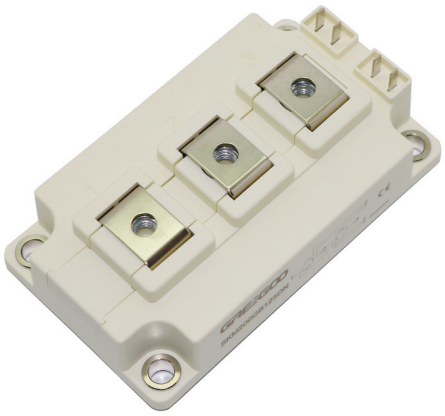
SKM200GB125DN

Features



►High short circuit capability,self limiting short circuit current
►IGBT CHIP(Highly rugged SPT+ design)
►VCE(sat) with positive temperature coefficient
►Ultra Low Loss, High ruggedness
►Free wheeling diodes with fast and soft reverse recovery

Applications

►AC motor control
►Inverter and power supplies
►Motion/servo control
►Photovoltaic/Fuel cell

Absolute Maximum Ratings Tc=25ºC, unless otherwise specified

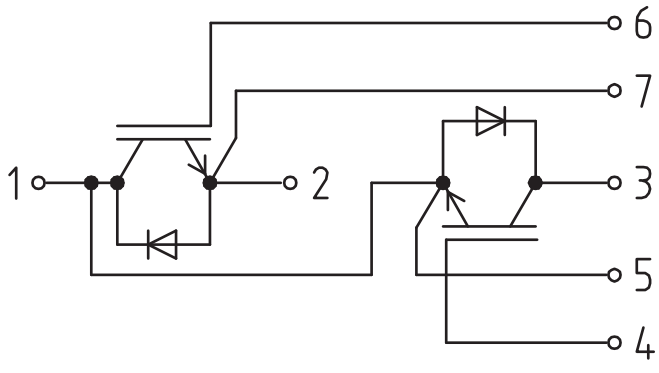
Symbol	Conditions		Values	Units
IGBT				
V_{CES}	Tj=25ºC		1200	V
I_C	Tj=150ºC	Tcase=25ºC	200	V
		Tcase=85ºC	160	V
I_{CRM}	I_{CRM}=2xI_{Cnom}		300	A
V_{GES}			±20	V
t_{psc}	V_{CC}=600V;V_{GE} ≤ 20V;V_{CES}<1200V	Tj=125ºC	10	μs
Inverse Diode				
I_F	Tj=150ºC	Tcase=25ºC	200	A
		Tcase=80ºC	130	A
I_{FRM}	I_{FRM}=2xI_{Fnom}		300	A
I_{FSM}	t_p=10ms; sin.	Tj=150ºC	1440	A
Module				
$I_{t(RMS)}$			500	A
T_{vj}			-40...+150	ºC
T_{stg}			-40...+150	ºC
V_{isol}	AC, 1min.		4000	V

Characteristics Tc=25ºC, unless otherwise specified

Symbol	Conditions		min.	typ.	max.	Units
IGBT						
$V_{GE(th)}$	V_{GE} = V_{CE}, I_C = 6mA		4.5	5.5	6.5	V
I_{CES}	V_{GE} = 0V, V_{CE} = V_{CES}	Tj=25ºC		0.15	0.45	mA
		Tj=125ºC				mA
V_{CE0}		Tj=25ºC		1.5	1.75	V
		Tj=125ºC				V
r_{CE}	V_{GE} = 15V	Tj=25ºC		12	14	mΩ
		Tj=125ºC				mΩ
$V_{CE(sat)}$	I_{Cnom} =150A, V_{GE}=15V	Tj=ºCchiplev.		3.3	3.85	V
C_{ies}	V_{CE} = 25V,V_{GE} = 0V	f =1 MHz		10	13	nF
C_{oes}				1.5	2	nF
C_{res}				0.8	1.2	nF
Q_G	V_{GE} = 0-+20V			1300		nC
R_{Gint}		Tj=ºC		2.5		Ω
$t_{d(on)}$	R_{Gon} =4Ω	V_{CC} = 600V I_C = 150A Tj=125ºC V_{GE} = ±15V		75		ns
t_r				36		ns
E_{on}				14		mJ
$t_{d(off)}$	R_{Goff} =4Ω			420		ns
t_f				25		ns
E_{off}						mJ
$R_{th(j-c)}$	per IGBT				0.09	K/W
Inverse Diode						
V_F = V_{EC}	I_{Fnom} = 150A; V_{GE}=0V	Tj=25ºCchiplev.		2	2.5	V
		Tj=125ºCchiplev.		1.8		V
V_{F0}		Tj=25ºC		1.1	1.2	V
		Tj=125ºC				V
r_F		Tj=25ºC		6	8.7	mΩ
		Tj=125ºC				mΩ
I_{RRM}	I_F=150A di/dt=5500A/µs V_{GE} = 0V; V_{CC}=600V	Tj=125ºC		230		A
Q_{rr}				24		µC
E_{rr}						mJ
$R_{th(j-c)D}$	per diode				0.25	K/W
Module						
L_{CE}				15	20	nH
$R_{CC'+EE'}$	res.terminal-chip	Tcase=25ºC		0.35		mΩ
		Tcase=125ºC		0.5		mΩ
$R_{th(c-s)}$	per module				0.038	K/W
Ms	to heat sink M6		3		5	Nm
Mt	to heat sink M6		2.5		5	Nm
W					325	g

Symbol	Conditions	Values	Units
Zth(j-c)I			
Rj	i = 1	60	mk/W
Rj	i = 2	23	mk/W
Rj	i = 3	5.9	mk/W
Rj	i = 4	1.1	mk/W
taui	i = 1	0.0744	s
taui	i = 2	0.0087	s
taui	i = 3	0.002	s
taui	i = 4	0.0015	s
Zth(j-c)D			
Rj	i = 1	160	mk/W
Rj	i = 2	67	mk/W
Rj	i = 3	20	mk/W
Rj	i = 4	3	mk/W
taui	i = 1	0.0536	s
taui	i = 2	0.0034	s
taui	i = 3	0.077	s
taui	i = 4	0.0003	s

Circuit Diagram



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Package Outline