

SEMITOP® 3

IGBT Module

SK20MLI066

Target Data

Features

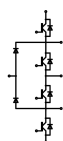
- Compact design
- One screw mounting
- Heat transfer and isolation through direct copper bonded aluminium oxide ceramic (DCB)
- Trench IGBT technology
- CAL technology FWD

Typical Applications*

- 3 Level Inverter
- UPS

Remarks

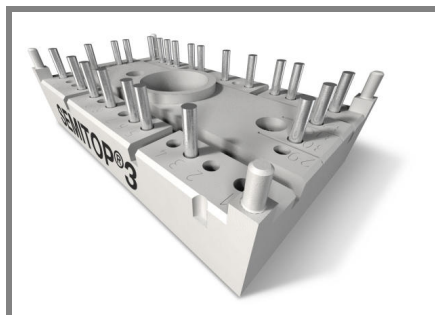
- Visol = 3000V AC, 1s, 50Hz
- Dynamic measure: DUT= IGBT (Gate pin 1) and Neutral Clamp Diode (Kathode pin 16) as free-wheeling diode



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Absolute Maximum Ratings			$T_s = 25\text{ }^{\circ}\text{C}$, unless otherwise specified	
Symbol	Conditions		Values	Units
IGBT				
V_{CES}	$T_j = 25\text{ }^{\circ}\text{C}$		600	V
I_C	$T_j = 175\text{ }^{\circ}\text{C}$	$T_s = 25\text{ }^{\circ}\text{C}$	30	A
		$T_s = 70\text{ }^{\circ}\text{C}$	24	A
I_{CRM}	$I_{CRM} = 2 \times I_{Cnom}$		40	A
V_{GES}			± 20	V
t_{psc}	$V_{CC} = 360\text{ V}$; $V_{GE} \leq 20\text{ V}$; $T_j = 150\text{ }^{\circ}\text{C}$ $V_{CES} < 600\text{ V}$		6	μs
Inverse Diode				
I_F	$T_j = 175\text{ }^{\circ}\text{C}$	$T_s = 25\text{ }^{\circ}\text{C}$	30	A
		$T_s = 70\text{ }^{\circ}\text{C}$	24	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$		40	A
I_{FSM}	$t_p = 10\text{ ms}$; half sine wave $T_j = 150\text{ }^{\circ}\text{C}$		95	A
Freewheeling Diode				
I_F	$T_j = 175\text{ }^{\circ}\text{C}$	$T_s = 25\text{ }^{\circ}\text{C}$	31	A
		$T_s = 70\text{ }^{\circ}\text{C}$	24	A
I_{FRM}	$I_{FRM} = 2 \times I_{Fnom}$		40	A
I_{FSM}	$t_p = 10\text{ ms}$; half sine wave $T_j = 150\text{ }^{\circ}\text{C}$		95	A
Module				
$I_{t(RMS)}$				A
T_{vj}			-40 ... +175	$^{\circ}\text{C}$
T_{stg}			-40 ... +125	$^{\circ}\text{C}$
V_{isol}	AC, 1 min.		2500	V

Characteristics			T _s = 25 °C, unless otherwise specified				
Symbol	Conditions		min.	typ.	max.	Units	
IGBT							
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 0,29 mA		5	5,8	6,5	V	
I _{CES}	V _{GE} = 0 V, V _{CE} = V _{CES} T _j = 25 °C		0,0011			mA	
I _{GES}	V _{CE} = 0 V, V _{GE} = 20 V T _j = 25 °C		300			nA	
V _{CE0}			T _j = 25 °C		0,9	1,1	V
			T _j = 150 °C		0,8	1	V
r _{CE}	V _{GE} = 15 V T _j = 25°C		T _j = 150°C		27,5	37,5	mΩ
					40	52,5	mΩ
V _{CE(sat)}	I _{Cnom} = 20 A, V _{GE} = 15 V T _j = 25°C _{chiplev.}		T _j = 150°C _{chiplev.}		1,45	1,85	V
					1,65	2,05	V
C _{ies}	V _{CE} = 25, V _{GE} = 0 V f = 1 MHz				1,1		nF
C _{oes}					0,071		nF
C _{res}					0,032		nF
t _{d(on)}	R _{Gon} = 33 Ω		V _{CC} = 300V I _C = 20A		21		ns
t _r					19		ns
E _{on}	R _{Goff} = 33 Ω		T _j = 150 °C V _{GE} = -7/+15 V		0,4		mJ
t _{d(off)}					230		ns
t _f					50		ns
E _{off}					1,07		mJ
R _{th(j-s)}	per IGBT		1,95				K/W



