

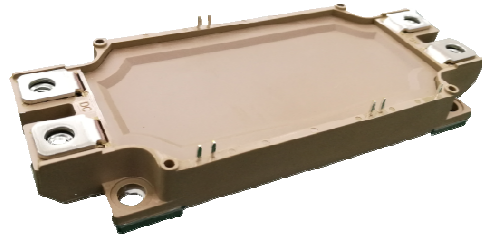
YYPST-600B120E53

IGBT Power Module

$V_{CE}=1200V$ $I_C=600A$

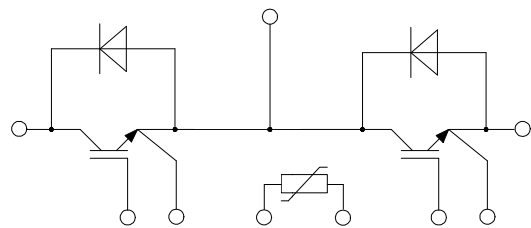
Applications

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



Features

- Low $V_{ce(sat)}$ with SPT+ technology
- $V_{ce(sat)}$ with positive temperature coefficient
- Including fast & soft recovery anti-parallel FWD
- High short circuit capability(10us)
- Low inductance module structure



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	$T_c=100^{\circ}C$	600	A
Peak Collector Current	I_{CRM}	$I_{CRM}=2I_C$	1200	A
Gate-Emitter Voltage	V_{GES}	$T_{vj}=25^{\circ}C$	± 20	V
Total Power Dissipation (IGBT-inverter)	P_{tot}	$T_c=25^{\circ}C$ $T_{vjmax}=175^{\circ}C$	3750	W

● IGBT Characteristics

Parameter	Symbol	Conditions	Value			Unit	
			Min.	Typ.	Max.		
Gate-emitter Threshold Voltage	$V_{GE(th)}$	$V_{GE}=V_{CE}, I_C=3mA, T_{vj}=25^{\circ}C$	5.0	5.8	6.5	V	
Collector-Emitter Cut-off Current	I_{CES}	$V_{CE}=1200V, V_{GE}=0V, T_{vj}=25^{\circ}C$			1.0	mA	
		$V_{CE}=1200V, V_{GE}=0V, T_{vj}=125^{\circ}C$			5.0	mA	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$I_C=600A, V_{GE}=15V, T_{vj}=25^{\circ}C$		1.70		V	
		$I_C=600A, V_{GE}=15V, T_{vj}=125^{\circ}C$		2.00		V	
Input Capacitance	C_{ies}	$V_{CE}=25V, V_{GE}=0V, f=1MHz, T_{vj}=25^{\circ}C$		43.1		nF	
Output Capacitance	C_{oes}			2.25		nF	
Reverse Transfer Capacitance	C_{res}			1.95		nF	
Internal Gate Resistance	R_{gint}			1.25		Ω	
Turn-on Delay Time	$t_{d(on)}$	$I_C=600A, V_{CE}=600V, V_{GE}=\pm 15V, R_G=1.2\Omega, T_{vj}=25^{\circ}C$		250		ns	
Rise Time	t_r			88		ns	
Turn-off Delay Time	$t_{d(off)}$			560		ns	
Fall Time	t_f			131		ns	
Energy Dissipation During Turn-on Time	E_{on}			33.1		mJ	
Energy Dissipation During Turn-off Time	E_{off}			57.8		mJ	
Turn-on Delay Time	$t_{d(on)}$		$I_C=600A, V_{CE}=600V, V_{GE}=\pm 15V, R_G=1.2\Omega, T_{vj}=125^{\circ}C$		300		ns
Rise Time	t_r				102		ns
Turn-off Delay Time	$t_{d(off)}$				650		ns
Fall Time	t_f				180		ns
Energy Dissipation During Turn-on Time	E_{on}			50.2		mJ	
Energy Dissipation During Turn-off Time	E_{off}			87.8		mJ	
SC Data	I_{sc}	$T_p \leq 10\mu s, V_{GE}=15V, T_{vj}=150^{\circ}C, V_{ce}=600V, V_{CEM} \leq 1200V$			2400		A

● Diode Characteristics

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Diode DC Forward Current	I_F	$T_c=100^\circ\text{C}$		600		A
Diode Peak Forward Current	I_{FRM}	$I_{FRM}=2I_F$		1200		A
Forward Voltage	V_F	$I_F=600\text{A}, T_{vj}=25^\circ\text{C}$		1.65		V
		$I_F=600\text{A}, T_{vj}=125^\circ\text{C}$		1.75		V
Recovered Charge	Q_{rr}	$I_F=600\text{A}$ $V_R=600\text{V}$ $-di_F/dt=6000\text{A/us}$ $T_{vj}=25^\circ\text{C}$		60.3		μC
Peak Reverse Recovery Current	I_{rr}			415		A
Reverse Recovery Time	t_{rr}			260		ns
Reverse Recovery Energy	E_{rec}			28.1		mJ
Recovered Charge	Q_{rr}	$I_F=600\text{A}$ $V_R=600\text{V}$ $-di_F/dt=6000\text{A/us}$ $T_{vj}=125^\circ\text{C}$		114		μC
Peak Reverse Recovery Current	I_{rr}			543		A
Reverse Recovery Time	t_{rr}			380		ns
Reverse Recovery Energy	E_{rec}			51.8		mJ

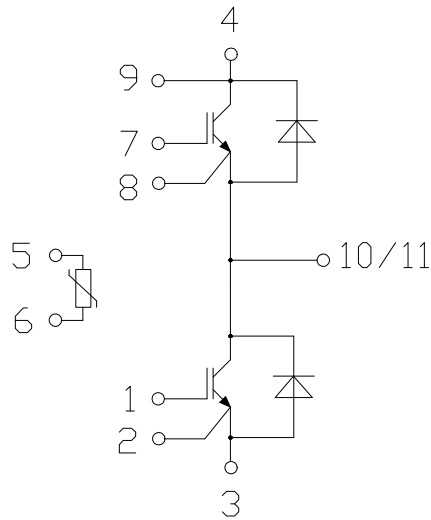
● NTC-Thermistor
Characteristic values

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Rated Resistance	R_{25}			5.0		$k\Omega$
Deviation of R100	$\Delta R/R$	$T_C=100, R_{100}=493.3\Omega$	-5		5	%
Power Dissipation	P_{25}			20.0		mW
B-value	$B_{25/50}$	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15\text{K}))]$		3375		K

● 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}				175	$^{\circ}\text{C}$
Operating Junction Temperature	$T_{\text{vj op}}$		-40		150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}		-40		125	$^{\circ}\text{C}$
Junction-to Case	$R_{\theta \text{jc}}$	per IGBT-inverter			0.040	K/W
		per Diode-inverter			0.071	K/W
Case to Sink	$R_{\theta \text{cs}}$	Conductive grease applied		0.009		K/W
Module Electrodes Torque	M_t	Recommended(M6)	3.0		6.0	N·m
Module-to-Sink Torque	M_s	Recommended(M5)	3.0		6.0	N·m
Weight of Module	G			350		g

● Circuit Diagram



● Package Dimensions

Dimensions in Millimeters

