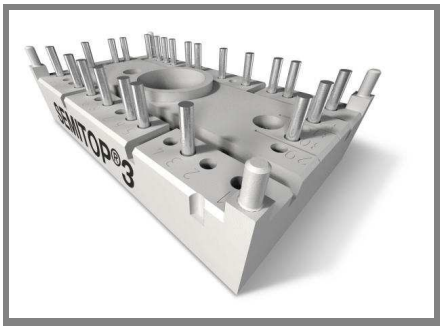


SEMITOP®3

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

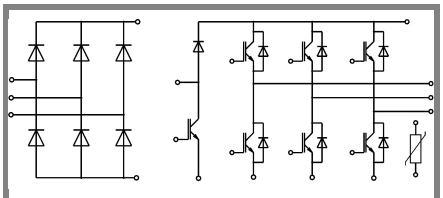
SK 15 DGDL 12T4 ET

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

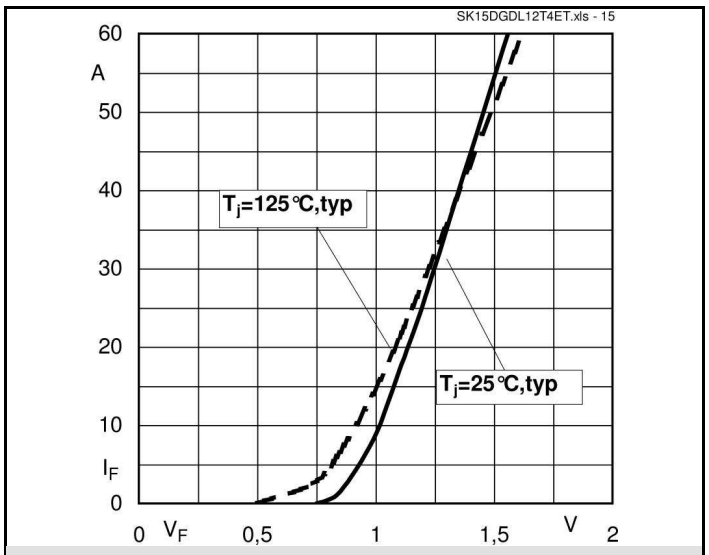


Fig.15 Input bridge Diode forward characteristic

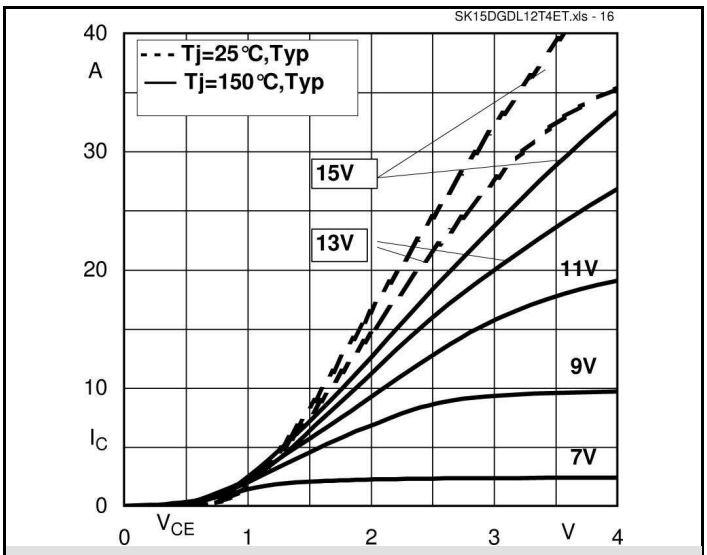


fig.16 Typical Output characteristic

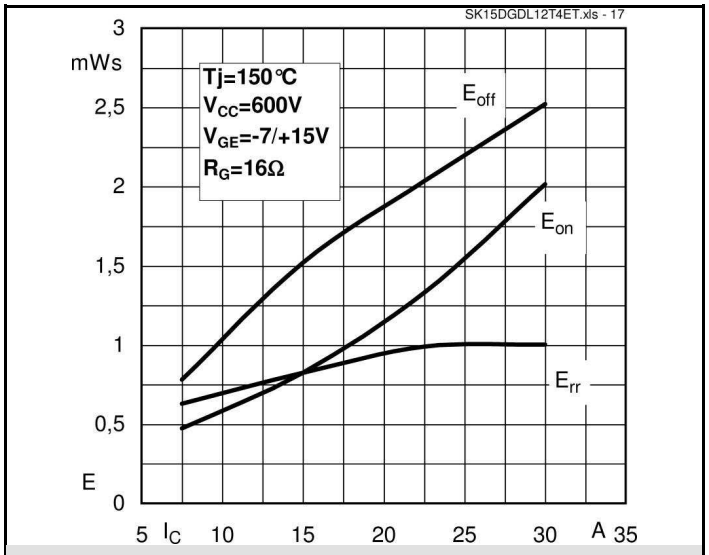


Fig.17 Turn-on/-off energy=f(Ic)

