

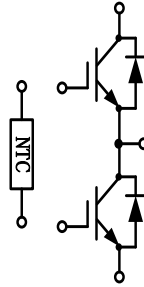
Half Bridge IGBT Module

电气特性:

- 1200V 沟槽栅/场终止工艺
- 低开关损耗
- 正温度系数

典型应用:

- 变频器
- UPS
- 伺服
- 逆变器



$V_{CES} = 1200V$, $I_{C\ nom} = 600A$ / $I_{CRM} = 1200A$

IGBT, 逆变器 / IGBT, Inverter

最大额定值 / Maximum Ratings

Parameter	Conditions	Symbol	Value	Unit
集电极-发射极电压 Collector-Emitter voltage	$T_{vj} = 25^{\circ}C$	V_{CES}	1200	V
连续集电极直流电流 Continuous DC collector current	$T_C = 100^{\circ}C$, $T_{vj\ max} = 175^{\circ}C$	$I_{C\ nom}$	600	A
集电极重复峰值电流 Repetitive peak collector current	$t_p = 1\ ms$	I_{CRM}	1200	A
栅极-发射极电压 Gate emitter voltage		V_{GE}	± 20	V

特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
集电极-发射极饱和电压 Collector-Emitter saturation voltage	$V_{GE} = 15V$, $I_C = 600A$ $V_{GE} = 15V$, $I_C = 600A$ $V_{GE} = 15V$, $I_C = 600A$	$T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 150^{\circ}C$	$V_{CE\ sat}$	1.78 2.07 2.13	2.10	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 23mA$, $V_{GE} = V_{CE}$,	$T_{vj} = 25^{\circ}C$	V_{GEth}	5.2	5.8	6.4
栅电荷 Gate charge	$V_{GE} = -15V \dots +15V$		Q_G	5.55		μC
内部栅极电阻 Internal gate resistor			R_{Gint}	1.34		Ω
输入电容 Input capacitance	$f = 1MHz$, $V_{CE} = 25V$, $V_{GE} = 0V$	$T_{vj} = 25^{\circ}C$	C_{ies}	47.07		nF

Input capacitance						
反向传输电容 Reverse transfer capacitance		C_{res}		2.20		
集电极-发射极截止电流 Collector-emitter cut-off current	$V_{CE}=1200V, V_{GE}=0V$	$T_{vj}=25^{\circ}C$	I_{CES}		2	mA
栅极-发射极漏电流 Gate-emitter leakage current	$V_{CE}=0V, V_{GE}=20V$	$T_{vj}=25^{\circ}C$	I_{GES}		200	nA
开通延迟时间 Turn-on delay time	$I_C=600A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=1.5\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	t_{don}		201 238 248	
上升时间 Rise time	$I_C=600A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=1.5\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	t_r		194 200 202	
关断延迟时间 Turn-off delay time	$I_C=600A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=1.5\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	t_{doff}		582 647 697	ns
下降时间 Fall time	$I_C=600A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=1.5\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	t_f		105 138 173	
开通损耗能量 (每脉冲) Turn-on energy loss per pulse	$I_C=600A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=1.5\Omega$ $di/dt=2379A/\mu s (T_{vj}=150^{\circ}C)$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	E_{on}		93.35 119.5 130.1 0	mJ
关断损耗能量 (每脉冲) Turn-off energy loss per pulse	$I_C=600A, V_{CE}=600V$ $V_{GE}=\pm 15V, R_G=1.5\Omega$ $dv/dt=3121V/\mu s (T_{vj}=150^{\circ}C)$ (电感负载) / (inductive load)	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	E_{off}		61.57 71.01 76.53	mJ
短路数据 SC data	$V_{GE}\leq 15V, V_{CC}=800V$ $V_{CEmax}=V_{CES}-L_{sCE}\cdot di/dt \quad t_p\leq 10\mu s, T_{vj}=150^{\circ}C$		I_{sc}		3000	A
在开关状态下温度 Temperature under switching conditions			$T_{vj op}$	-40	150	$^{\circ}C$

二极管，逆变器 / Diode, Inverter

最大额定值 / Maximum Ratings

Parameter	Conditions	Symbol	Value	Unit
反向重复峰值电压 Repetitive peak reverse voltage	$T_{vj}=25^{\circ}C$	V_{RRM}	1200	V
连续正向直流电流 Continuous DC forward current		I_F	600	A
正向重复峰值电流 Repetitive peak forward current	$t_p=1ms$	I_{FRM}	1200	A

