QMFS200R12TFF
1200V 200A IGBT Module

Electrical Features

■ Trench/Fieldstop IGBT

■ V_{CEsat} with positive Temperature Coefficient

■ Low V_{CEsat}

Typical Applications

■ Auxiliary inverters

■ Motor drives

■ Servo drives

Mechanical Features

■ High power density

■ Integrated NTC temperature sensor

■ Copper base plate

■ Solder contact technology

■ Standard housing

IGBT，Inverter

Maximum Rated Values				
Symbol	Item	Conditions	Rating	Unit
IGBT				
V_{CES}	Collector-emitter voltage	T_{vj}=25°C	1200	V
V_{GES}	Gate-emitter voltage	-	±20	V
I_C	Collector current,DC	T_C= 100°C ,T_{vj}= 175°C	200	A
I_{CRM}	Repetitive peak collector current	t_P= 1ms	400	A
P_{tot}	Total power dissipation	T_C=25°C ,T_{vj}= 175°C	1000	W

Characteristics Values						
Symbol	Item	Conditions	Values			Unit
IGBT			Min.	Typ.	Max.	
I_{CES}	Collector-emitter cut-off current	V_{CE}= 1200V,V_{GE}=0V,T_{vj}=25°C	-	-	1	mA
I_{GES}	Gate leakage current	V_{CE}=0V,V_{GE}=20V,T_{vj}=25°C	-	-	400	nA
$V_{GE(th)}$	Gate-emitter threshold voltage	I_C=7.4mA,V_{CE}=V_{GE},T_{vj}=25°C	5.2	5.77	6.5	V
V_{CEsat}	Collector-emitter saturation voltage	I_C=200A V_{GE}= 15V, T_{vj}=25°C	-	1.85	-	V
		T_{vj}= 125°C	-	-	-	
		T_{vj}= 150°C	-	-	-	
C_{ies}	Input capacitance	V_{CE}=25V,V_{GE}=0V	-	15.6	-	nF
C_{res}	Reverse transfer capacitance	f=1MHz,T_{vj}=25°C	-	0.48	-	
Q_G	Gate charge	V_{CC}=600V, I_C=200A V_{GE}=- 15...+ 15V,T_{vj}=25°C	-	1269	-	nC
R_g	Internal gate resistance	T_{vj}=25°C	-	0.84	-	Ω

Symbol	Item	Conditions					Unit
$t_{d(on)}$	Turn-on delay time	V_{CC}=600V I_C=200A V_{GE}=±15V $R_{G(on)}$= 1.6Ω $R_{G(off)}$= 1.6Ω	T_{vj}=25°C	-	339	-	ns
			T_{vj}=125°C	-	-	-	
			T_{vj}= 150°C	-	-	-	
t_r	Rise time		T_{vj}=25°C	-	66	-	
			T_{vj}=125°C	-	-	-	
			T_{vj}= 150°C	-	-	-	
$t_{d(off)}$	Turn-off delay time		T_{vj}=25°C	-	443	-	
			T_{vj}=125°C	-	-	-	
			T_{vj}= 150°C	-	-	-	
t_f	Fall time		T_{vj}=25°C	-	262	-	
			T_{vj}=125°C	-	-	-	
			T_{vj}= 150°C	-	-	-	
E_{on}	Turn-on energy (per pulse)		T_{vj}=25°C	-	4.04	-	mJ
			T_{vj}=125°C	-	-	-	
			T_{vj}= 150°C	-	-	-	
E_{off}	Turn-off energy (per pulse)		T_{vj}=25°C	-	19.1	-	
			T_{vj}=125°C	-	-	-	
			T_{vj}= 150°C	-	-	-	
SC data	Short-circuit current	V_{CC}=600V,V_{GE}≤ 15V,T_{vj}=25°C V_{CES}≤ 1200V,t_P≤ 10μs		-	1765	-	A
R_{thJC}	Thermal resistance,junction to case	Per IGBT		-	-	0.15	K/W
R_{thCH}	Thermalresistance,case to heatsink	Per IGBT λgrease= 1W/(m·K)		-	0.085	-	K/W
Tvjop	Temperature under switching conditions			-40		150	°C