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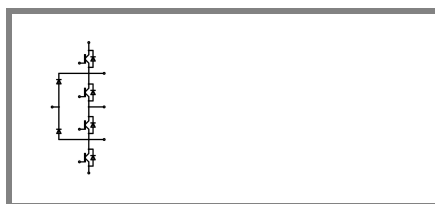
Remarks

- Visol = 3000V AC, 1s, 50Hz
- Dynamic measure: DUT= IGBT (Gate pin 1) and Neutral Clamp Diode (Kathode pin 16) as free-wheeling diode

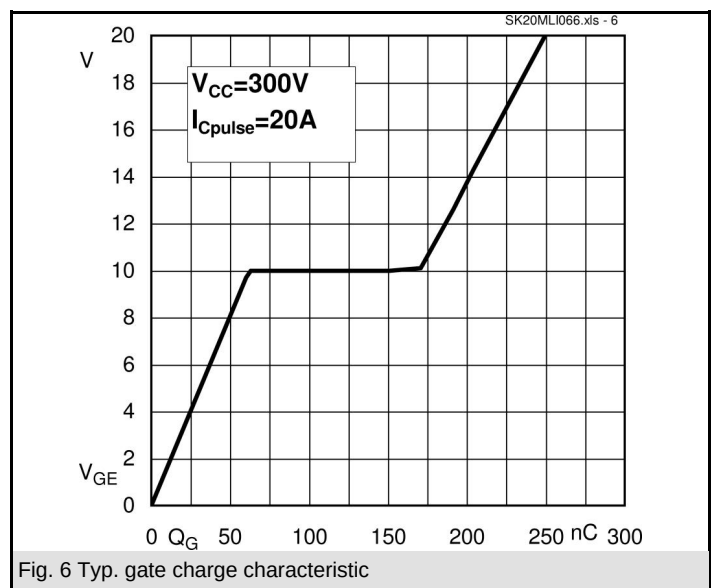
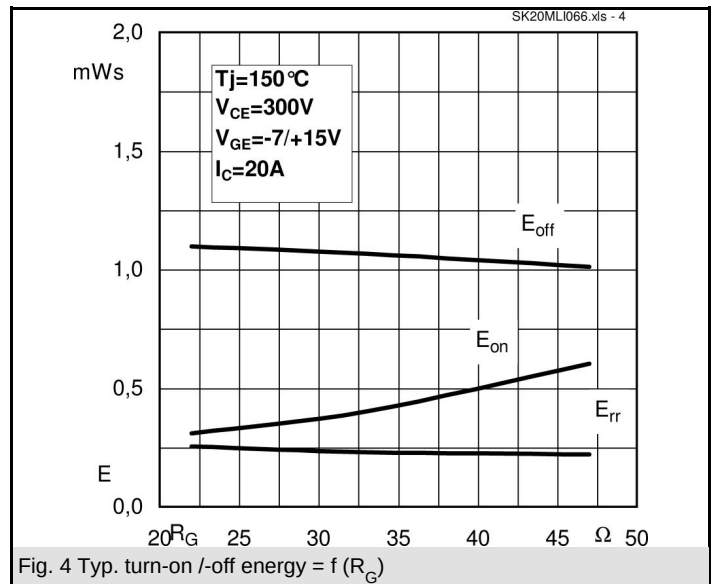
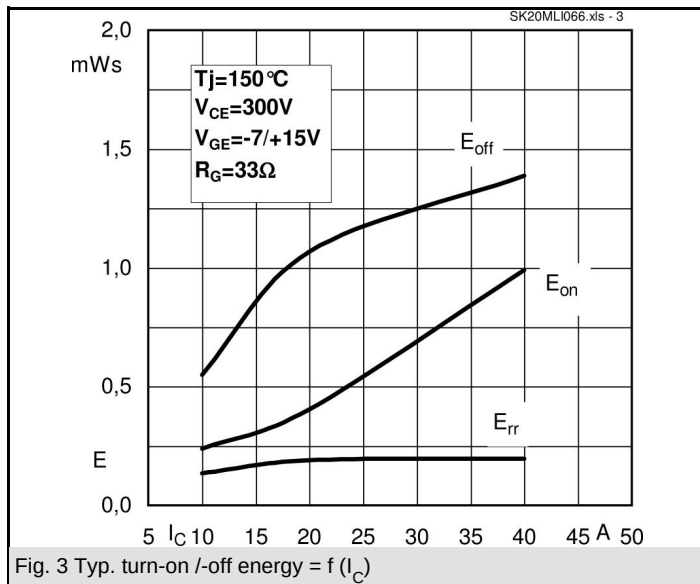
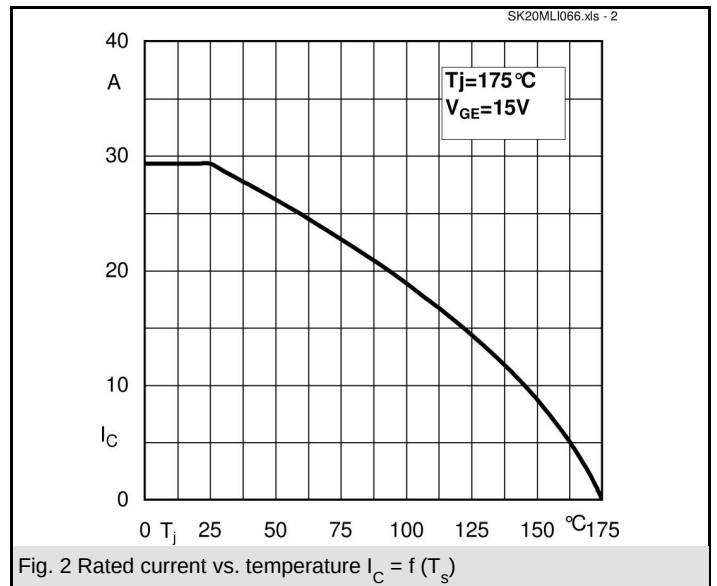
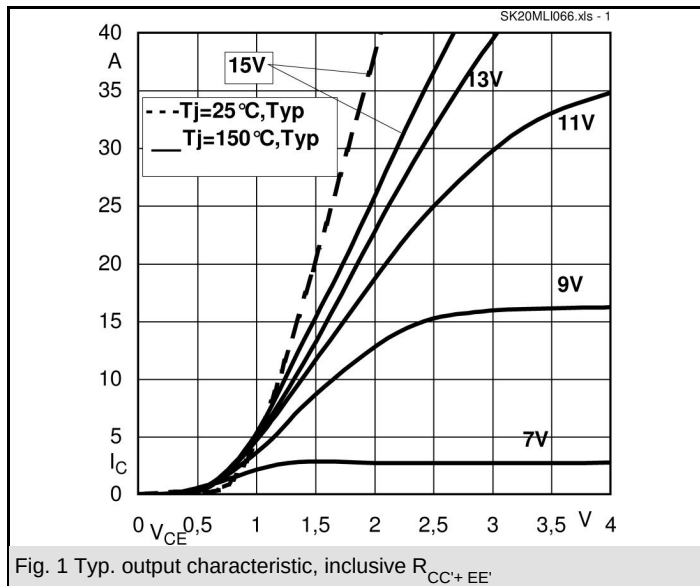
Characteristics						
Symbol	Conditions		min.	typ.	max.	Units
Inverse Diode (Antiparallel Diode)						
V _F = V _{EC}	I _{Fnom} = 20 A; V _{GE} = 0 V	T _j = 25 °C _{chiplev.}		1,6	1,9	V
		T _j = 150 °C _{chiplev.}		1,65	1,95	V
V _{F0}		T _j = 25 °C		1	1,1	V
		T _j = 150 °C		0,9	1	V
r _F		T _j = 25 °C		30	40	mΩ
		T _j = 150 °C		37,5	47,5	mΩ
I _{RRM}	I _F = 20 A	T _j = 150 °C				A
Q _{rr}	di/dt = -2000 A/μs					μC
E _{rr}	V _R = 300V			0,2		mJ
R _{th(j-s)D}	per diode			2,46		K/W
Freewheeling Diode (Neutral Clampo diode)						
V _F = V _{EC}	I _{Fnom} = 20 A; V _{GE} = 0 V	T _j = 25 °C _{chiplev.}		1,5		V
		T _j = 150 °C _{chiplev.}		1,5		V
V _{F0}		T _j = 25 °C		1		V
		T _j = 150 °C		0,9		V
r _F		T _j = 25 °C		20		V
		T _j = 150 °C		25		V
I _{RRM}	I _F = 20 A	T _j = 150 °C		20		A
Q _{rr}	di/dt = -2000 A/μs			1		μC
E _{rr}	V _R =300V			0,2		mJ
R _{th(j-s)FD}	per diode			2,46		K/W
M _s	to heat sink		2,25		2,5	Nm
w				30		g