特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F=600A, V_{GE}=0V$ $I_F=600A, V_{GE}=0V$ $I_F=600A, V_{GE}=0V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	V_F	2.44 2.55 2.50	2.70	V
反向恢复峰值电流 Peak reverse recovery current	$I_F=600A, -di_F/dt=2417A/\mu s$ $V_R=600V$ $V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	I_{RM}	144 208 240		A
恢复电荷 Recovered charge	$I_F=600A, -di_F/dt=2417A/\mu s$ $V_R=600V$ $V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	Q_F	19.70 51.44 63.30		μC
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=600A, -di_F/dt=2417A/\mu s$ $V_R=600V$ $V_{GE}=-15V$	$T_{vj}=25^\circ C$ $T_{vj}=125^\circ C$ $T_{vj}=150^\circ C$	E_{rec}	4.79 14.37 17.93		mJ
在开关状态下温度 Temperature under switching conditions			$T_{vj op}$	-40	150	$^\circ C$

负温度系数热敏电阻 / NTC-Thermistor

特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
额定电阻值 Rated resistances	$T_c=25^\circ C, \pm 5\%$	R_{25}		5.0		$K \Omega$
B-值 B-value	$\pm 2\%$	$B_{25/50}$		3375		K

模块 / Module

Parameter	Conditions	Symbol	Value			Unit
绝缘测试电压 Isolation test voltage	RMS, $f=50Hz, t=1min$	V_{ISOL}	2500			V
内部绝缘 Internal isolation			Al_2O_3			
储存温度 Storage temperature		T_{stg}	-40		125	$^\circ C$
模块安装的扭矩 Mounting torque for modul mounting		M	3.0		6.0	Nm
重量 Weight		W		343		g

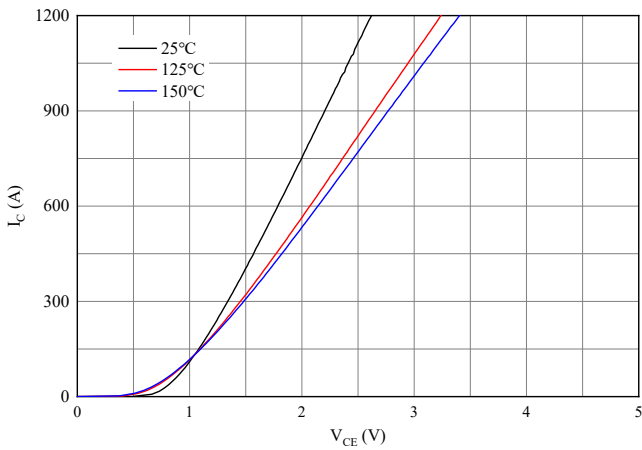


图 1. 典型输出特性 ($V_{GE}=15V$)

Figure 1. Typical output characteristics ($V_{GE}=15V$)

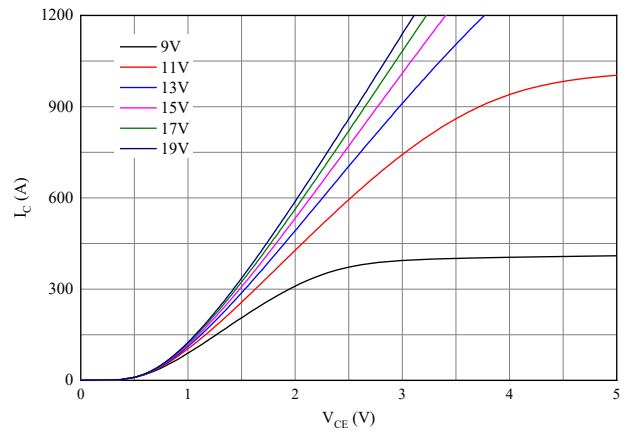


图 2. 典型输出特性 ($T_{vj}=150^{\circ}C$)

Figure 2. Typical output characteristics ($T_{vj}=150^{\circ}C$)

