

SKM400GB125DN

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 $T_c=25^{\circ}\text{C}$, unless otherwise specified

Symbol	Conditions	Values	Units	
IGBT				
V _{CES}	T _j =25°C	1200	V	
I _C	T _j =150°C	T _{case} =25°C	400	V
		T _{case} =85°C	300	V
I _{CRM}	I _{CRM} =2×I _{Cnom}	600	A	
V _{GES}		±20	V	
t _{psc}	V _{CC} =600V; V _{GE} ≤ 20V; V _{CES} <1200V	T _j =125°C	10	μs
Inverse Diode				
I _F	T _j =150°C	T _{case} =25°C	390	A
		T _{case} =80°C	260	A
I _{FRM}	I _{FRM} =2×I _{Fnom}	600	A	
I _{FSM}	t _p =10ms; sin.	T _j =150°C	2880	A
Module				
I _{t(RMS)}		500	A	
T _{vj}		-40...+150	°C	
T _{stg}		-40...+150	°C	
V _{isol}	AC, 1min.	4000	V	

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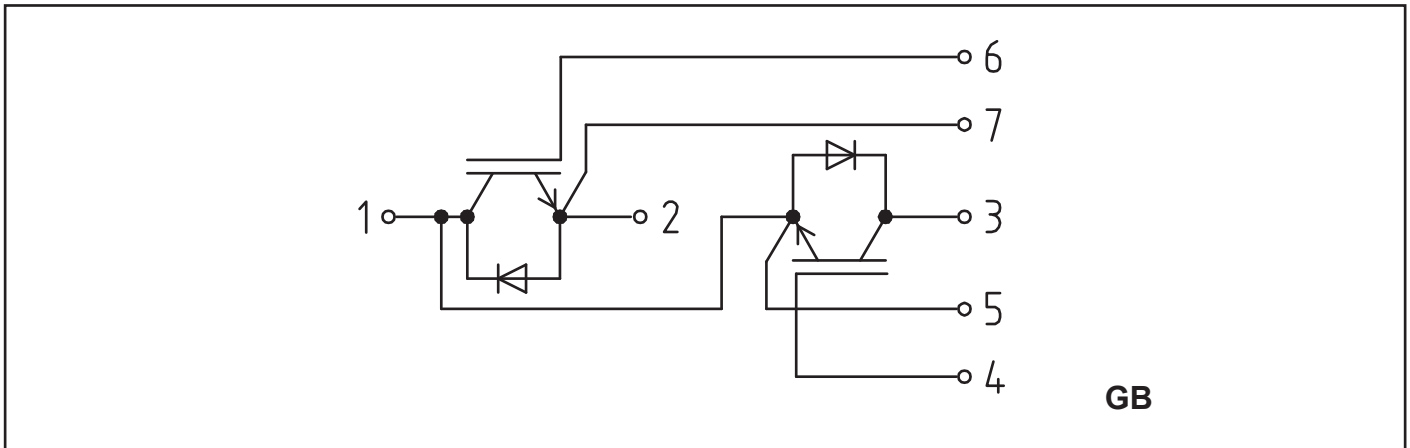
Characteristics T_c=25°C, unless otherwise specified

Symbol	Conditions	min.	typ.	max.	Units	
IGBT						
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 12mA	4.5	5.5	6.5	V	
I _{CES}	V _{GE} = 0V, V _{CE} = V _{CES}	T _j =25°C	0.15	0.45	mA	
		T _j =125°C			mA	
V _{CE0}		T _j =25°C	1.4		V	
		T _j =125°C	1.7		V	
r _{CE}	V _{GE} = 15V	T _j =25°C	6.3		mΩ	
		T _j =125°C	7.6		mΩ	
V _{CE(sat)}	I _{Cnom} = 300A, V _{GE} =15V		3.3	3.85	V	
C _{ies}	V _{CE} = 25V, V _{GE} = 0V	f = 1 MHz	22	30	nF	
C _{oes}			3.3	4	nF	
C _{res}			1.2	1.6	nF	
Q _G	V _{GE} = 0-+20V		2650		nC	
R _{Gint}		T _j =°C	1.25		Ω	
t _{d(on)}	R _{Gon} = 2Ω	V _{CC} = 600V I _C = 300A	70		ns	
t _r			50		ns	
E _{on}			17		mJ	
t _{d(off)}	R _{Goff} = 2Ω	T _j =125°C	500		ns	
t _f		V _{GE} = ±15V	32		ns	
E _{off}		18		mJ		
R _{th(j-c)}	per IGBT			0.05	K/W	
Inverse Diode						
V _F = V _{EC}	I _{Fnom} = 300A; V _{GE} =0V	T _j =25°Cchiplev.		2	2.5	V
		T _j =125°Cchiplev.		1.8		V
V _{F0}		T _j =25°C		1.1	1.2	V
		T _j =125°C				V
r _F		T _j =25°C		3	4.3	mΩ
		T _j =125°C				mΩ
I _{RRM}	I _F =300A	T _j =125°C		350		A
Q _{rr}	di/dt=8300A/μs		45		μC	
E _{rr}	V _{GE} = 0V; V _{CC} =600V		16		mJ	
R _{th(j-c)D}	per diode			0.125	K/W	
Module						
L _{CE}			15	20	nH	
R _{CC'+EE'}	res.terminal-chip	T _{case} =25°C		0.35		mΩ
		T _{case} =125°C		0.5		mΩ
R _{th(c-s)}	per module			0.038	K/W	
M _s	to heat sink M6	3		5	Nm	
M _t	to heat sink M6	2.5		5	Nm	
W				325	g	

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Symbol	Conditions	Values	Units
Z_{th(j-c)I}			
R _j	i = 1	36	mk/W
R _j	i = 2	10.5	mk/W
R _j	i = 3	3.0	mk/W
R _j	i = 4	0.5	mk/W
tau _i	i = 1	0.0744	s
tau _i	i = 2	0.0078	s
tau _i	i = 3	0.0016	s
tau _i	i = 4	0.0002	s
Z_{th(j-c)D}			
R _j	i = 1	75	mk/W
R _j	i = 2	38	mk/W
R _j	i = 3	10.6	mk/W
R _j	i = 4	1.4	mk/W
tau _i	i = 1	0.0386	s
tau _i	i = 2	0.0201	s
tau _i	i = 3	0.001	s
tau _i	i = 4	0.003	s

Circuit Diagram



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Package Outline

