

SKM300GB125DN

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	300	V
		T _{case} =85°C	210	V
I _{CRM}	I _{CRM} =2×I _{Cnom}	400	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	260	A
		T _{case} =80°C	180	A
I _{FRM}	I _{FRM} =2×I _{Fnom}	400	A	
I _{FSM}	t _p =10ms; sin.	T _j =150°C	1800	A
Module				
I _t (RMS)		500	A	
T _{vj}		-40...+150	°C	
T _{stg}		-40...+150	°C	
V _{isol}	AC, 1min.	4000	V	

SKM300GB125DN

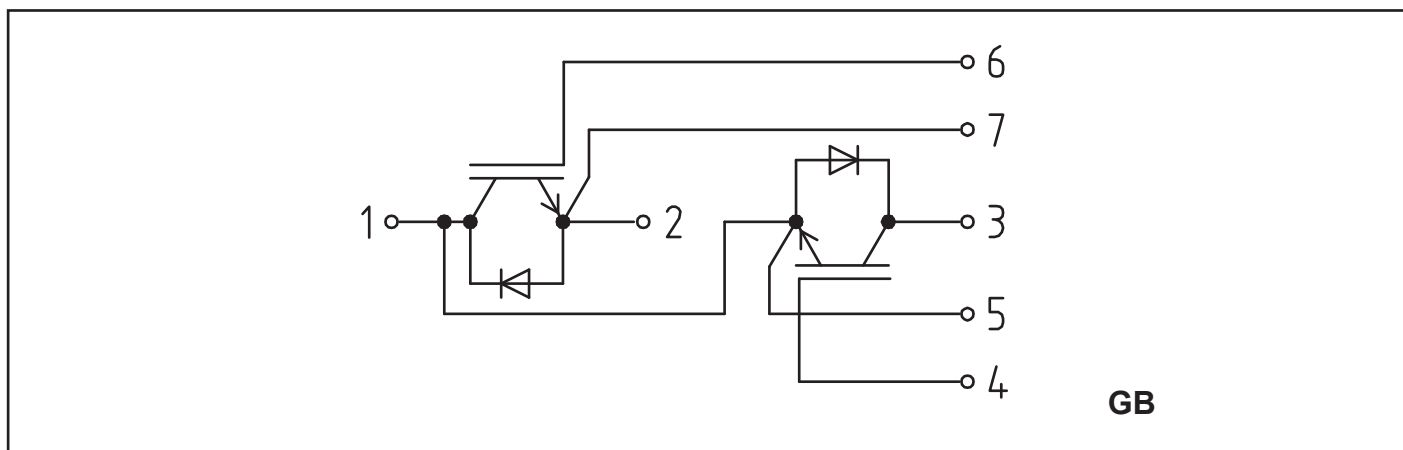
Characteristics T_c=25°C, unless otherwise specified

Symbol	Conditions	min.	typ.	max.	Units		
IGBT							
V _{GE(th)}	V _{GE} = V _{CE} , I _C = 8mA	4.5	5.5	6.5	V		
I _{CES}	V _{GE} = 0V, V _{CE} = V _{CES}	T _j =25°C		0.1	0.3	mA	
		T _j =125°C				mA	
V _{CE0}		T _j =25°C		1.5	1.75	V	
		T _j =125°C		1.7		V	
r _{CE}	V _{GE} = 15V	T _j =25°C		9	10.5	mΩ	
		T _j =125°C		11.5		mΩ	
V _{CE(sat)}	I _{Cnom} =200A, V _{GE} =15V			3.3	3.85	V	
C _{ies}	V _{CE} = 25V, V _{GE} = 0V	f =1 MHz		18	24	nF	
C _{oes}				2.5	3.2	nF	
C _{res}				1	1.3	nF	
Q _G	V _{GE} = 0-+20V		2000		nC		
R _{Gint}		T _j =°C		2.5		Ω	
t _{d(on)}	R _{Gon} =3Ω	V _{CC} = 600V I _C = 200A T _j =125°C V _{GE} = ±15V		130		ns	
t _r				40		ns	
E _{on}				16		mJ	
t _{d(off)}				460		ns	
t _f			R _{Goff} =3Ω		30		ns
E _{off}							mJ
R _{th(j-c)}	per IGBT				0.075	K/W	
Inverse Diode							
V _F = V _{EC}	I _{Fnom} = 200A; 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		4.5	6.5	mΩ	
		T _j =125°C				mΩ	
I _{RRM}	I _F =200A	T _j =125°C		340		A	
Q _{rr}	di/dt=8000A/μs			46		μC	
E _{rr}	V _{GE} = 0V; V _{CC} =600V					mJ	
R _{th(j-c)D}	per diode				0.18	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	

SKM300GB125DN

Symbol	Conditions	Values	Units
Z_{th(j-c)I}			
R _j	i = 1	53	mk/W
R _j	i = 2	18.5	mk/W
R _j	i = 3	3.1	mk/W
R _j	i = 4	0.4	mk/W
tau _i	i = 1	0.04	s
tau _i	i = 2	0.0189	s
tau _i	i = 3	0.0017	s
tau _i	i = 4	0.003	s
Z_{th(j-c)D}			
R _j	i = 1	115	mk/W
R _j	i = 2	52	mk/W
R _j	i = 3	11	mk/W
R _j	i = 4	2	mk/W
tau _i	i = 1	0.0366	s
tau _i	i = 2	0.0113	s
tau _i	i = 3	0.003	s
tau _i	i = 4	0.0002	s

Circuit Diagram



SKM300GB125DN

Package Outline