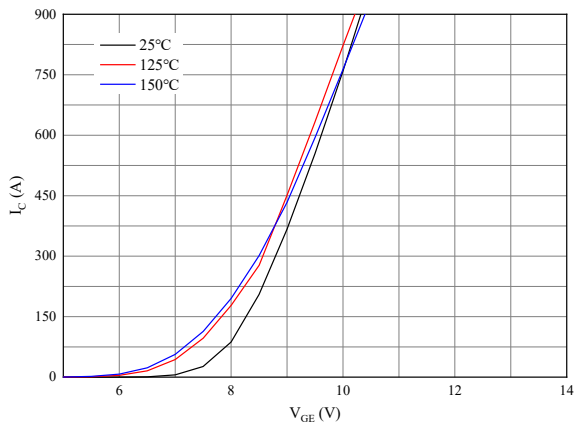


图 3. 典型传输特性 ($V_{CE}=20V$)

Figure 3. Typical transfer characteristic ($V_{CE}=20V$)

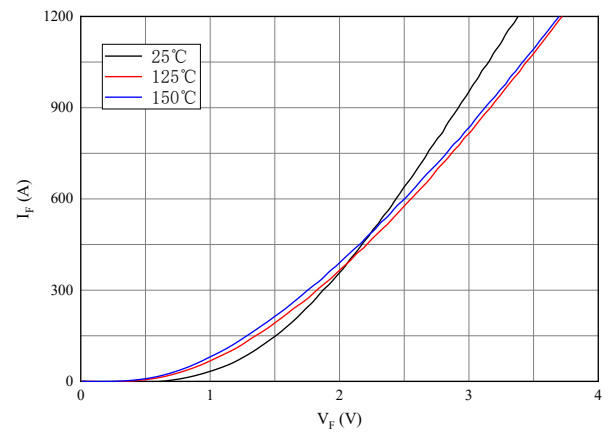


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

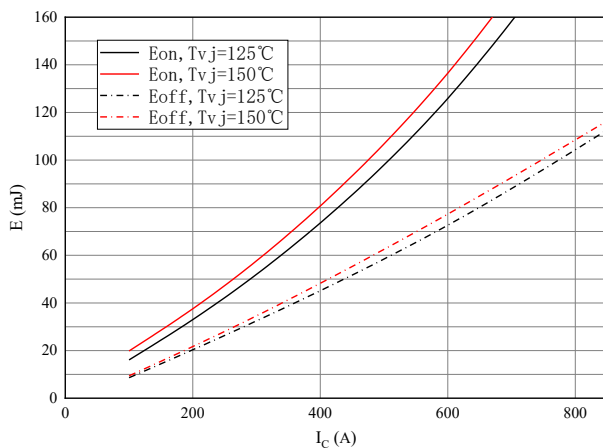


图 5. 开关损耗 逆变器

Figure 5. Switching losses of IGBT
 $V_{GE}=\pm 15V$, $R_{Gon}=1.5\Omega$, $R_{Goff}=1.5\Omega$, $V_{CE}=600V$

