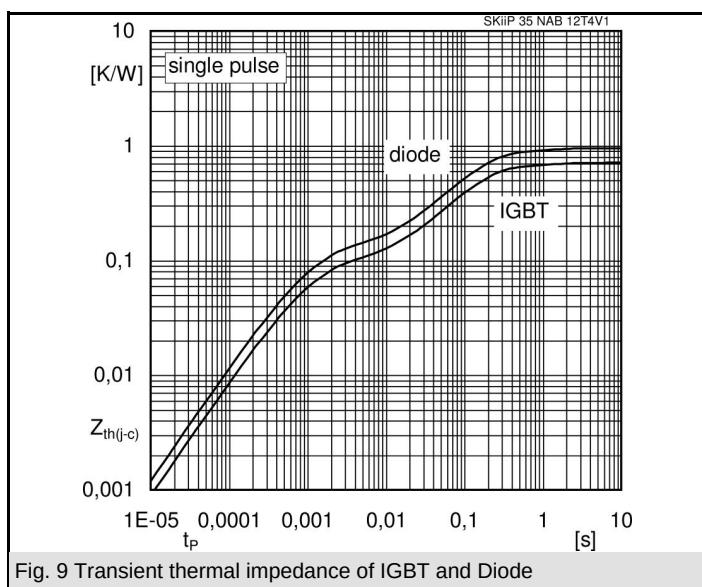
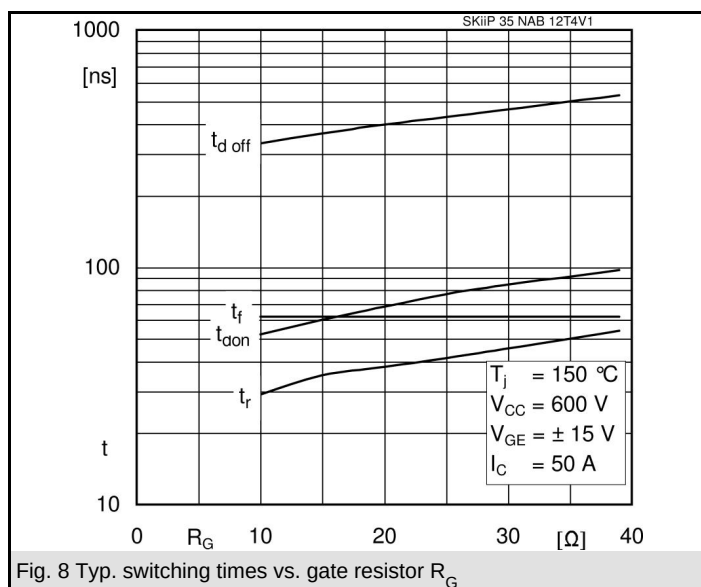
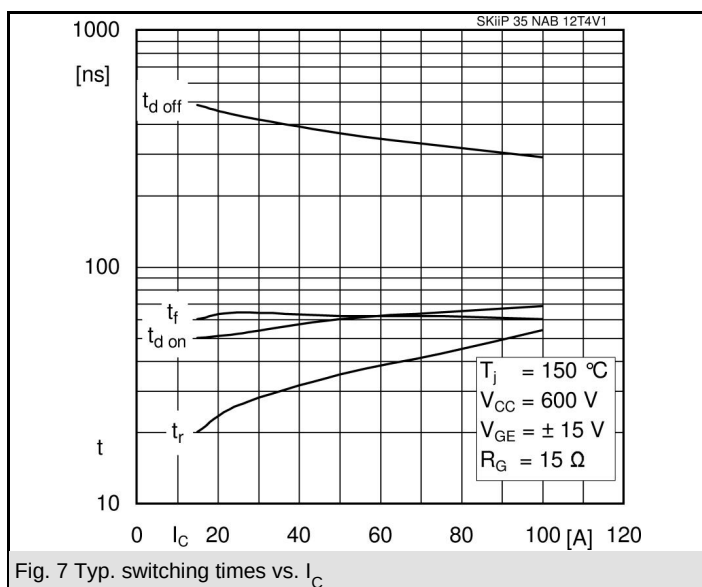
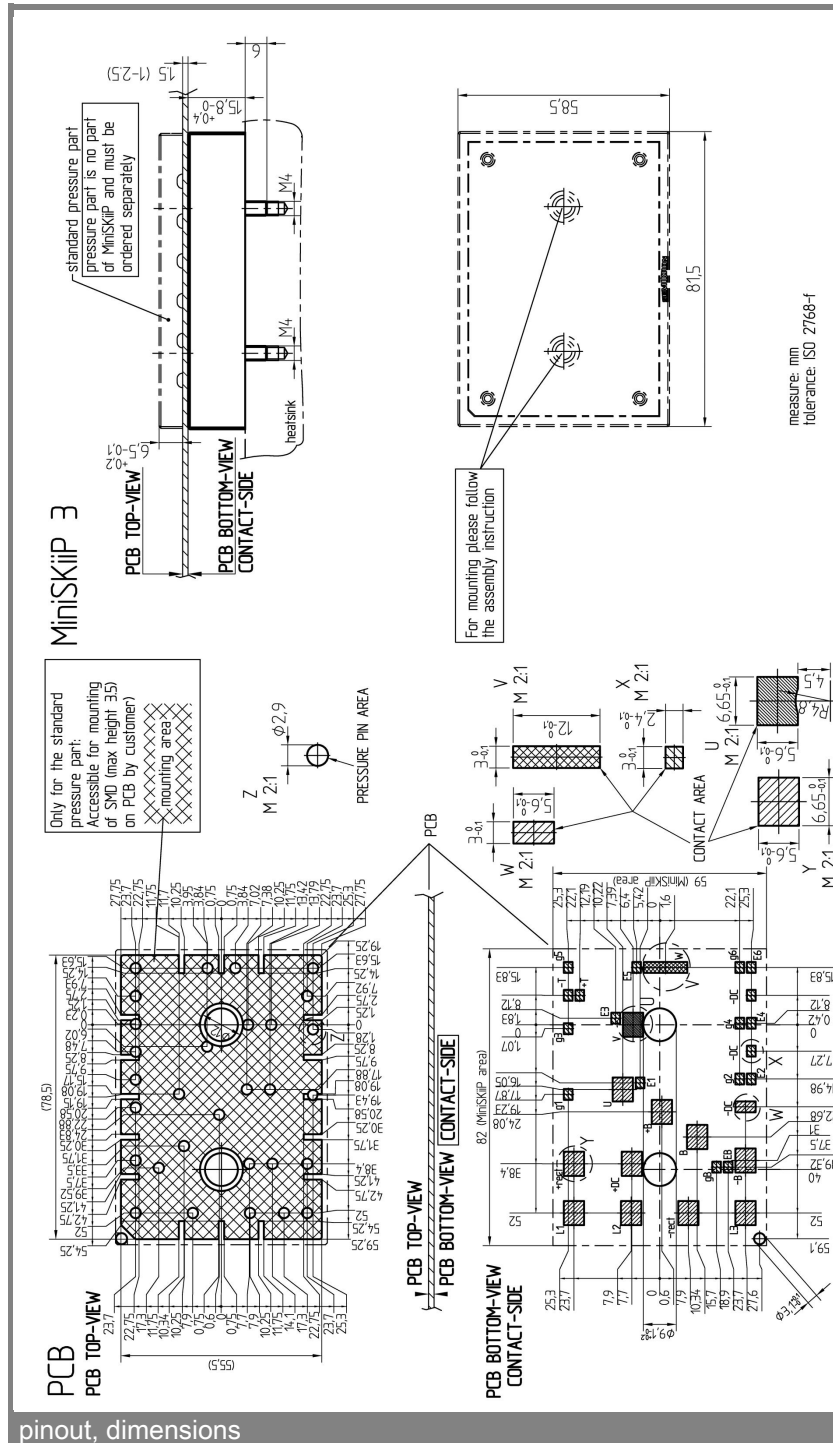
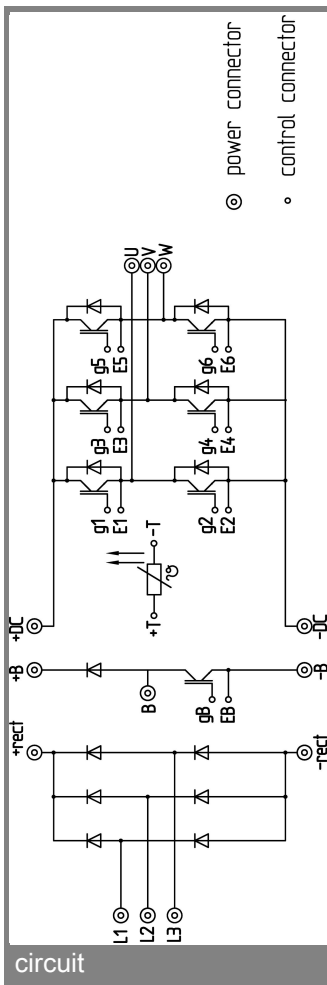


Fig. 6 Typ. gate charge characteristic





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

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