

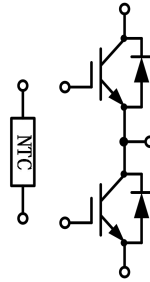
Half Bridge IGBT Module

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



$V_{CES} = 1200V$, $I_{C\ nom} = 450A$ / $I_{CRM} = 900A$

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	$T_C = 100^{\circ}C$, $T_{vj\ max} = 175^{\circ}C$	$I_{C\ nom}$	450	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}C$, $T_{vj\ max} = 175^{\circ}C$	P_{tot}	2250	W
集电极重复峰值电流 Repetitive peak collector current	$t_p = 1\ ms$	I_{CRM}	900	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	$V_{GE} = 15V$, $I_C = 450A$ $V_{GE} = 15V$, $I_C = 450A$ $V_{GE} = 15V$, $I_C = 450A$	$T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 150^{\circ}C$	$V_{CE\ sat}$	1.60 1.80 1.90	2.07	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 17mA$, $V_{GE} = V_{CE}$,	$T_{vj} = 25^{\circ}C$	V_{GEth}	5.40	6.0	6.60
栅电荷 Gate charge	$V_{GE} = -15V \dots +15V$		Q_G	2.09		μC
内部栅极电阻 Internal gate resistor			R_{Gint}	0.36		Ω

输入电容 Input capacitance	f=100KHZ, V _{CE} =25V, V _{GE} =0 V T _{vj} =25°C	C _{ies}	71.80	nF
反向传输电容 Reverse transfer capacitance		C _{res}	0.62	
集电极-发射极截止电流 Collector-emitter cut-off current	V _{CE} =1200V, V _{GE} =0 V T _{vj} =25°C	I _{CES}	2	mA
栅极-发射极漏电流 Gate-emitter leakage current	V _{CE} =0 V, V _{GE} =20 V T _{vj} =25°C	I _{GES}	200	nA
开通延迟时间 Turn-on delay time	I _C =450 A, V _{CE} =600 V T _{vj} =25°C V _{GE} =±15 V, R _G =1.5Ω T _{vj} =125°C (电感负载) / (inductive load) T _{vj} =150°C	t _{d on}	281 284 282	ns
上升时间 Rise time	I _C =450 A, V _{CE} =600 V T _{vj} =25°C V _{GE} =±15 V, R _G =1.5Ω T _{vj} =125°C (电感负载) / (inductive load) T _{vj} =150°C	t _r	69 71 74	
关断延迟时间 Turn-off delay time	I _C =450 A, V _{CE} =600 V T _{vj} =25°C V _{GE} =±15 V, R _G =1.5Ω T _{vj} =125°C (电感负载) / (inductive load) T _{vj} =150°C	t _{d off}	375 422 430	
下降时间 Fall time	I _C =450 A, V _{CE} =600 V T _{vj} =25°C V _{GE} =±15 V, R _G =1.5Ω T _{vj} =125°C (电感负载) / (inductive load) T _{vj} =150°C	t _f	133 217 240	
开通损耗能量 (每脉冲) Turn-on energy loss per pulse	I _C =450 A, V _{CE} =600 V T _{vj} =25°C V _{GE} =±15 V, R _G =1.5Ω T _{vj} =125°C di/dt=4900A/us(T _{vj} =150°C) (电感负载) / (inductive load) T _{vj} =150°C	E _{on}	20.00 46.77 56.15	mJ
关断损耗能量 (每脉冲) Turn-off energy loss per pulse	I _C =450 A, V _{CE} =600 V T _{vj} =25°C V _{GE} =±15 V, R _G =1.5Ω T _{vj} =125°C du/dt=4200V/us(T _{vj} =150°C) (电感负载) / (inductive load) T _{vj} =150°C	E _{off}	36.20 46.48 48.20	mJ
短路数据 SC data	V _{GE} ≤15V, V _{CC} =800V V _{CEmax} =V _{CES} -L _{sCE} ·di/dt t _p ≤10us, T _{vj} =150°C	I _{SC}	1700	A
在开关状态下温度 Temperature under switching conditions		T _{vj op}	-40	150 °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°C	V _{RRM}	1200	V
连续正向直流电流 Continuous DC forward current		I _F	450	A
正向重复峰值电流 Repetitive peak forward current	t _p =1ms	I _{FRM}	900	A
I ² t 值 I ² t-value	t _p =10ms, sin180°, T _j =125°C	I ² t	38000	A ² s

