BS600HF120B2SDX

IGBT Module

1200V , 600A Half Bridge Module

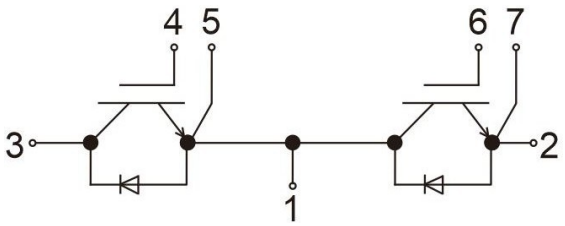
bestirpower

概述

Bestirpower的 IGBT 提供超快的开关速度适用于焊接、感应加热、UPS 和其他高频应用。

General Description

Bestirpower's IGBTs offer ultrafast switching speed for application such as welding, inductive heating, UPS and other high frequency applications.



特点

- VCE(sat)正温度系数
- 1200V600A,VCE(sat)(typ.)=1.65V
- 低开关损耗
- 大电流能力
- 出色的短路耐受

Features

- VCE(sat) with positive temperature coefficient
- 1200V600A,VCE(sat)(typ.)=1.65V
- Low switching losses
- High current capability
- Excellent short circuit ruggednesss

最大额定绝对值/ Absolute Maximum Ratings T_C=25°C unless otherwise noted

Symbol	Parameter		Value	Unit	Note
V_{CES}	集电极-发射极电压	Collector-Emitter voltage	1200	V	
V_{GES}	栅极-发射极电压	Continuous Gate to Emitter Voltagee	±20	V	
I_c	连续集电极直流电流	Continuous Collector Current (T_C=25℃)	800	A	Fig.1,2
	连续集电极直流电流	Continuous Collector Current (T_C=90℃)	600		
P_D	最大功耗（T_C=25℃）	Maximum Power Dissipation (T_C=25℃)	2142	W	
	最大功耗（T_J=175℃）	Maximum Power Dissipation (T_J=175℃)			
t_{sc}	短路耐受时间	Short Circuit Withstand Time	10	μs	
T_J	IGBT最大结温	Maximum IGBT Junction Temperature	175	℃	
T_{JOP}	最大工作结温范围	Maximum Operating Junction Temperature Range	-40 to +150	℃	
T_{stg}	保存温度	Storage Temperature Range	-40 to +125	℃	
V_{RRM}	二极管重复峰值反向电压初步数据 Repetitive Peak Reverse Voltage Preliminary Data		1200	V	
I_F	二极管连续正向电流	Diode Continuous Forward Current (T_C=25℃)	600	A	Fig.8
I_{FM}	二极管最大正向电流	Diode Maximun Forward Current	1200	A	

