JJMICROELECTRONICS

62mm Module with 1200V 200A Trench FS IGBT

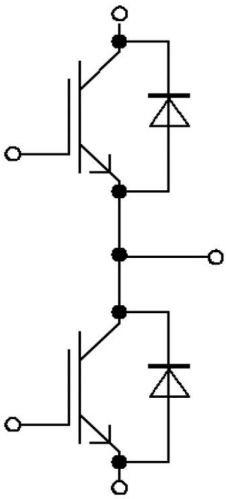
JA200Z12SH1

Key performance:

- V_{CE}=1200V
- I_C=200A@T_C=100℃
- $V_{CE(sat)}$=1.7 V

Features:

- Low V_{CEsat}.
- Low switching losses.
- Low stray inductance design.
- Positive V_{CEsat} temperature coefficient.



Benefits:

- High efficiency for application.
- Excellent current sharing in parallel operation.
- RoHS compliant.

Applications:

- Welding machines
- High frequency switching converters

Maximum rated values , IGBT

Parameter	Conditions	Symbol	Values	Unit
Collector-emitter voltage	T_{vj} = 25°C	V_{CES}	1200	V
Continuous collector current	T_C = 100°C, $T_{vj\ max}$ = 175°C	I_C	200	A
Repetitive peak collector current	t_P = 1 ms	I_{CRM}	400	A
Total power dissipation	T_C = 25°C, $T_{vj\ max}$ = 175°C	P_{tot}	1150	W
Gate-emitter peak voltage		V_{GES}	±20	V

Characteristic values , IGBT

Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max.	
Collector-emitter saturation voltage	I_C = 200A, V_{GE} = 15 V T_{vj} = 25°C	V_{CEsat}	-	1.7	-	V
Gate threshold voltage	I_C = 1.5 mA, V_{CE} = V_{GE} T_{vj} = 25°C	V_{GEth}	-	5.7	-	V
Gate charge	V_{GE} = -15 / 15 V	Q_G	-	1.85	-	µC
Input capacitance	f = 1 MHz, T_{vj} = 25°C, V_{CE} = 25 V, V_{GE} = 0 V	C_{ies}	-	15.2	-	nF
Reverse transfer capacitance		C_{res}	-	0.65	-	nF
Collector-emitter leakage current	V_{CE} = 1200 V, V_{GE} = 0 V, T_{vj} = 25°C	I_{CES}	-	-	1.0	mA
Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C	I_{GES}	-	-	100	nA
Turn-on delay time, inductive load	I_C = 200A, V_{CE} = 600 V V_{GE} = -15 / 15 V , R_G = 4.5Ω T_{vj} = 25°C	$t_{d(on)}$	-	155	-	ns
Rise time, inductive load		t_r	-	90	-	ns
Turn-off delay time, inductive load		$t_{d(off)}$	-	330	-	ns
Fall time, inductive load		t_f	-	95	-	ns
Turn-on energy loss per pulse		E_{on}	-	11	-	mJ
Turn-off energy loss per pulse		E_{off}	-	10	-	mJ
Thermal resistance, junction to case	per IGBT	R_{thJC}	-	-	0.13	K/W
Thermal resistance, case to heatsink	per IGBT	R_{thCH}	-	0.04	-	K/W
Temperature under switching conditions		$T_{vj\ op}$	-40	-	150	°C

Maximum rated values , Diode

Parameter	Conditions	Symbol	Values	Unit
Repetitive peak reverse voltage	T_{vj} = 25°C	V_{RRM}	1200	V
Continuous DC forward current		I_F	200	A
Repetitive peak forward current	t_P = 1 ms	I_{FRM}	400	A

Characteristic values , Diode

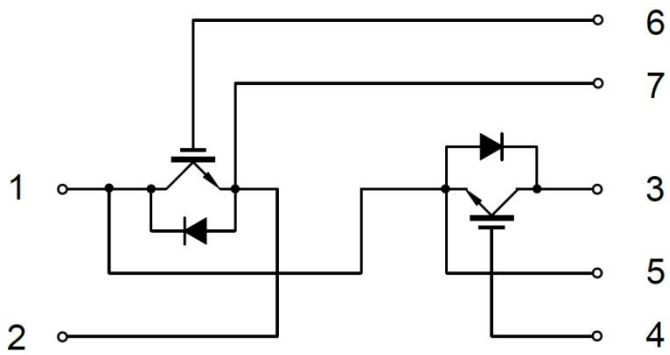
Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max.	
Forward voltage	I_F = 200A, V_{GE} = 0 V T_{vj} = 25°C	V_F	-	2.0	-	V
Peak reverse recovery current	I_F = 200 A, - d_{iF}/d_t = 1800 A/µs V_R = 600 V, V_{GE} = -15 V R_G = 4.5Ω T_{vj} = 25°C	I_{RR}	-	50	-	A
Recovered charge		Q_{RR}	-	16	-	µC
Reverse recovery energy		E_{rec}	-	2.6	-	mJ
Thermal resistance, junction to case	per diode	R_{thJC}	-	-	0.2	K/W
Thermal resistance, case to heatsink	per diode	R_{thCH}	-	0.05	-	K/W
Temperature under switching conditions		$T_{vj\ op}$	-40	-	150	°C