特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F=450A, V_{GE}=0V$ $I_F=450A, V_{GE}=0V$ $I_F=450A, V_{GE}=0V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	V_F	1.99 1.75 1.70	2.40	V
反向恢复峰值电流 Peak reverse recovery current	$I_F=450A, V_R=600V, V_{GE}=-15V$ $-diF/dt=5200 A/us(T_{vj}=150^{\circ}C)$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	I_{RM}	336 461 499		A
恢复电荷 Recovered charge	$I_F=450A, V_R=600V, V_{GE}=-15V$ $-diF/dt=5200 A/us(T_{vj}=150^{\circ}C)$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	Q_r	36.95 85.31 104.57		μC
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=450A, V_R=600V, V_{GE}=-15V$ $-diF/dt=5200 A/us(T_{vj}=150^{\circ}C)$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	E_{rec}	15.77 31.55 38.33		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 Ω
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 ₂ O 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
端子联接扭距 Terminal connection torque		M	3.0		6.0	Nm
重量 Weight		W		342		g

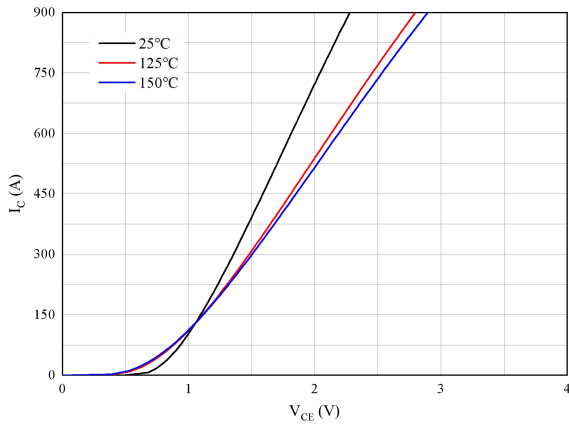


图 1. 典型输出特性 ($V_{GE}=15V$)
Figure 1. Typical output characteristics ($V_{GE}=15V$)

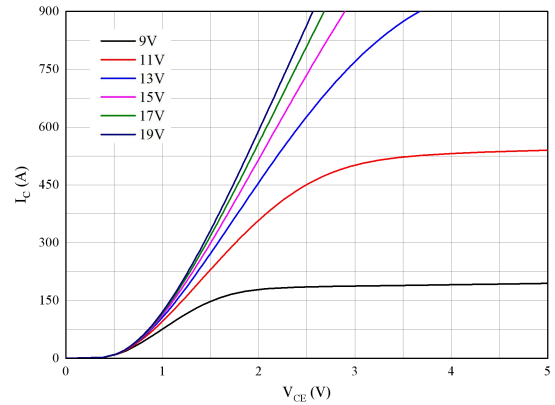


图 2. 典型输出特性 ($T_{vj}=150^{\circ}C$)
Figure 2. Typical output characteristics ($T_{vj}=150^{\circ}C$)