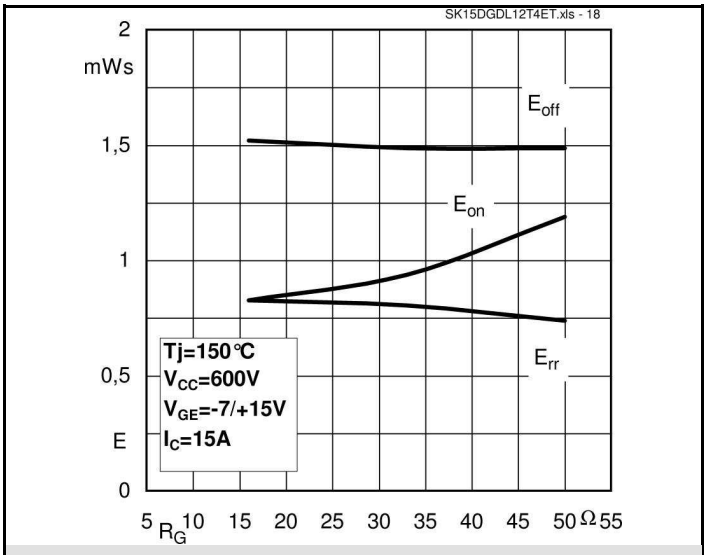


Fig.18 Turn-on/-off energy=f(Rg)