IGBT电气特性/ Electrical Characteristics of IGBT T_C=25℃ unless otherwise noted

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Units	Note
BV_{CES}	集电极-发射极击穿电压 Collector-Emitter Breakdown Voltage	V_{GE}= 0V,I_C = 1mA		1200	-	-	V	
I_{CES}	集电极-发射极漏电流 Collector-Emitter Leakage Current	V_{CE}= 1200V ,V_{GE} = 0V		-	-	1	mA	
I_{GES}	栅极-发射极正向漏电流 Gate to Emitter Leakage Current	V_{GE}= 20V, V_{CE}=0V		-	-	±400	nA	
$V_{GE(th)}$	阈值电压 Gate Threshold Voltage	V_{GE}=V_{CE}, I_C=8mA		4.8	5.7	6.6	V	Fig.1
$V_{CE(sat)}$	集电极-发射极饱和电压 Collector-Emitter Saturation Voltage	V_{GE}=15V, I_C=600A, T_J= 25°C		-	1.65	2.00	V	
		V_{GE}=15V, I_C=600A, T_J= 150°C		-	2.00	-		
$t_{d(on)}$	开通延迟时间 Turn-on Delay time	V_{CC} = 600V, I_C = 600A V_{GE} = +15/-15V R_{Gon} = 1 Ω RG_{off} = 1 Ω	T_J= 25°C	-	0.12	-	us	
			T_J= 150°C	-	0.13	-		
t_r	开通上升时间 Turn-on Rise Time		T_J= 25°C	-	0.06	-	us	
			T_J= 150°C	-	0.07	-		
$t_{d(off)}$	关断延迟时间 Turn-off Delay time		T_J= 25°C	-	0.41	-	us	
			T_J= 150°C	-	0.46	-		
t_f	关断下降时间 Turn-off Fall Time		T_J= 25°C	-	0.24	-	us	
			T_J= 150°C	-	0.39	-		
E_{on}	开通损耗 Turn-on Switching Loss		T_J= 25°C	-	17.0	-	mJ	Fig.4,5
			T_J= 150°C	-	31.5	-		
E_{off}	关断损耗 Turn-off Switching Loss		T_J= 25°C	-	58.5	-	mJ	
			T_J= 125°C	-	74.0	-		
Q_g	栅极电荷 Total Gate Charge	V_{CC} = 600V, I_C = 600A V_{GE} = +15/-15V	T_J= 25°C	-	3750	-	nC	
C_{ies}	输入电容 Input Capacitance	V_{CE}=25V V_{GE}=0V f=100kHz T_J= 25°C		-	62.5	-	nF	
C_{res}	反向传输电容 Reverse Transfer Capacitance			-	0.45	-		
R_{Gint}	栅极电阻 Integrated gate resistor	f=1MHz		-	1.0	-	Ω	
R_{thJC}	IGBT的芯片与外壳间的热阻 Thermal Resistance, Junction-to-Case (IGBT)	Per IGBT		-	-	0.07	℃/W	
R_{thCH}	Thermal resistance, case to heatsink	Per IGBT, λ_{grease} = 1 W/(m·K)		-	0.05	-	℃/W	
I_{sc}	Short circuit data	VGE=15V,VCC=800V VCEmax=VCES-LsCE·di/dt tp≤10us		-	2000	-	A	

二极管电气特性/ Electrical Characteristics of Diode T_C=25ºC unless otherwise noted

Symbol	Parameter	Test Conditions		Min.	Typ.	Max.	Units	Note
V_F	二极管导通电压 Diode Forward Voltage	I_F = 600A	T_J= 25°C	-	1.60	1.95	V	Fig.8
			T_J= 150°C	-	1.55	-		
I_{rr}	二极管反向恢复峰值电流 Diode peak Reverse Recovery Current	I_F=600A V_R= 600V V_{GE}=-15V R_{Gon}=1Ω	T_J= 25°C	-	711	-	A	
			T_J= 150°C		785			
Q_{rr}	二极管反向恢复电荷 Diode Reverse Recovery Charge		T_J= 25°C	-	95.0	-	uC	
			T_J= 150°C	-	150	-		
E_{rr}	二极管反向恢复能量 Diode Reverse Recovery Energy		T_J= 25°C	-	56.0	-	mJ	
			T_J= 150°C	-	80.0	-		
R_{thJC}	二极管的芯片与外壳间的热阻 Thermal Resistance, Junction-to-Case (Diode)	Per Diode		-	-	0.087	℃/W	
R_{thCH}	Thermal resistance, case to heatsink	Per Diode, λ_{grease} = 1 W/(m·K)		-	0.06	-	℃/W	

模块特性/ Module Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units
V_{ISO}	隔离电压 Isolation Voltage (All Terminals Shorted),f = 50Hz, 1minute	4000	-	-	V
$R_{\theta CS}$	外壳与散热器凹槽间热阻（涂有导电油脂情况下） Case-To-Sink(Conductive Grease Applied)	-	0.1	-	℃/W
M	电源端子螺钉：M6 Power Terminals Screw: M6	2.5	-	5.0	N·m
M	安 装 螺 钉 ：M6 Mounting Screw: M6	3.0	-	6.0	N·m
G	重量　Weight	-	310	-	g

图1.IGBT输出特性
Fig 1, Output Characteristics IGBT, Inverter (typical) IC = f(VCE) TJ = 25°C

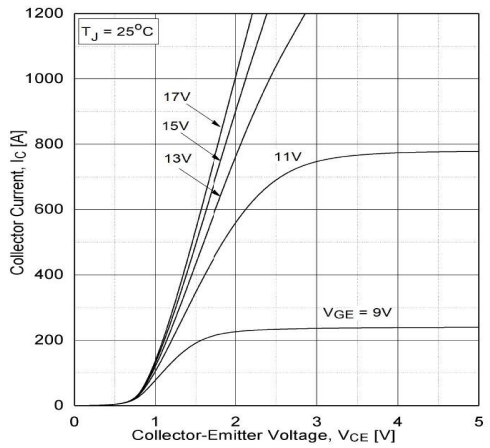


图2.IGBT输出特性
Fig 2, Output Characteristics IGBT, Inverter(typical) IC = f(VCE) TJ = 150°C

