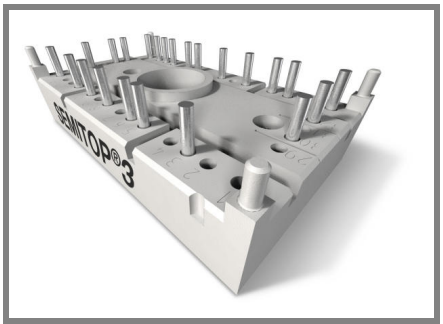


SEMITOP®3

3-phase bridge rectifier + brake chopper + 3-phase bridge inverter

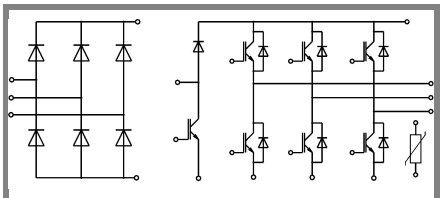
SK 15 DGDL 12T4 ET

Target Data

Features

- One screw mounting module
- Trench4 IGBT technology
- CAL4 technology FWD
- Integrated NTC temperature sensor

1) $V_{CE,sat}$, V_F = chip level value



DGDL - ET

Absolute Maximum Ratings		Ts = 25 °C, unless otherwise specified	
Symbol	**Conditions**	**Values**	**Units**
IGBT - Inverter,Chopper			
V_{CES}		1200	V
I_C	T_s = 25 (70) °C	27 (21)	A
I_{CRM}	I_{CRM}= 3 x I_{Cnom}, t_p = 1 ms	45	A
V_{GES}		± 20	V
T_j		-40 ... +175	°C
Diode - Inverter,Chopper			
I_F	T_s = 25 (70) °C	21 (17)	A
I_{FRM}	I_{FRM} = 2xI_{Fnom}, t_p = 1 ms	45	A
T_j		-40 ... +150	°C
Rectifier			
V_{RRM}		1600	V
I_F	T_s = 70 °C	28	A
I_{FSM} / I_{TSM}	t_p = 10 ms , sin 180 ° ,T_j = 25 °C	220	A
I^2t	t_p = 10 ms , sin 180 ° ,T_j = 25 °C	240	A²s
T_j		-40 ... +175	°C
T_{sol}	Terminals, 10 s	260	°C
T_{stg}		-40 ... +125	°C
V_{isol}	AC, 1 min. / 1 s	2500 / 3000	V

Characteristics		Ts = 25 °C, unless otherwise specified			
Symbol	**Conditions**	**min.**	**typ.**	**max.**	**Units**
IGBT - Inverter					
V_{CEsat}	I_C = 15 A, T_j = 25 (150) °C		1,85 (2,25)	2,05 (2,45)	V
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 0,5 mA	5	5,8	6,5	V
$V_{CE(TO)}$	T_j = 25 °C (150) °C		1,1 (1)	1,3 (1,2)	V
r_T	T_j = 25 °C (150) °C		50 (83,3)		mΩ
C_{ies}	V_{CE} = 25 V_{GE} = 0 V, f = 1 MHz		0,9		nF
C_{oes}	V_{CE} = 25 V_{GE} = 0 V, f = 1 MHz		0,08		nF
C_{res}	V_{CE} = 25 V_{GE} = 0 V, f = 1 MHz		0,055		nF
$R_{th(j-s)}$	per IGBT		1,65		K/W
$t_{d(on)}$	under following conditions		16		ns
t_r	V_{CC} = 600 V, V_{GE} = ± 15 V		14		ns
$t_{d(off)}$	I_C = 15 A, T_j = 150 °C		273		ns
t_f	R_{Gon} = R_{Goff} = 16 Ω		85		ns
E_{on}	inductive load		0,82		mJ
E_{off}			1,52		mJ
Diode - Inverter,Chopper					
V_F = V_{EC}	I_F = 15 A, T_j = 25(150) °C		2,38 (2,44)	2,71 (2,77)	V
$V_{(TO)}$	T_j = 25 °C (150) °C		1,3 (0,9)	1,5 (1,1)	V
r_T	T_j = 25 °C (150) °C		72 (102,7)	80,6 (111,3)	mΩ
$R_{th(j-s)}$	per diode		2,34		K/W
I_{RRM}	under following conditions		28		A
Q_{rr}	I_F = 15 A, V_R = V		0,3		µC
E_{rr}	V_{GE} = 0 V, T_j = 150 °C		0,82		mJ
	$di_{F/dt}$ = 2750 A/µs				
Diode - Rectifier					
V_F	I_F = 15 A, T_j = 25() °C		1,1		V
$V_{(TO)}$	T_j = 150 °C		0,9		V
r_T	T_j = 150 °C		20		mΩ
$R_{th(j-s)}$	per diode		2		K/W
Temperatur sensor					
R_{ts}	5 %, T_r = 25 (100) °C		5000(493)		Ω
Mechanical data					
w			30		g
M_s	Mounting torque	2,25		2,5	Nm

