

Type: YZPST-200B120F23

IGBT Power Module

$$V_{CE}=1200V \quad I_C = 200A$$

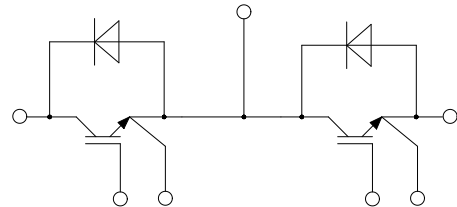
Applications

- Inverter for motor drive
- AC and DC servo drive amplifier
- UPS (Uninterruptible Power Supplies)
- Soft switching welding machine



Features

- Low $V_{ce(sat)}$ with Trench Field-stop technology
- $V_{ce(sat)}$ with positive temperature coefficient
- Including fast & soft recovery anti-parallel FWD
- High short circuit capability(10us)
- Low inductance module structure
- Maximum junction temperature 175°C



Equivalent Circuit Schematic

● Absolute Maximum Ratings

Parameter	Symbol	Conditions	Value	Unit
Collector-Emitter Voltage	V_{CES}	$V_{GE}=0V, I_C=1mA, T_{vj}=25^{\circ}C$	1200	V
Continuous Collector Current	I_C	$T_c=100^{\circ}C$	200	A
Peak Collector Current	I_{CRM}	$t_p=1ms$	400	A
Gate-Emitter Voltage	V_{GES}	$T_{vj}=25^{\circ}C$	± 20	V
Total Power Dissipation (IGBT-inverter)	P_{tot}	$T_c=25^{\circ}C$ $T_{vjmax}=175^{\circ}C$	695	W

● IGBT Characteristics

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=3.2mA, T_{vj}=25^{\circ}C$	5.1	5.8	6.3	V
Collector-Emitter Cut-off Current	I_{CES}	$V_{CE}=650V, V_{GE}=0V, T_{vj}=25^{\circ}C$			1.0	mA
		$V_{CE}=650V, V_{GE}=0V, T_{vj}=125^{\circ}C$			5.0	mA
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=200A, V_{GE}=15V, T_{vj}=25^{\circ}C$		1.45	1.95	V
		$I_C=200A, V_{GE}=15V, T_{vj}=125^{\circ}C$		1.65		V
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V,$ $f=1MHz, T_{vj}=25^{\circ}C$		12.3		nF
Reverse Transfer Capacitance	C_{res}			0.37		nF
Internal Gate Resistance	R_{gint}			1.0		Ω
Turn-on Delay Time	$t_{d(on)}$	$I_C=200A$ $V_{CE}=300V$ $V_{GE}=\pm 15V$ $R_G=3.6\Omega$ $T_{vj}=25^{\circ}C$		48		Ns
Rise Time	t_r			48		Ns
Turn-off Delay Time	$t_{d(off)}$			348		Ns
Fall Time	t_f			58		Ns
Energy Dissipation During Turn-on Time	E_{on}			2.32		mJ
Energy Dissipation During Turn-off Time	E_{off}			5.85		mJ
Turn-on Delay Time	$t_{d(on)}$	$I_C=200A$ $V_{CE}=300V$ $V_{GE}=\pm 15V$ $R_G=3.6\Omega$ $T_{vj}=125^{\circ}C$		48		Ns
Rise Time	t_r			48		Ns
Turn-off Delay Time	$t_{d(off)}$			364		Ns
Fall Time	t_f			102		Ns
Energy Dissipation During Turn-on Time	E_{on}			3.08		mJ
Energy Dissipation During Turn-off Time	E_{off}			7.92		mJ
SC Data	I_{sc}	$T_p \leq 10\mu s, V_{GE}=15V, T_{vj}=150^{\circ}C,$ $V_{cc}=300V, V_{CEM} \leq 650V$		1000		A

● Diode Characteristics

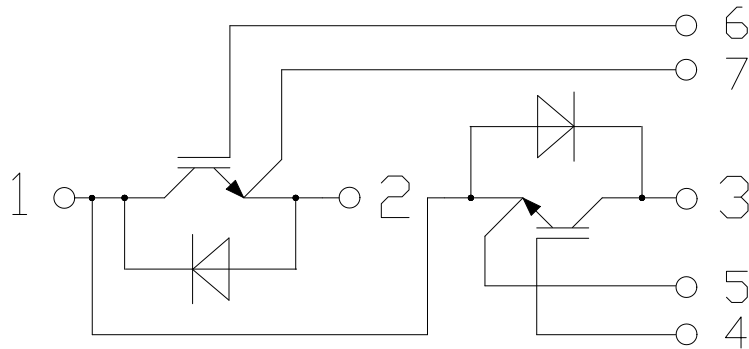
Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Diode DC Forward Current	I_F	$T_c=100^{\circ}\text{C}$		200		A
Diode Peak Forward Current	I_{FRM}			400		A
Forward Voltage	V_F	$I_F=200\text{A}, T_{vj}=25^{\circ}\text{C}$		1.55	1.95	V
		$I_F=200\text{A}, T_{vj}=125^{\circ}\text{C}$		1.50		V

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Recovered Charge	Q_{rr}	$I_F=200\text{ A}$ $V_R=300\text{V}$ $-di_F/dt=4200\text{A/us}$ $T_{vj}=25^{\circ}\text{C}$		8.05		μC
Peak Reverse Recovery Current	I_{rr}			148		A
Reverse Recovery Energy	E_{rec}			1.94		mJ
Recovered Charge	Q_{rr}	$I_F=200\text{ A}$ $V_R=300\text{V}$ $-di_F/dt=4200\text{A/us}$ $T_{vj}=125^{\circ}\text{C}$		16.9		μC
Peak Reverse Recovery Current	I_{rr}			186		A
Reverse Recovery Energy	E_{rec}			3.75		mJ

● **Module Characteristics** $T_C=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Isolation voltage	V_{isol}	$t=1\text{min}, f=50\text{Hz}$	2500			V
Maximum Junction Temperature	T_{jmax}				150	$^{\circ}\text{C}$
Operating Junction Temperature	$T_{\text{vj op}}$		-40		125	$^{\circ}\text{C}$
Storage Temperature	T_{stg}		-40		125	$^{\circ}\text{C}$
Junction-to Case	$R_{\theta \text{jc}}$	per IGBT-inverter			0.19	K/W
		per Diode-inverter			0.31	K/W
Case to Sink	$R_{\theta \text{cs}}$	Conductive grease applied		0.085		K/W
Module Electrodes Torque	M_t	Recommended(M5)	2.5		5.0	N·m
Module-to-Sink Torque	M_s	Recommended(M6)	3.0		5.0	N·m
Weight of Module	G			150		g

● Circuit Diagram



● Package Dimensions

Dimensions in Millimeters

