



SKiM® 5

Superfast NPT-IGBT Modules

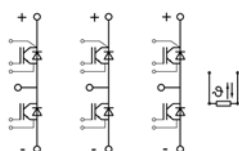
SKiM501GD063DM

Features

- NPT-IGBT with positive temperature coefficient of V_{CEsat}
- Short circuit, self limiting to $6 \times I_C$
- DBC substrate: AlN
- Integrated temperature sensor

Typical Applications*

- Resonant inverters up to 100kHz
- Inductive heating
- Electronic welders at f_{sw} up to 20kHz



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Absolute Maximum Ratings				
Symbol	Conditions		Values	Unit
IGBT				
V _{CES}			600	V
I _C	T _j = 150 °C	T _s = 25 °C	515	A
		T _s = 70 °C	392	A
I _{Cnom}			600	A
I _{CRM}	I _{CRM} = 2xI _{Cnom}		1200	A
V _{GES}			-20 ... 20	V
t _{psc}	V _{GE} ≤ 20 V V _{CES} ≤ 600 V	T _j = 125 °C	10	μs
T _j			-40 ... 150	°C
Inverse diode				
I _F	T _j = 150 °C	T _s = 25 °C	492	A
		T _s = 80 °C	320	A
I _{Fnom}			600	A
I _{FRM}	I _{FRM} = 2xI _{Fnom}		1200	A
I _{FSM}	t _p = 10 ms, sin 180°, T _j = 25 °C		4152	A
T _j			-40 ... 150	°C
Module				
I _{t(RMS)}	T _{terminal} = 80 °C		700	A
T _{stg}			-40 ... 125	°C
V _{isol}	AC sinus 50 Hz, t = 1 min		2500	V

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
IGBT						
V _{CE(sat)}	I _C = 600 A V _{GE} = 15 V chiplevel	T _j = 25 °C		2	2.5	V
		T _j = 125 °C		2.4	2.9	V
V _{CE0}	V _{GE} = 15 V	T _j = 25 °C		0.9	1	V
		T _j = 125 °C		0.8	0.9	V
r _{CE}		T _j = 25 °C		2.0	2.7	mΩ
		T _j = 125 °C		2.9	3.3	mΩ
V _{GE(th)}	V _{GE} =V _{CE} , I _C = 12 mA		4.5	5.5	6.5	V
I _{CES}	V _{GE} = 0 V	T _j = 25 °C		0.1	0.3	mA
	V _{CE} = 600 V					mA
C _{ies}	V _{CE} = 25 V V _{GE} = 0 V	f = 1 MHz		27.00		nF
C _{oes}		f = 1 MHz				nF
C _{res}		f = 1 MHz		2.40		nF
Q _G	V _{GE} = - 8 V...+ 20 V					nC
R _{Gint}	T _j = 25 °C			1.7		Ω
t _{d(on)}	V _{CC} = 300 V I _C = 600 A	T _j = 125 °C				ns
t _r		T _j = 125 °C				ns
E _{on}		T _j = 125 °C				mJ
t _{d(off)}		T _j = 125 °C				ns
t _f		T _j = 125 °C				ns
E _{off}		T _j = 125 °C				mJ
R _{th(j-s)}	per IGBT				0.09	K/W



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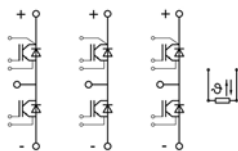
Features

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- Short circuit, self limiting to $6 \times I_C$
- DBC substrate: AlN
- Integrated temperature sensor

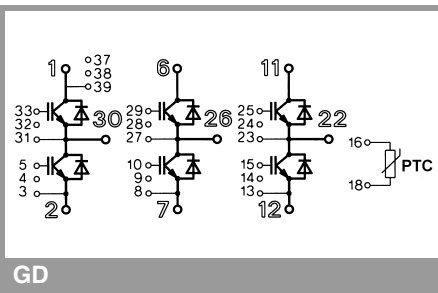
Typical Applications*

- Resonant inverters up to 100kHz
- Inductive heating
- Electronic welders at f_{sw} up to 20kHz

Characteristics						
Symbol	Conditions		min.	typ.	max.	Unit
Inverse diode						
V _F = V _{EC}	I _F = 600 A	T _J = 25 °C		1.5	1.7	V
	V _{GE} = 0 V chip	T _J = 125 °C		1.5	1.8	V
V _{F0}	V _{GE} = -15 V V _{CC} = 300 V	T _J = 25 °C	0.95	1.05	1.2	V
		T _J = 125 °C		0.9	1	V
r _F		T _J = 25 °C	0.3	0.7	0.9	mΩ
		T _J = 125 °C		1.0	1.3	mΩ
I _{RRM}						A
Q _{rr}	V _{GE} = -15 V V _{CC} = 300 V					μC
E _{rr}						mJ
R _{th(j-s)}	per diode				0.16	K/W
Module						
L _{CE}					20	nH
R _{CC'+EE'}	terminal-chip	T _s = 25 °C		0.9		mΩ
		T _s = 125 °C		1.1		mΩ
M _s	to heat sink (M4)		2		3	Nm
M _t		to terminals M6	4		5	Nm
						Nm
w					460	g
Temperature sensor						
R ₁₀₀	T _{Sensor} = 100 °C (R ₂₅ = 5 kΩ)			339		Ω
B _{100/125}	R _(T) = R ₁₀₀ exp[B _{100/125} (1/T-1/373)]; T[K];			4096		K



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