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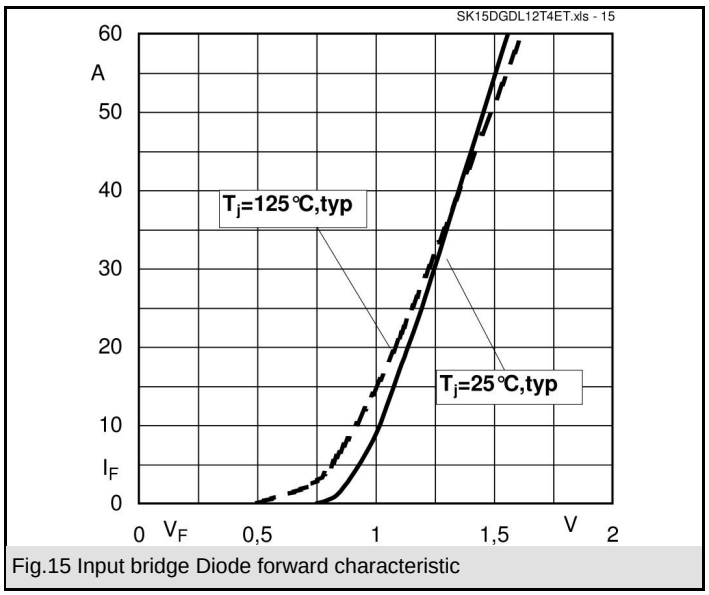

Fig.15 Input bridge Diode forward characteristic

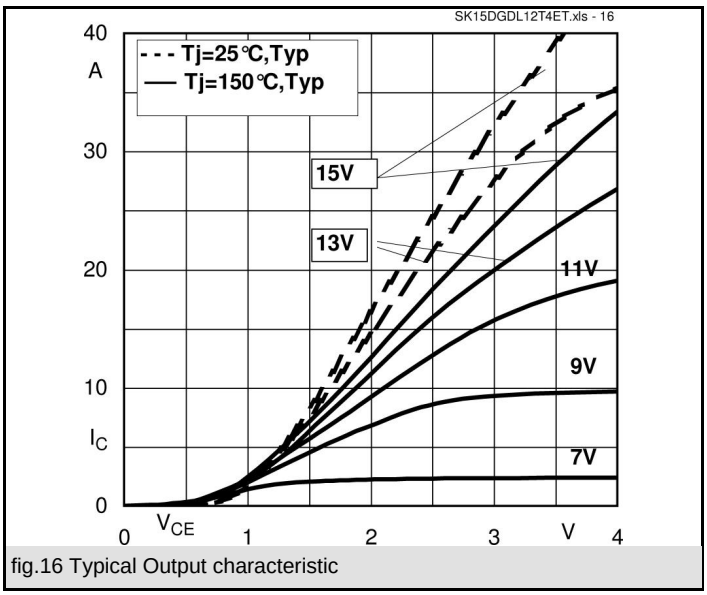

fig.16 Typical Output characteristic

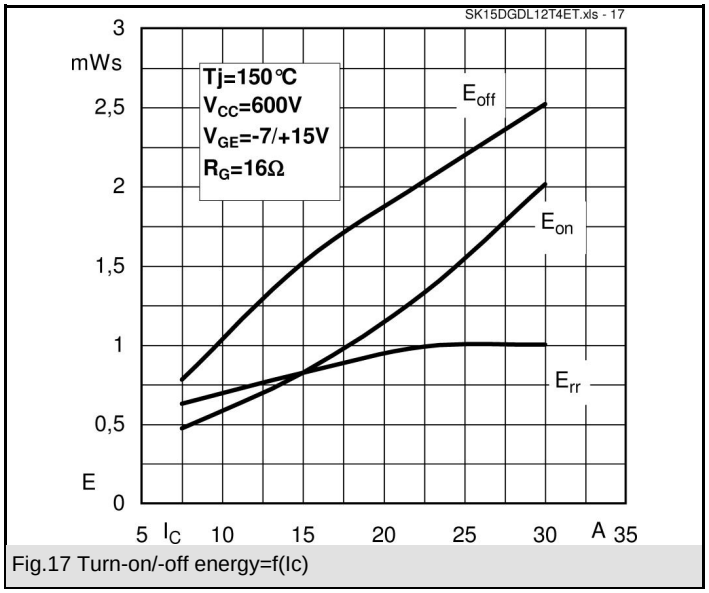

Fig.17 Turn-on/-off energy=f(Ic)