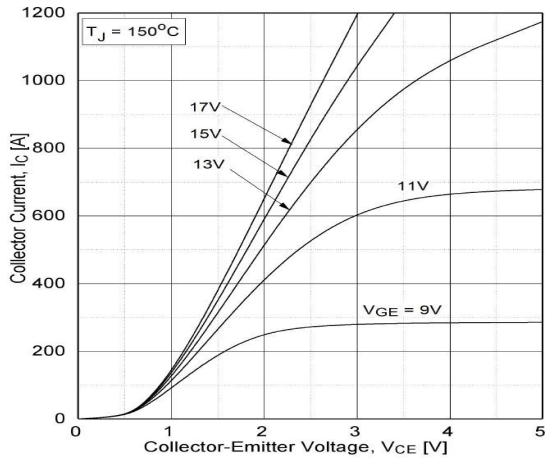


图3. IGBT传输特性
Fig 3, Transfer Characteristics IGBT, Inverter (typical) IC = f(VGE) VCE = 20 V

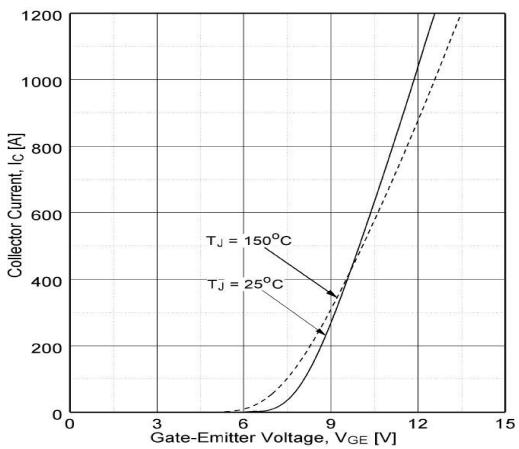


图4. IGBT开关损耗逆变器
Fig 4, Switching Losses IGBT, Inverter (typical) , VCE = 600V Eon = f(IC), Eoff = f(IC)VGE = +15/-15 V, RGon = 1 Ω ,RGoff = 1 Ω

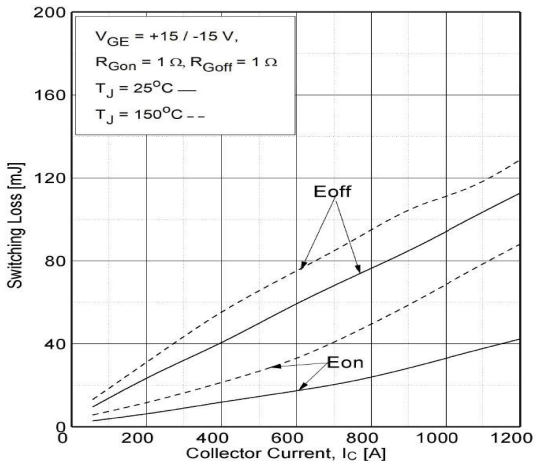


图5. IGBT开关损耗逆变器
Fig 5, Switching Losses IGBT, Inverter (typical) Eon = f(RG), Eoff = f(RG)VGE = +15/-15 V, ICE = 600 A, VCE = 600 V

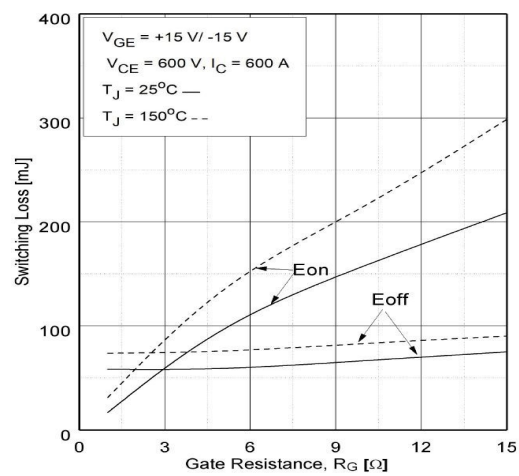


图6. IGBT瞬态热阻特性
Fig 6, Transient Thermal Impedance IGBT, Inverter ZthJC = f(t)