Module characteristic values

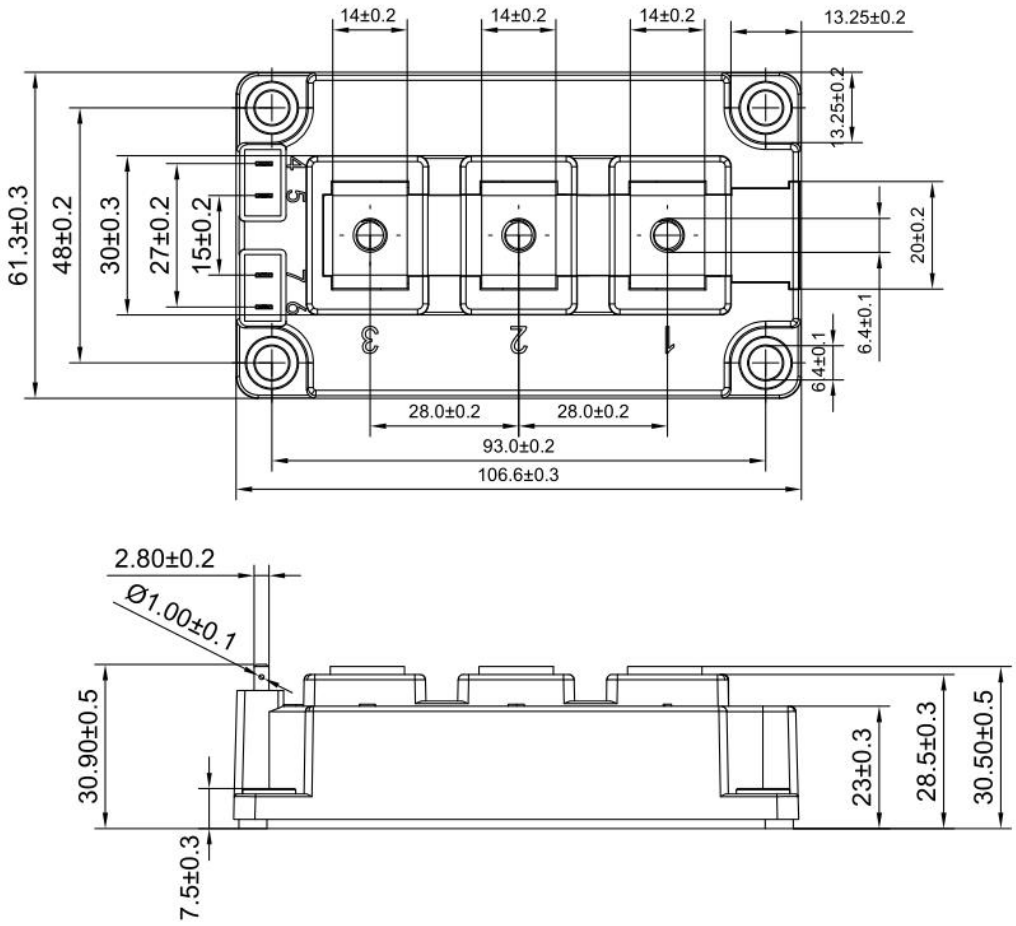
Parameter	Conditions	Symbol	Values	Unit
Isolation test voltage	RMS, f = 50 Hz, t = 1 min.	V_{ISOL}	2.5	kV
Internal isolation	basic insulation (class 1, IEC 61140)		Al_2O_3	
Creepage distance	terminal to heatsink terminal to terminal		29 23	mm
Clearance	terminal to heatsink terminal to terminal		23 21	mm
Comperative tracking index		CTI	> 400	

Parameter	Conditions	Symbol	Values			Unit
			Min.	Typ.	Max.	
Stray inductance module		L_{sCE}	-	20	-	nH
Module lead resistance, terminals - chip	T_C = 25°C, per switch	$R_{CC'+EE'}$	-	0.7	-	mΩ
Storage temperature		Tstg	-40	-	125	°C
Mounting torque	Screw:M6	M	3	-	6	Nm
Weight		G	-	345	-	g

Circuit diagram



Package outlines (mm)



Revision history

Date	Revision	Changes
Jan 11, 2025	Rev 1.0	Release of the preliminary datasheet.

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