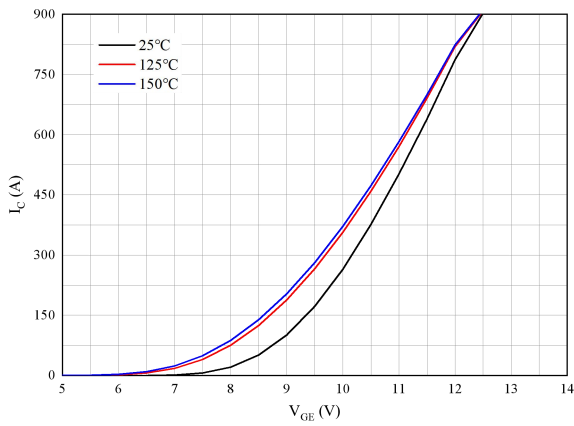


图 3. 典型传输特性 ($V_{CE}=20V$)
Figure 3. Typical transfer characteristic ($V_{CE}=20V$)

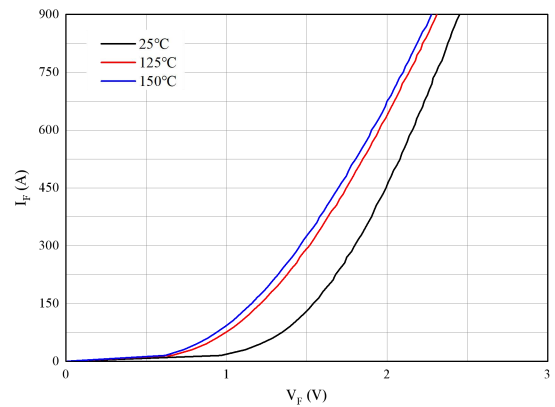


图 4. 正向偏压特性 二极管
Figure 4. Forward characteristic of Diode

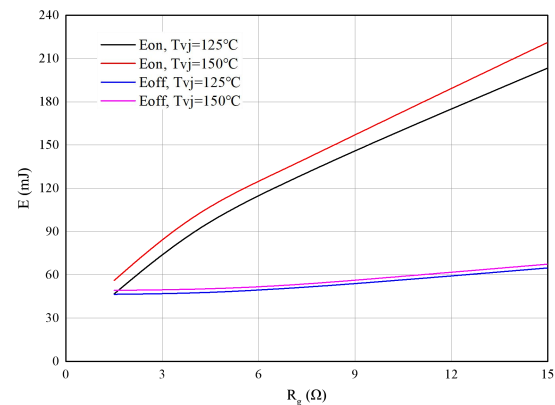
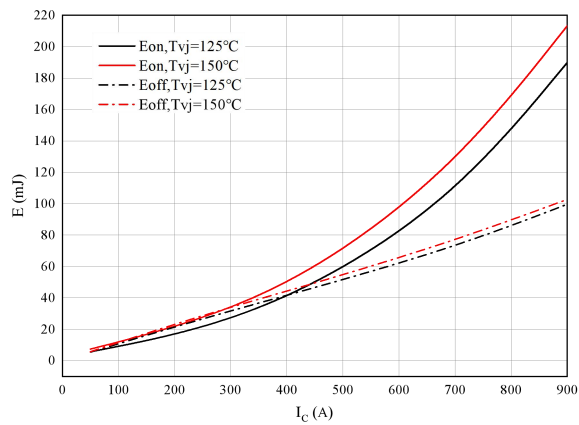