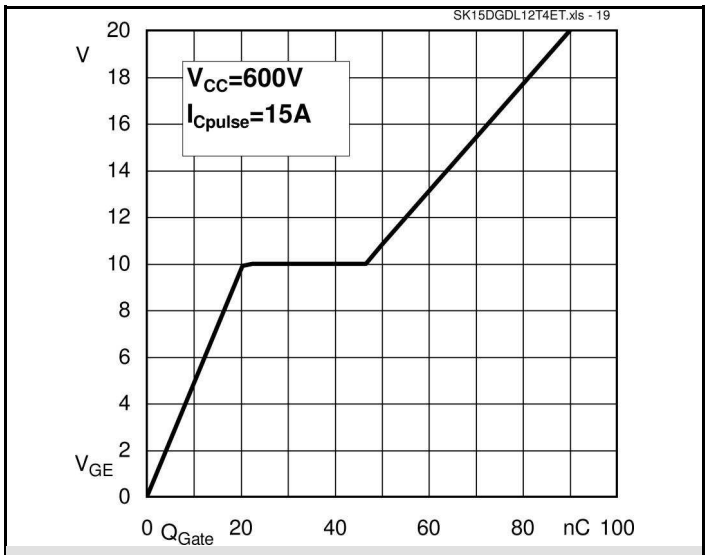


Fig.19 Typical gate charge characteristic

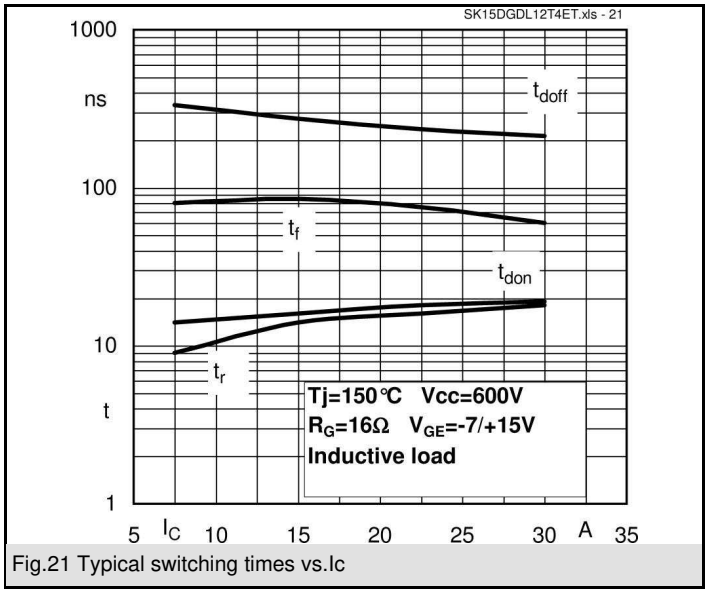


Fig.21 Typical switching times vs.Ic

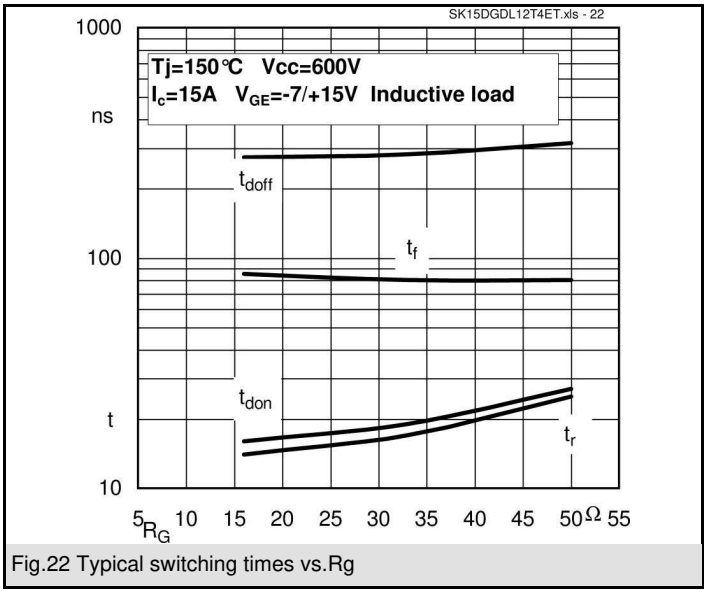


Fig.22 Typical switching times vs.Rg

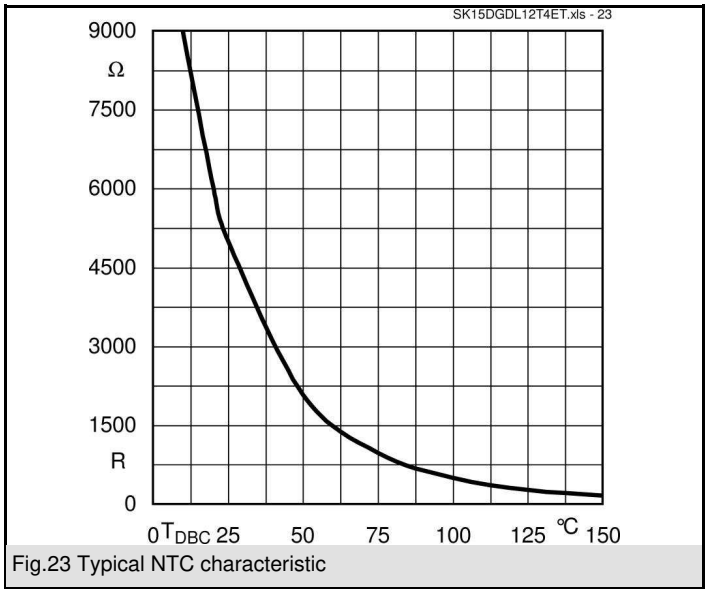