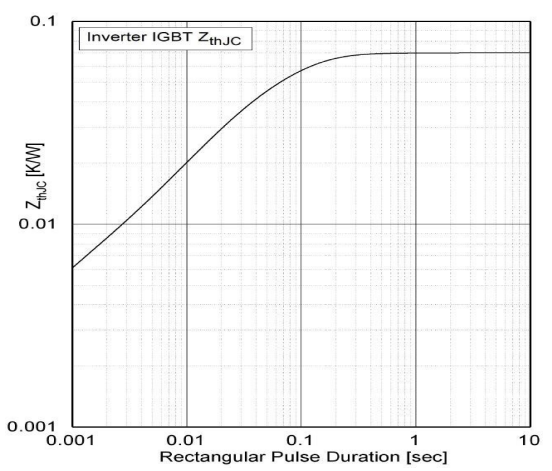


图7. IGBT反向偏置安全工作区
Fig 7, Reverse Bias safe operating area IGBT, Inverter (RBSOA)
IC = f(VCE) VGE = +15/-15 V, RGoff = 1Ω , TJ = 150°C

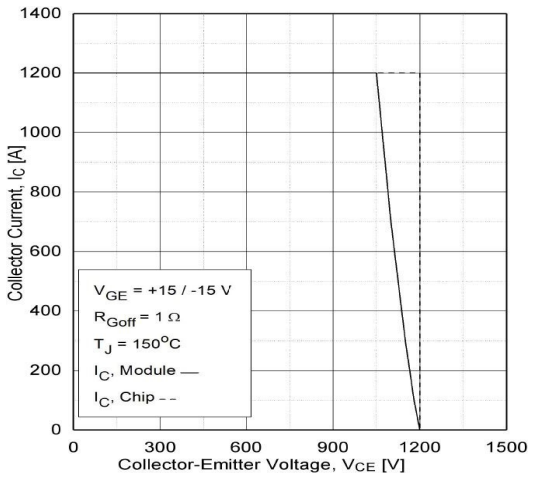


图8. 二极管正向特性
Fig 8, Forward Characteristics of Diode, Inverter (typical)
IF= f(VF)

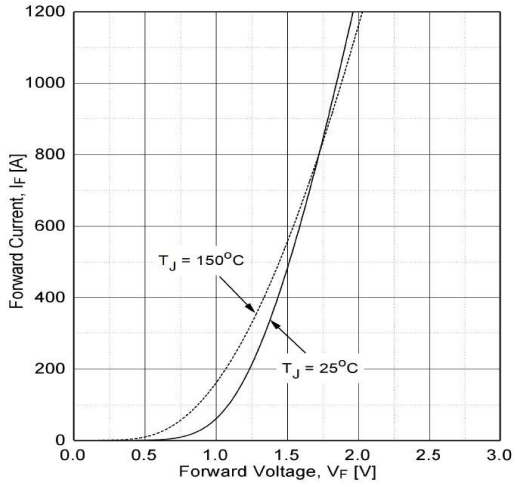


图9. 开关损耗二极管
Fig 9, Switching Losses Diode, Inverter (typical)
Erec = f(IF)

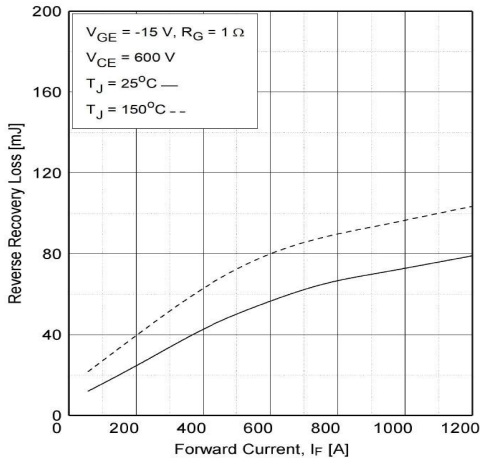


图10. 开关损耗二极管
Fig 10, Switching Losses Diode, Inverter (typical) Erec = f(RG)