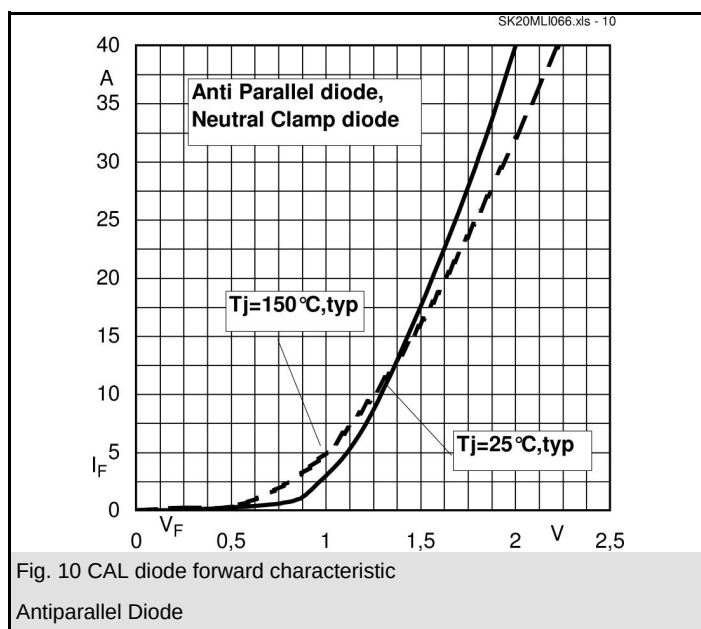
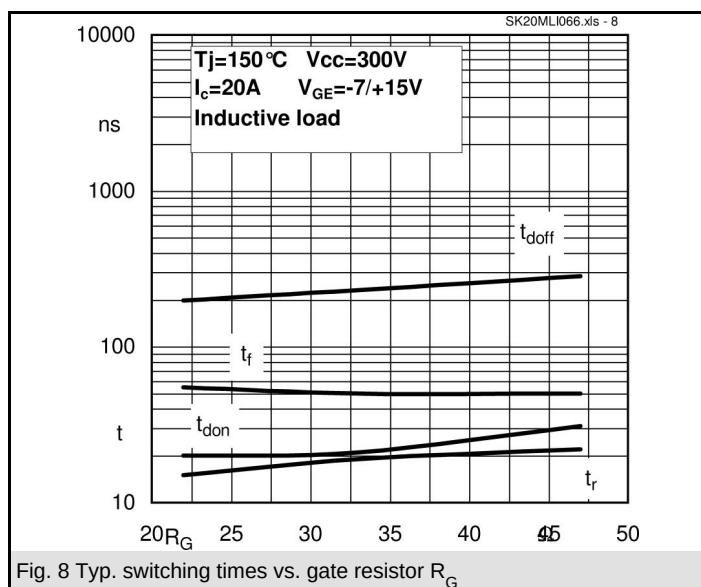
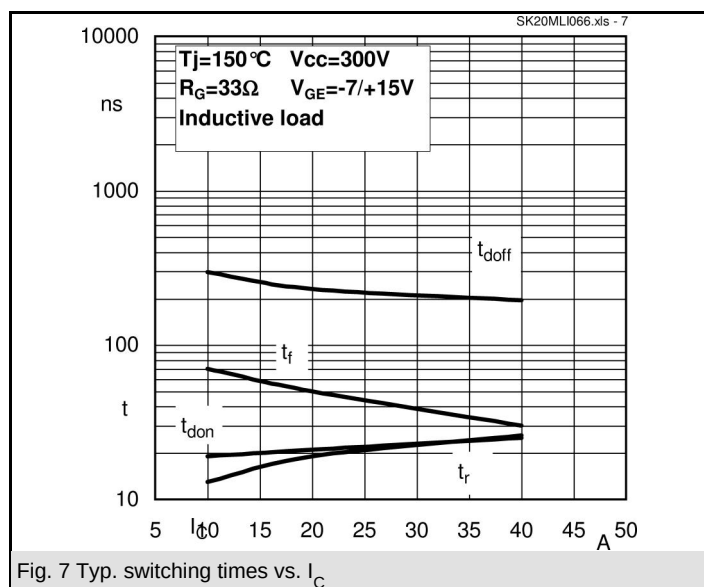
This is an electrostatic discharge sensitive device (ESDS), international standard IEC 60747-1, Chapter IX.