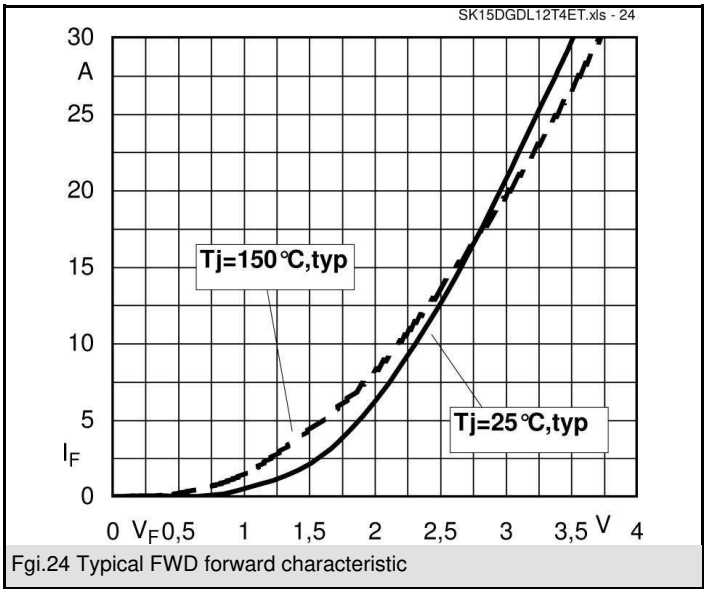
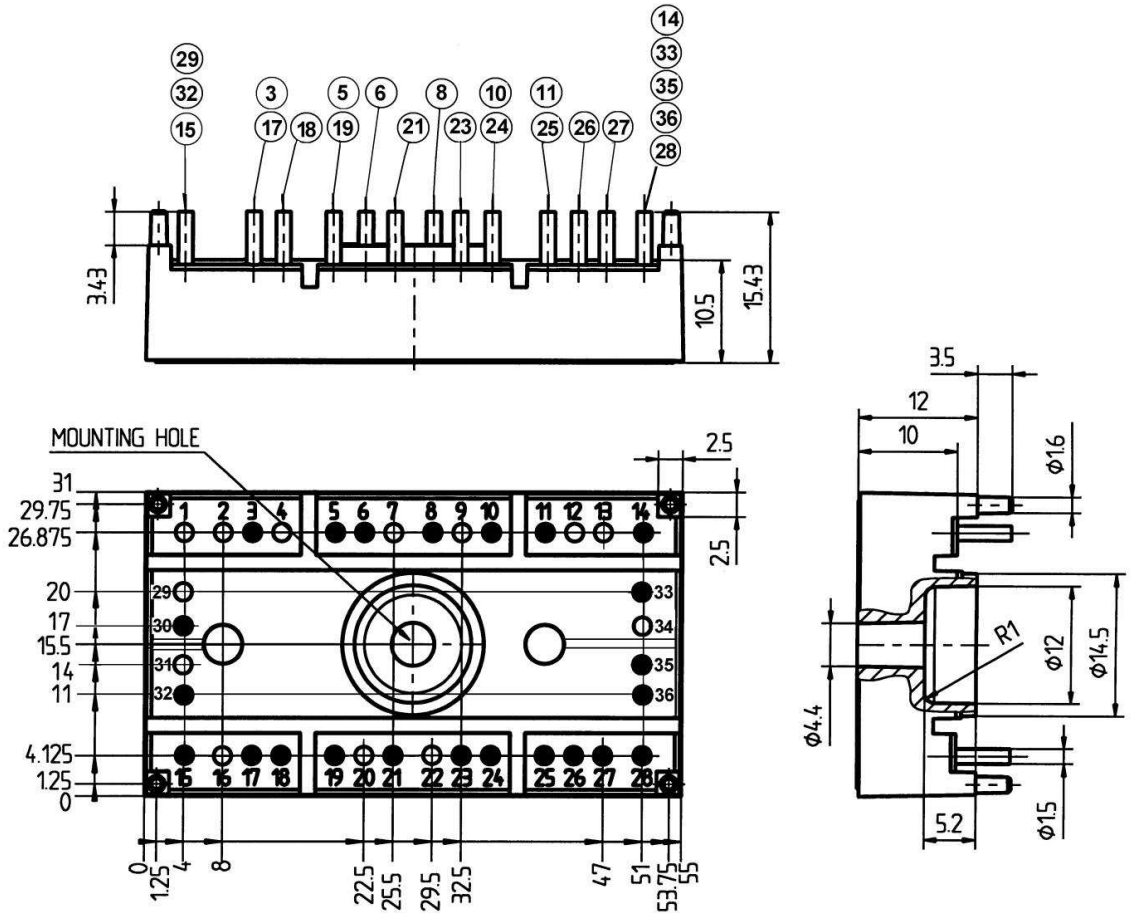


Fig.23 Typical NTC characteristic

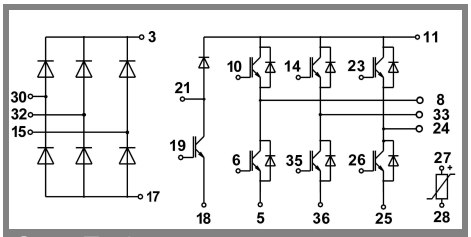


Fgi.24 Typical FWD forward characteristic

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.

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