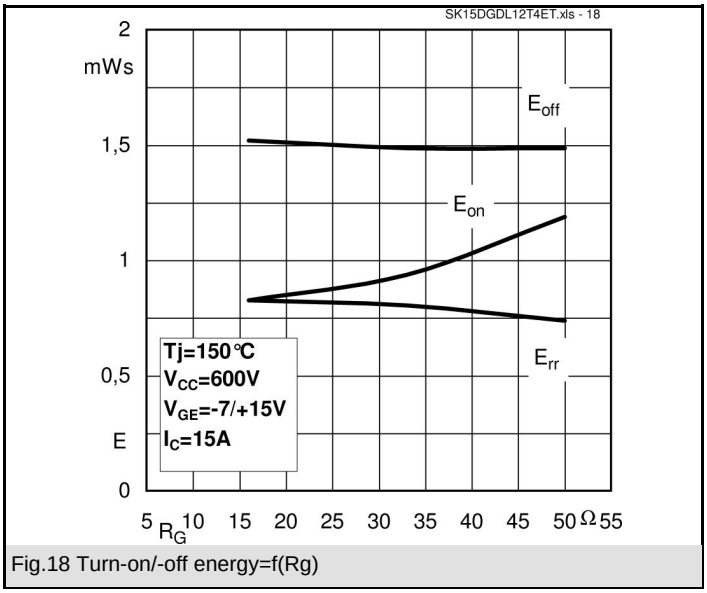

Fig.18 Turn-on/-off energy=f(Rg)

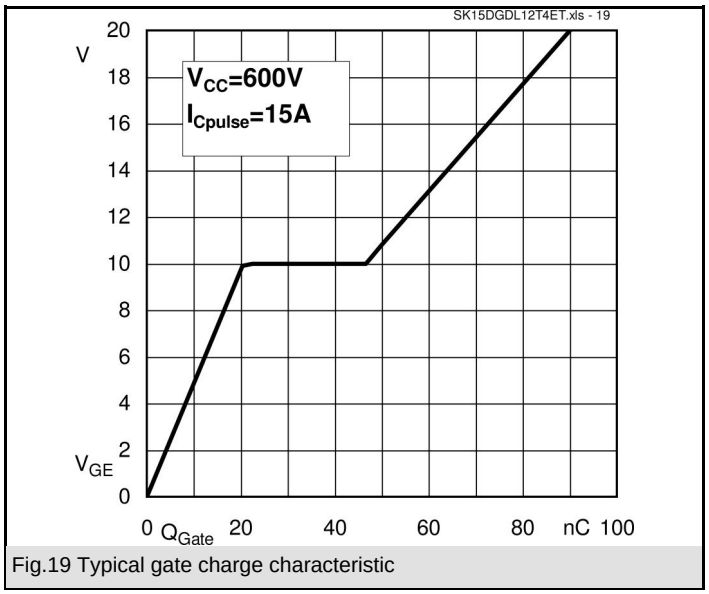

Fig.19 Typical gate charge characteristic

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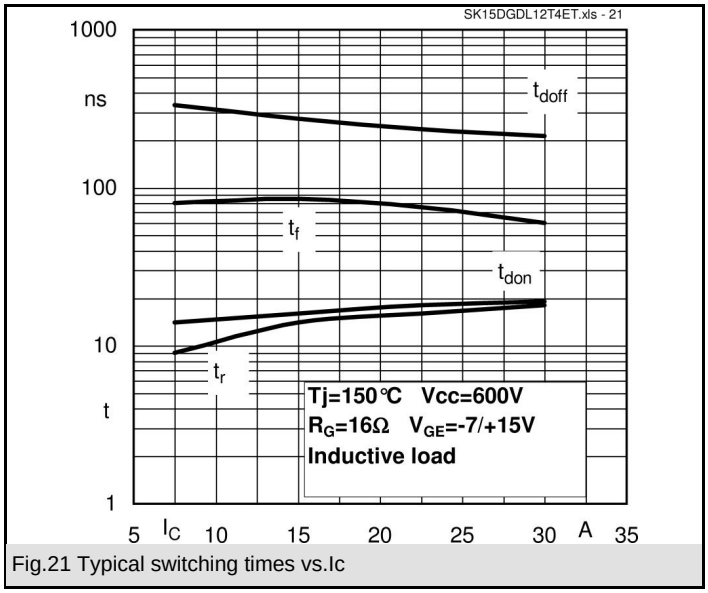