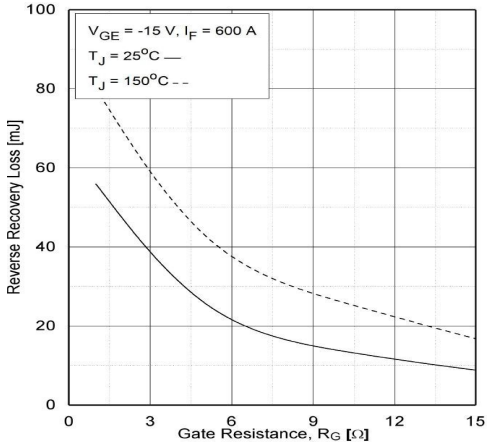
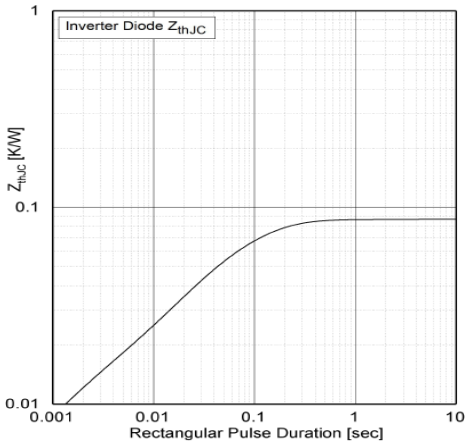
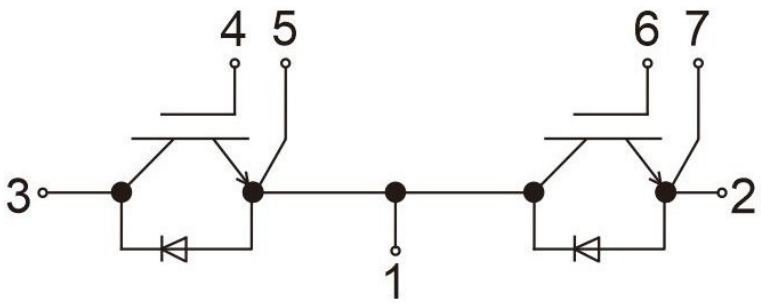


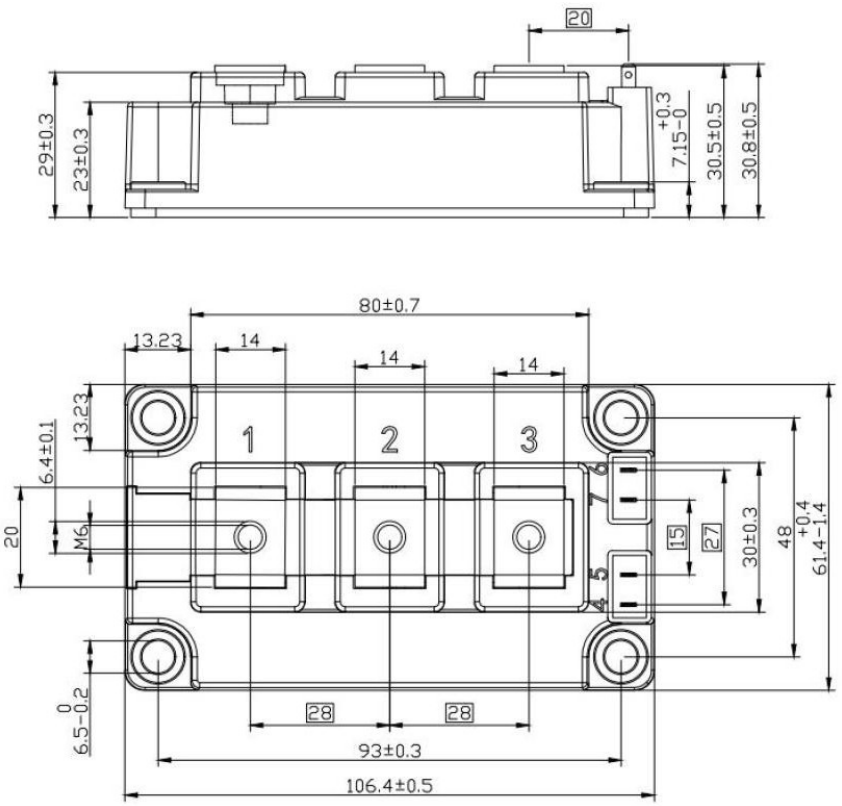
图11. 二极管瞬态热阻抗
Fig 11, Transient Thermal Impedance Diode, Inverter ZthJC = f(t)



接线图 / Circuit diagram headline



封装尺寸 / Package outlines



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