图 5. 开关损耗 逆变器

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

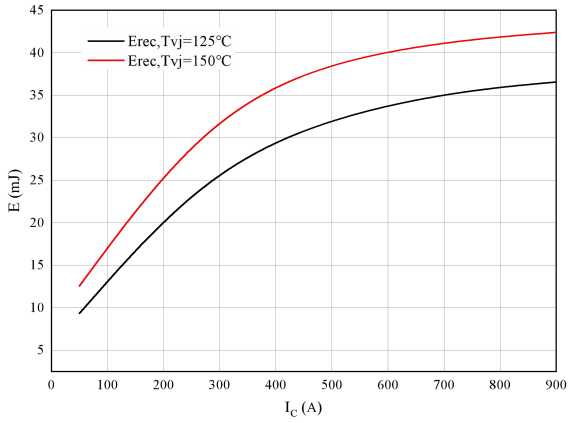


图 7. 开关损耗 二极管

Figure 7. Switching losses of Diode
 $R_{gon}=1.5\Omega$, $V_{CE}=600V$

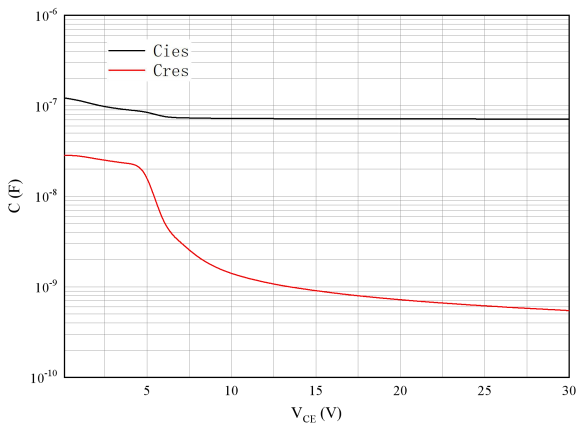


图 9. 电容特性
 Figure 9. Capacitance characteristic

图 6. 开关损耗 逆变器

Figure 6. Switching losses of IGBT
 $V_{GE}=\pm 15V$, $I_C=450A$, $V_{CE}=600V$

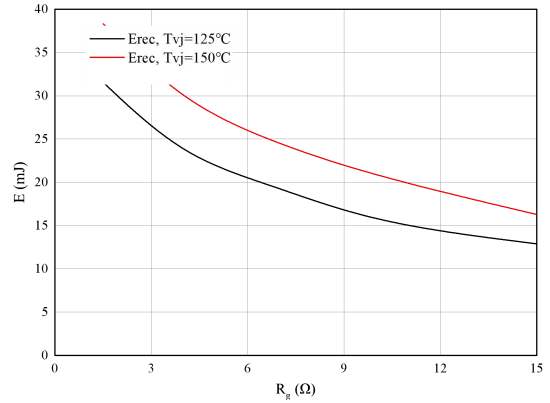


图 8. 开关损耗 二极管

Figure 8. Switching losses of Diode
 $I_F=450A$, $V_{CE}=600V$

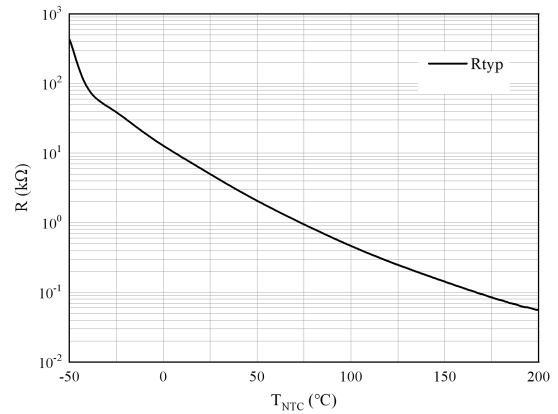
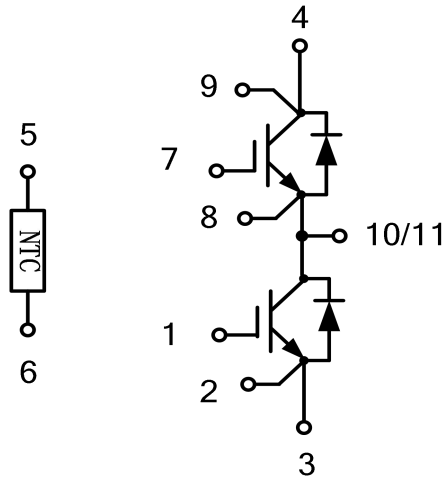


图 10. 负温系数热敏电阻 温度特性
 Figure10. NTC-Thermistor-temperaturecharacteristic

接线图 / Circuit diagram



封装尺寸 / Package outlines

