

SEMITOP[®] 3

3-phase bridge rectifier + brake chopper +3-phase bridge inverter SK 15 DGDL 126 ET

Preliminary Data

Features

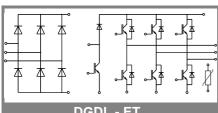
- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded alumium oxide ceramic (DCB)
- Trench technology IGBT
- CAL High Density FWD
- Integrated NTC temperature sensor

Typical Applications

Inverter

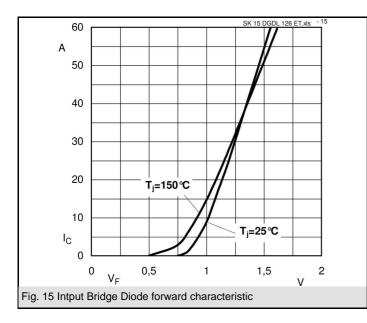
Absolute	Maximum Ratings	T _s = 25°C, unless otherwise	T_s = 25°C, unless otherwise specified				
Symbol	Conditions	Values	Units				
IGBT - Inverter, Chopper							
V _{CES}		1200	V				
I _C	T _s = 25 (80) °C	22 (15)	А				
I _{CRM}	$I_{CRM} = 2 \times I_{Cnom}, t_p = 1 \text{ ms}$	30	А				
V _{GES}		±20	V				
Т _ј		-40 +150	°C				
Diode - Inverter, Chopper							
I _F	T _s = 25 (80) °C	25 (17)	А				
I _{FRM}	$I_{FRM} = 2xI_{Fnom}, t_p = 1 \text{ ms}$	30	А				
Т _ј		-40 +150	°C				
Rectifier							
V _{RRM}		1600	V				
I _F	T _s = 80 °C	21	А				
I _{FSM} / I _{TSM}	t _p = 10 ms , sin 180 ° ,T _j = 25 °C	220	А				
l ² t	t _p = 10 ms , sin 180 ° ,T _j = 25 °C	240	A²s				
Т _ј		-40 +150	°C				
T _{sol}	Terminals, 10s	260	°C				
T _{stg}		-40 +125	°C				
V _{isol}	AC, 1 min. / 1s	2500 / 3000	V				