Fig.21 Typical switching times vs.Ic

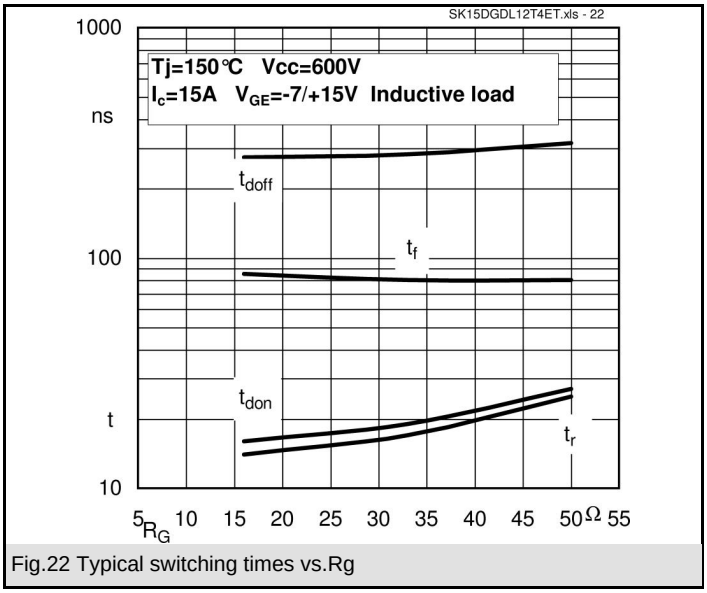


Fig.22 Typical switching times vs.Rg

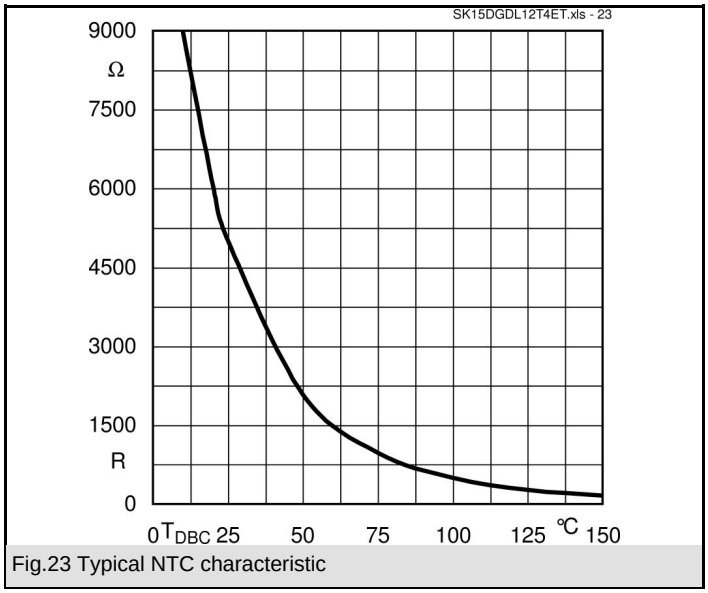
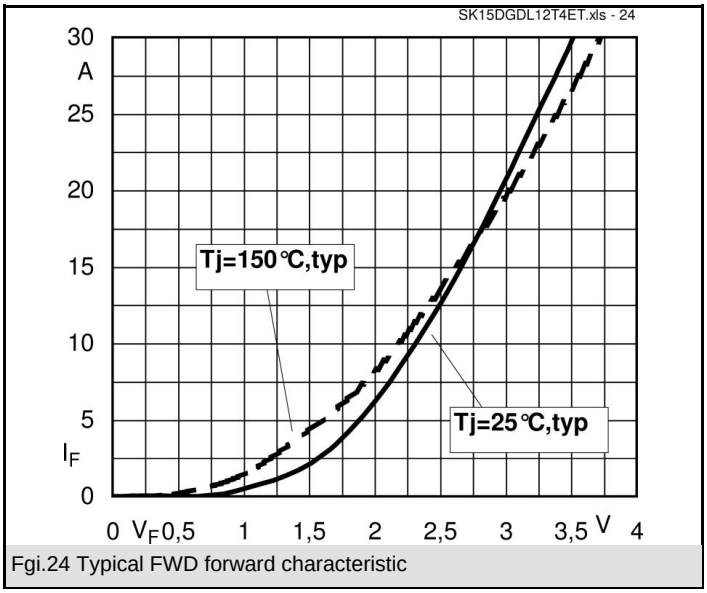