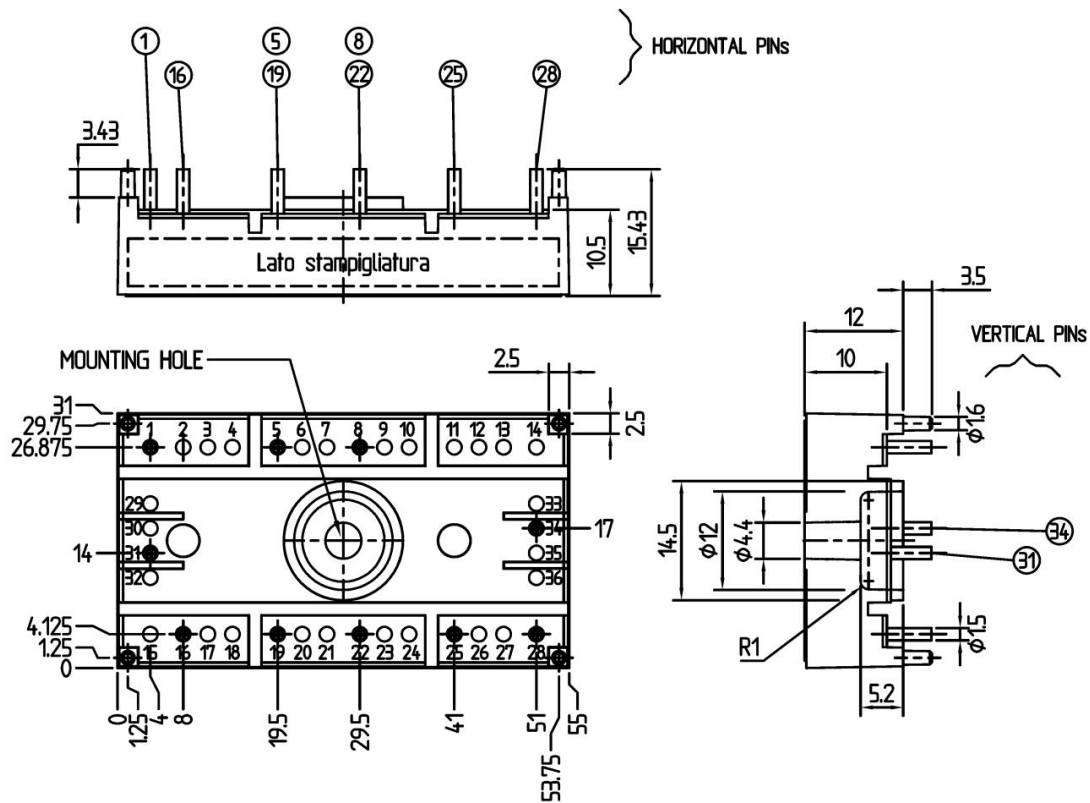
* The specifications of our components may not be considered as an assurance of component characteristics. Components have to be tested for the respective application. Adjustments may be necessary. The use of SEMIKRON products in life support appliances and systems is subject to prior specification and written approval by SEMIKRON. We therefore strongly recommend prior consultation of our personal.



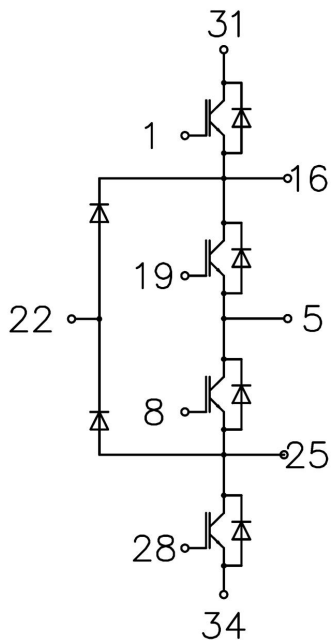
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Case T 76 (Suggested hole diameter, in the PCB, for solder pins and plastic mounting pins: 2mm)



Case T 76

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