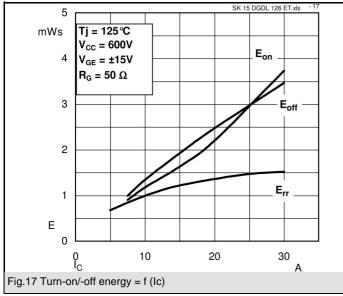
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	Characte	ristics	T _s = 25°C,	T_s = 25°C, unless otherwise specified					
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Symbol	Conditions	min.	typ.	max.	Units			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	IGBT - Inverter, Chopper								
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	V _{CEsat}			1,7 (2)	2,1	V			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	V _{GE(th)}		5	5,8	6,5	V			
$\begin{array}{c} \dot{C}_{ies} & \dot{V}_{CE} = 25 V_{GE} = 0 V, f = 1 MHz & 1,2 \\ C_{oes} & V_{CE} = 25 V_{GE} = 0 V, f = 1 MHz & 0,1 \\ V_{CE} = 25 V_{GE} = 0 V, f = 1 MHz & 9,1 \\ R_{th(j\cdots)} & per IGBT & 1.6 \ P \\ t_{d(on)} & under following conditions & 25 \\ t_{} & V_{CC} = 600 V, V_{GE} = \pm 15 V & 25 \\ t_{d(off)} & l_{C} = 15 A, T_{j} = 125 ^{\circ}C & 385 \\ t_{f} & R_{Gon} = R_{Goff} = 30 \Omega & 90 \\ E_{onf} & 1.8 \\ \hline \end{tabular}$. ,		V			
$\begin{array}{cccc} C_{oes} & V_{CE} = 25 \ V_{GE} = 0 \ V, \ f = 1 \ MHz & 0, 1 \\ C_{res} & V_{CE} = 25 \ V_{GE} = 0 \ V, \ f = 1 \ MHz & 9, 1 \\ \hline R_{th(j:s)} & per \ IGBT & 1, 6 \ P \\ \hline R_{th(j:s)} & per \ IGBT & 1, 6 \ P \\ \hline T_{t} & V_{CC} = 600 \ V, \ V_{CE} = \pm 15 \ V & 25 \\ \hline T_{t} & V_{CC} = 600 \ V, \ V_{CE} = \pm 15 \ V & 25 \\ \hline T_{t} & R_{Gon} = R_{Goff} = 30 \ \Omega & 90 \\ \hline E_{on} & inductive \ Ioad & 2 \\ \hline E_{off} & 1, 8 \\ \hline \textbf{Diode - Inverter, Chopper} \\ \hline V_{F} = V_{EC} & I_{F} = 15 \ A, \ T_{j} = 25(125) \ ^{\circ}C & 1, 6 \ (1, 6) \\ V_{(TO)} & T_{j} = 25 \ ^{\circ}C \ (125) \ ^{\circ}C & 10 \\ \hline N_{F} & V_{CE} = 15 \ A, \ T_{j} = 25(125) \ ^{\circ}C & 10 \\ \hline N_{rT} & T_{j} = 25 \ ^{\circ}C \ (125) \ ^{\circ}C & 10 \\ \hline N_{Rth(j:s)} & per \ diode & 2, 1 \\ \hline N_{RRM} & under \ following \ conditions & 25 \\ \hline Q_{rr} & I_{F} = 15 \ A, \ T_{j} = 25(125) \ ^{\circ}C & 1, 1 \\ \hline N_{RRM} & under \ following \ conditions & 25 \\ \hline Q_{rr} & I_{F} = 15 \ A, \ T_{j} = 125 \ ^{\circ}C & 1, 1 \\ \hline N_{CO} & T_{j} = 125 \ ^{\circ}C & 1, 1 \\ \hline N_{rT} & T_{j} = 150 \ ^{\circ}C & 0, 9 \\ \hline Diode \ rectifier \\ \hline V_{F} & I_{F} = 15 \ A, \ T_{j} = 25() \ ^{\circ}C & 1, 1 \\ \hline V_{(TO)} & T_{j} = 150 \ ^{\circ}C & 20 \\ \hline T_{r} & T_{j} = 150 \ ^{\circ}C & 20 \\ \hline R_{th(j:s)} & per \ diode & 2 \\ \hline F_{th(j:s)} & per \ diode & 2 \\ \hline Temperatur \ sensor \\ \hline R_{ts} & 5 \ ^{\circ}, \ T_{r} = 25 \ (100) \ ^{\circ}C \\ \hline Mechanical \ data \\ \hline \end{tabular}$	r _T					mΩ			
$\begin{array}{cccc} C_{oes} & V_{CE} = 25 \ V_{GE} = 0 \ V, \ f = 1 \ MHz & 0, 1 \\ C_{res} & V_{CE} = 25 \ V_{GE} = 0 \ V, \ f = 1 \ MHz & 9, 1 \\ \hline R_{th(j:s)} & per \ IGBT & 1, 6 \ P \\ \hline R_{th(j:s)} & per \ IGBT & 1, 6 \ P \\ \hline T_{t} & V_{CC} = 600 \ V, \ V_{CE} = \pm 15 \ V & 25 \\ \hline T_{t} & V_{CC} = 600 \ V, \ V_{CE} = \pm 15 \ V & 25 \\ \hline T_{t} & R_{Gon} = R_{Goff} = 30 \ \Omega & 90 \\ \hline E_{on} & inductive \ Ioad & 2 \\ \hline E_{off} & 1, 8 \\ \hline \textbf{Diode - Inverter, Chopper} \\ \hline V_{F} = V_{EC} & I_{F} = 15 \ A, \ T_{j} = 25(125) \ ^{\circ}C & 1, 6 \ (1, 6) \\ V_{(TO)} & T_{j} = 25 \ ^{\circ}C \ (125) \ ^{\circ}C & 10 \\ \hline N_{F} & V_{CE} = 15 \ A, \ T_{j} = 25(125) \ ^{\circ}C & 10 \\ \hline N_{rT} & T_{j} = 25 \ ^{\circ}C \ (125) \ ^{\circ}C & 10 \\ \hline N_{Rth(j:s)} & per \ diode & 2, 1 \\ \hline N_{RRM} & under \ following \ conditions & 25 \\ \hline Q_{rr} & I_{F} = 15 \ A, \ T_{j} = 25(125) \ ^{\circ}C & 1, 1 \\ \hline N_{RRM} & under \ following \ conditions & 25 \\ \hline Q_{rr} & I_{F} = 15 \ A, \ T_{j} = 125 \ ^{\circ}C & 1, 1 \\ \hline N_{CO} & T_{j} = 125 \ ^{\circ}C & 1, 1 \\ \hline N_{rT} & T_{j} = 150 \ ^{\circ}C & 0, 9 \\ \hline Diode \ rectifier \\ \hline V_{F} & I_{F} = 15 \ A, \ T_{j} = 25() \ ^{\circ}C & 1, 1 \\ \hline V_{(TO)} & T_{j} = 150 \ ^{\circ}C & 20 \\ \hline T_{r} & T_{j} = 150 \ ^{\circ}C & 20 \\ \hline R_{th(j:s)} & per \ diode & 2 \\ \hline F_{th(j:s)} & per \ diode & 2 \\ \hline Temperatur \ sensor \\ \hline R_{ts} & 5 \ ^{\circ}, \ T_{r} = 25 \ (100) \ ^{\circ}C \\ \hline Mechanical \ data \\ \hline \end{tabular}$	C _{ies}			-		nF			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	C _{oes}					nF			
	C _{res}	V _{CE} = 25 V _{GE} = 0 V, f = 1 MHz		9,1		nF			
	R _{th(j-s)}	1			1,6	K/W			
	t _{d(on)}	-				ns			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	t _r					ns			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	t _{d(off)}					ns			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	t _f					ns			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	E _{on}	inductive load		2		mJ			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	E _{off}			1,8		mJ			
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Diode - Ir								
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$V_F = V_{EC}$			1,6 (1,6)		V			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	V _(TO)			1 (0,8)		V			
	r _T	T _j = 25 °C (125) °C		40 (53)		mΩ			
	R _{th(j-s)}	per diode			2,1	K/W			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		-		25		А			
$\begin{tabular}{ c c c c c c c } \hline di_{F/dt} &= 900 \ A/\mu s \end{tabular} \\ \hline \textbf{Diode rectifier} \\ \hline V_F & I_F &= 15 \ A, \ T_j &= 25() \ ^{\circ}C & 1,1 & V_F & V_F & 1,1 & V_F & 0,9 & V_$				3		μC			
Diode rectifier V_F $I_F = 15 \text{ A}, T_j = 25() \text{ °C}$ 1,1 $V_{(TO)}$ $T_j = 150 \text{ °C}$ 0,9 r_T $T_j = 150 \text{ °C}$ 20 $R_{th(j-s)}$ per diode 2 Temperatur sensor R_{ts} 5 %, $T_r = 25 (100) \text{ °C}$ 5000(493) Mechanical data 100 \text{ °C} 100 \text{ °C}	Err	V _{GE} = 0 V, T _j = 125 °C		1,1		mJ			
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $		di _{F/dt} = 900 A/µs							
	Diode rec	tifier							
r_{T} T_{j} = 150 °C 20 r $R_{th(j-s)}$ per diode 2 P Temperatur sensor 2 P R_{ts} 5 %, T_r = 25 (100) °C 5000(493) P Mechanical data P P P P	V _F	I _F = 15 A, T _i = 25() °C		1,1		V			
r_T $T_j = 150 \ ^{\circ}C$ 20 r $R_{th(j-s)}$ per diode 2 r Temperatur sensor 2 r r 5 %, $T_r = 25 (100) \ ^{\circ}C$ 5000(493) r Mechanical data Note: Section 100 \ ^{\circ}C Section 100 \ ^{\circ}C	V _(TO)	T _i = 150 °C		0,9		V			
Temperatur sensor R_{ts} 5 %, T_r = 25 (100) °C5000(493)Mechanical data		T _i = 150 °C		20		mΩ			
Temperatur sensor R _{ts} 5 %, T _r = 25 (100) °C 5000(493) Mechanical data 5000(493) 5000(493)	R _{th(j-s)}	per diode			2	K/W			
R _{ts} 5 %, T _r = 25 (100) °C 5000(493) Mechanical data 5000 (493) 5000 (493)									
	R _{ts}	5 %, T _r = 25 (100) °C		5000(493)		Ω			
w 30	Mechanical data								
	w			30		g			
M _s Mounting torque 2,5 I	M _s	Mounting torque			2,5	Nm			