Fig.23 Typical NTC characteristic



Fgi.24 Typical FWD forward characteristic

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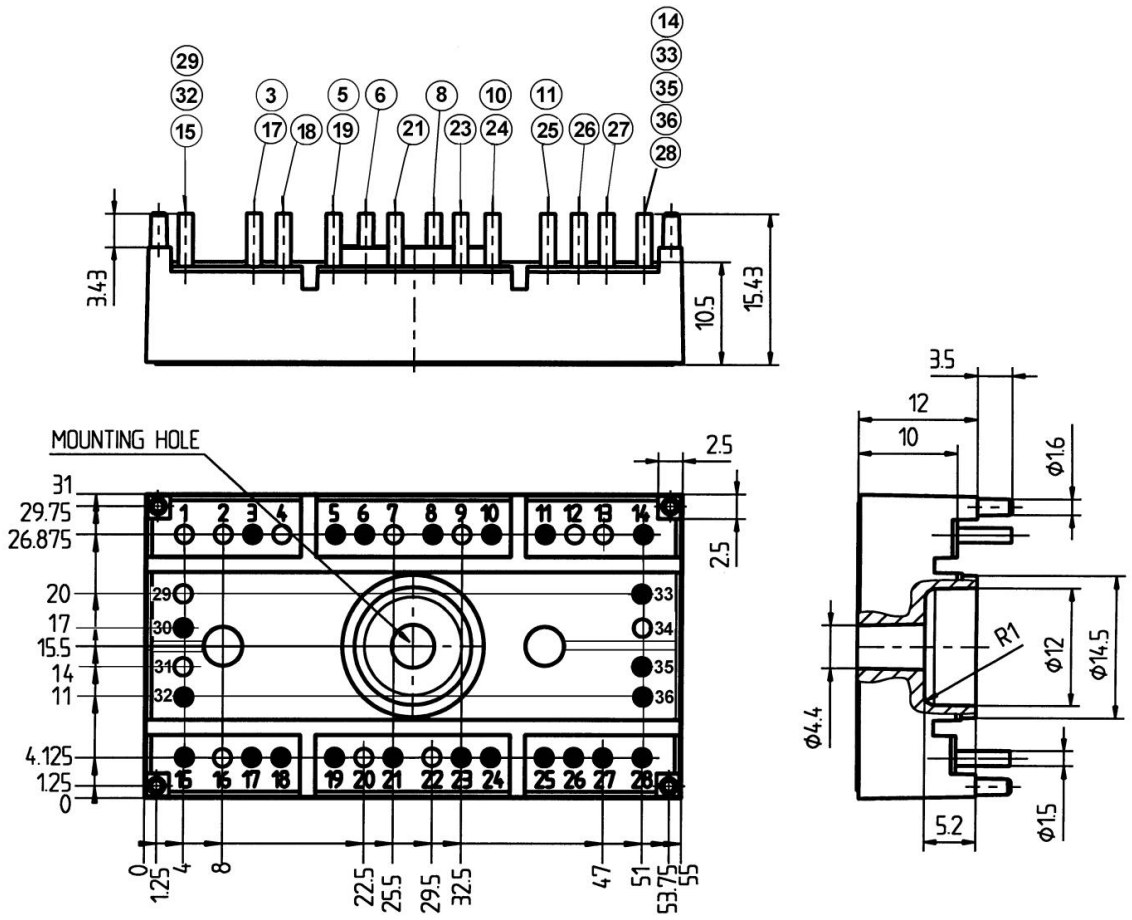
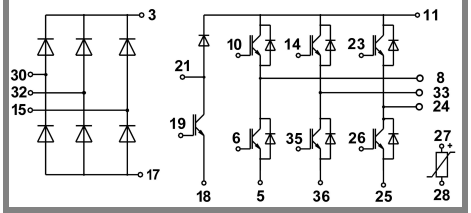
Dimensions in mm



Case T 49 (Suggested hole diameter for solder pins and for mounting plastic pins: 2mm)



Case T 49

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.

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