Diode，Inverter
Maximum Rated Values

Symbol	Item	Conditions	Rating	Unit
V_{RRM}	Repetitive peak reverse voltage	T_{vj}=25°C	1200	V
I_F	Forward current,DC		200	A
I_{FRM}	Repetitive peak forward current	t_P= 1ms	400	A
I^2t	I^2t-value	V_R=0V,t_P= 10ms,T_{vj}= 150°C	5000	A^2s

Characteristic Values

Symbol	Item	Conditions					Unit
V_F	Forward voltage	I_F=200A V_{GE}=0V	T_{vj}=25°C	-	1.97	-	V
			T_{vj}= 125°C	-	-	-	
			T_{vj}= 150°C	-	-	-	
I_{RM}	Peak reverse recovery current	V_R=600V I_F=200A V_{GE}=- 15V	T_{vj}=25°C	-	189	-	A
			T_{vj}= 125°C	-	-	-	
			T_{vj}= 150°C	-	-	-	
t_{rr}	Reverse recovery time		T_{vj}=25°C	-	162	-	ns
			T_{vj}= 125°C	-	-	-	
			T_{vj}= 150°C	-	-	-	
Q_r	Recovered charge		T_{vj}=25°C	-	17.53	-	μC
			T_{vj}= 125°C	-	-	-	
			T_{vj}= 150°C	-	-	-	

E_{rec}	Reverse recovery energy		$T_{vj}=25°C$	-	10 38	-	mJ
			$T_{vj}=125°C$	-	-	-	
			$T_{vj}=150°C$	-	-	-	
R_{thJC}	Thermal resistance, junction to case	per diode		-	-	0.26	K/W
R_{thCH}	Thermal resistance, case to heatsink	per diode，λ_{grease}= 1 W/(m・K)		-	0.15	-	K/W
Tvjop	Temperature under switching conditions			-40		150	°C

Note:

IGBT electrical characteristics according to IEC 60747 – 9

Diode electrical characteristics according to IEC 60747 – 2

Module

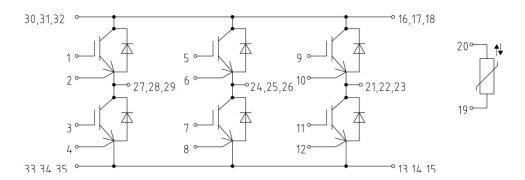| Symbol	Item	Conditions	Rating	Unit
V_{ISOL}	Isolation voltage	Terminals to baseplate，RMS,f=50Hz,t=1min	2500	V
$T_{vj\ max}$	Maximum junction temperature	-	175	°C
$T_{vj\ op}$	Operatingjunction temperature	Continuous operationg(underswitching)	-40~150	°C
T_{stg}	Storage temperature	-	-40~125	°C

Symbol	Item	Conditions	Values			Unit
			Min.	Typ.	Max.	
M	Mountingtorqueformodulmounting	-	3	-	6	Nm
d_s	Creepage distance	Terminal to terminal	-	-	-	mm
		Terminal to base plate	-	10	-	
d_a	Clearance	Terminal to terminal	-	-	-	mm
		Terminal to base plate	-	7.5	-	
m	Weight	-	-	290	-	g

NTC Thermistor Characteristics

Symbol	Item	Conditions	Values			Unit
			Min.	Typ.	Max.	
R_{25}	Rated resistance	$T_C=25°C$	-	5	-	kΩ
$\Delta R/R$	Deviation of resistance	$T_C= 100°C$,$R_{100}=493\Omega$	-5	-	5	%
P_{25}	Power dissipation	$T_C=25°C$	-	-	20	mW
$B_{25/50}$	B-constant	$R_2=R_{25}exp[B_{25/50}(1/T_2- 1/(298.15K))$	-	3375	-	K
$B_{25/80}$	B-constant	$R_2=R_{25}exp[B_{25/80}(1/T_2- 1/(298.15K))$	-	3411	-	
$B_{25/100}$	B-constant	$R_2=R_{25}exp[B_{25/100}(1/T_2- 1/(298.15K))$	-	3433	-	

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Cricuit Diagram

Package Outlines

方框内尺寸位置度 ⊕ Ø0.5

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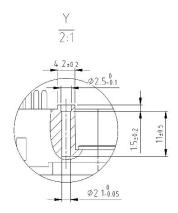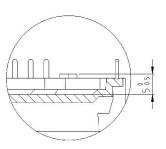## Terms & Conditions of usage

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