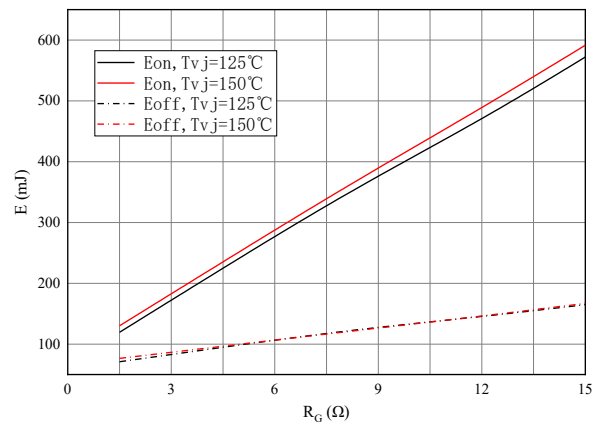


图 6. 开关损耗 逆变器

Figure 6. Switching losses of IGBT
 $V_{GE}=\pm 15V$, $I_C=600A$, $V_{CE}=600V$

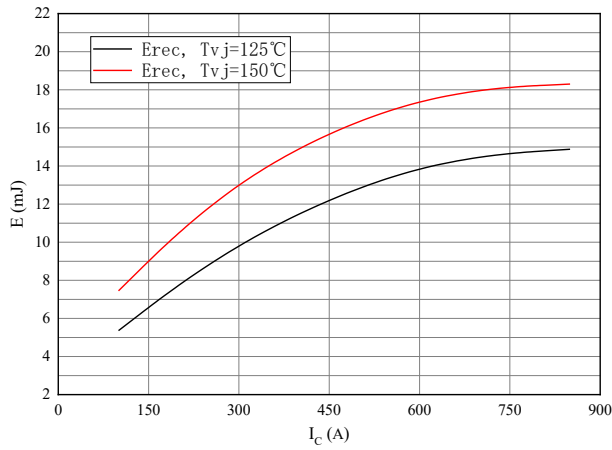


图 7. 开关损耗 二极管

Figure 7. Switching losses of Diode
R_{Gon}=1.5Ω, V_{CE}=600V

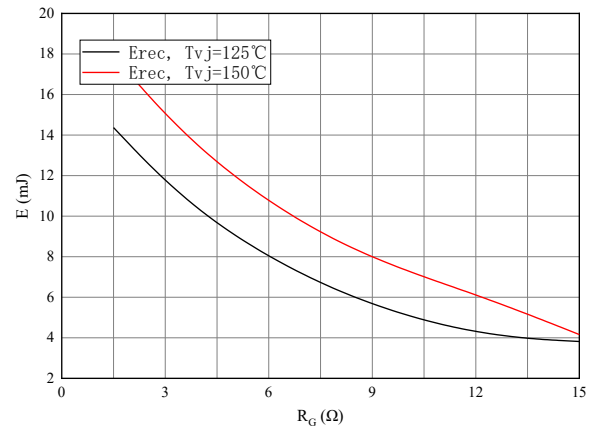


图 8. 开关损耗 二极管

Figure 8. Switching losses of Diode
IF=600A, V_{CE}=600V

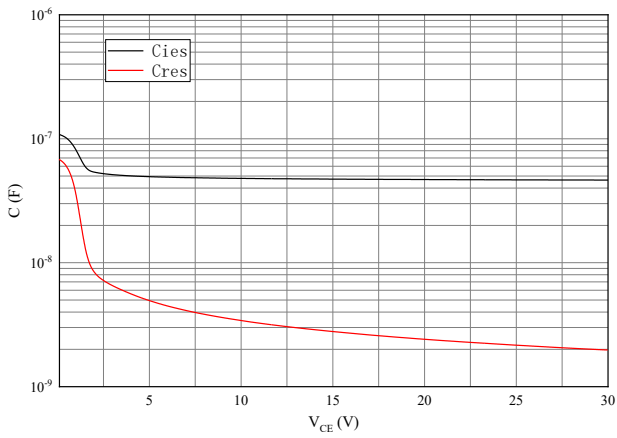


图 9. 电容特性

Figure 9. Capacitance characteristic

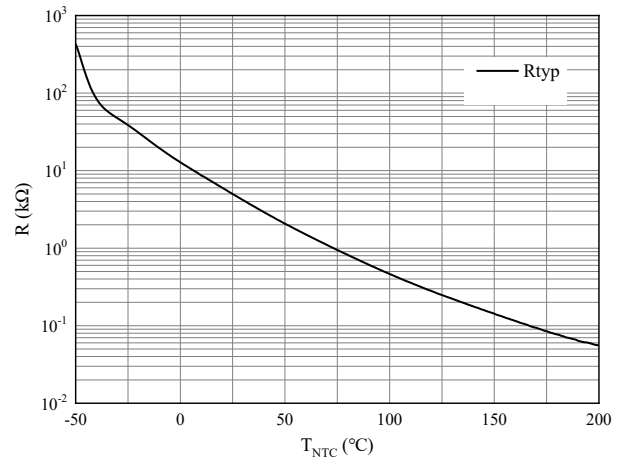
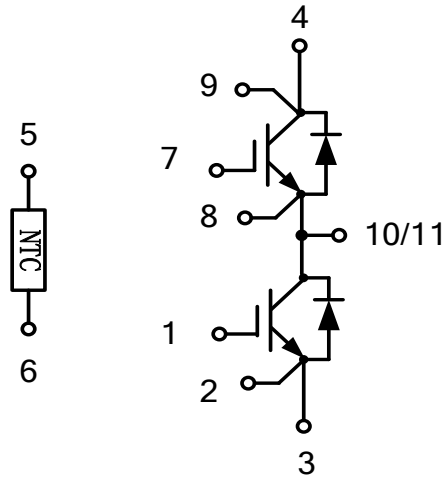


图 10. 负温系数热敏电阻 温度特性

Figure10. NTC-Thermistor-temperature characteristic

接线图 / Circuit diagram



封装尺寸 / Package outlines