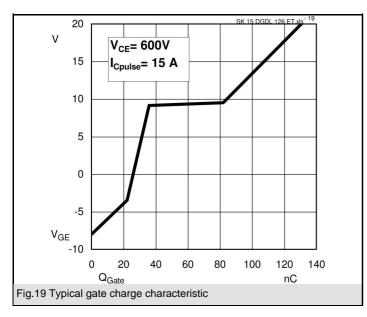


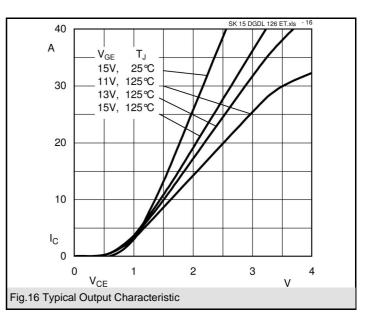
DGDL - ET

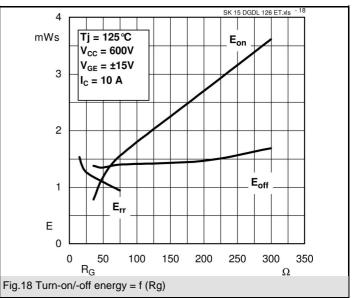
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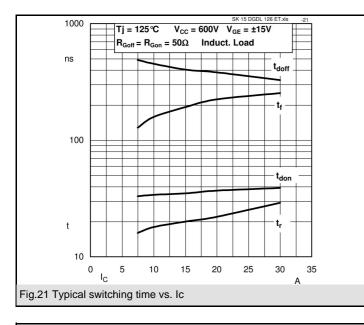


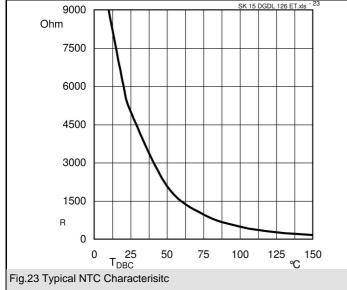


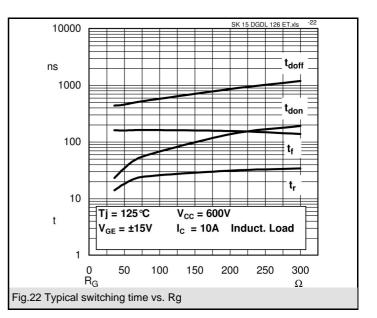


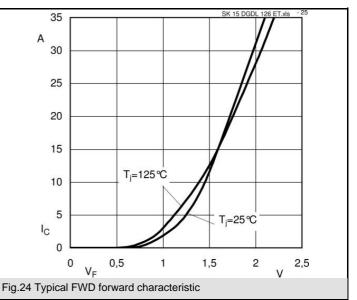


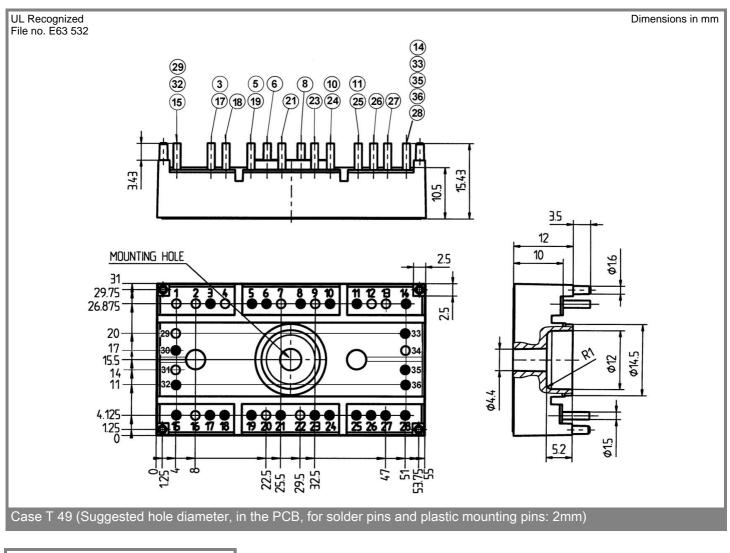


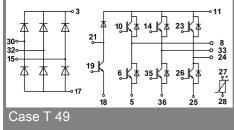












This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

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