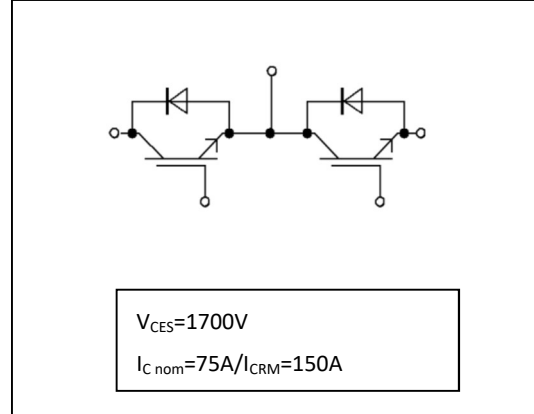
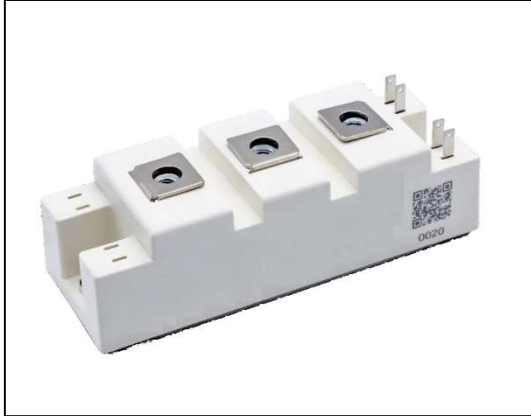


1700V 75A IGBT Half Bridge Module

1700V 75A IGBT 半桥模块



Features:

- 1700V Trench Gate & Field Stop Structure
- High Short Circuit Capability
- Low Switching Loss
- High Reliability
- Positive Temperature Coefficient

Typical Applications:

- Motor Drives
- Servo Drives
- Inverter and Power Supplies
- Photovoltaic

产品特性:

- 1700V沟槽栅及场截止结构
- 高短路耐量
- 低开关损耗
- 高可靠性
- 正温度系数

典型应用:

- 电机传动
- 伺服驱动器
- 逆变器和电源
- 光伏发电

IGBT, Inverter / IGBT, 逆变器

Maximum Rated Values / 最大额定值

Item	Symbol	Conditions	Value	Units
集电极-发射极电压 Collector-emitter voltage	V_{CEs}	$T_{vj}=25^{\circ}C$	1700	V
连续集电极直流电流 Continuous DC collector current	$I_{C\ nom}$		75	A
集电极重复峰值电流 Peak repetitive collector current	I_{CRM}	$t_p=1ms$	150	A
总功率损耗 Total power dissipation	P_{tot}	$T_c=25^{\circ}C, T_{vjmax}=175^{\circ}C$	535	W
栅极-发射极峰值电压 Maximum gate-emitter voltage	V_{GES}		± 20	V
最高结温 Maximum junction temperature	T_{vjmax}		175	$^{\circ}C$

Characteristic Values / 特征值

Item	Symbol	Conditions	Min.	Typ.	Max.	Units
集电极-发射极饱和电压 Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_c=75A, V_{GE}=15V$		$T_{vj}=25^{\circ}C$ 2.24 $T_{vj}=125^{\circ}C$ 2.51 $T_{vj}=150^{\circ}C$ 2.56	2.60	V V V
栅极阈值电压 Gate threshold voltage	$V_{GE(th)}$	$I_c=3mA, V_{CE}=V_{GE}, T_{vj}=25^{\circ}C$	4.5	5.9	6.5	V
栅极电荷 Gate charge	Q_G	$V_{GE}=-15V...+15V$		0.47		μC
内部栅极电阻 Internal gate resistor	R_{Gint}	$T_{vj}=25^{\circ}C$		10.8		Ω
输入电容 Input capacitance	C_{ies}	$f=1MHz, T_{vj}=25^{\circ}C, V_{CE}=25V, V_{GE}=0V$		5.03		nF
反向传输电容 Reverse transfer capacitance	C_{res}	$f=1MHz, T_{vj}=25^{\circ}C, V_{CE}=10V, V_{GE}=0V$		0.18		nF
集电极-发射极截止电流 Collector-emitter cut-off current	I_{CES}	$V_{CE}=1700V, V_{GE}=0V, T_{vj}=25^{\circ}C$			3.00	mA
栅极-发射极漏电流 Gate-emitter leakage current	I_{GES}	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^{\circ}C$			400	nA
开通延迟时间(电感负载) Turn-on delay time, inductive load	$t_{d(on)}$			$T_{vj}=25^{\circ}C$ 174 $T_{vj}=125^{\circ}C$ 184 $T_{vj}=150^{\circ}C$ 188		ns ns ns
上升时间(电感负载) Rise time, inductive load	t_r			$T_{vj}=25^{\circ}C$ 80 $T_{vj}=125^{\circ}C$ 83 $T_{vj}=150^{\circ}C$ 81		ns ns ns
关断延迟时间(电感负载) Turn-off delay time, inductive load	$t_{d(off)}$	$I_c=75A, V_{CE}=900V$ $V_{GE}=\pm 15V$ $R_{Gon}=6.6\Omega$		$T_{vj}=25^{\circ}C$ 319 $T_{vj}=125^{\circ}C$ 380 $T_{vj}=150^{\circ}C$ 401		ns ns ns
下降时间(电感负载) Fall time, inductive load	t_f	$R_{Goff}=6.6\Omega$ Inductive Load,		$T_{vj}=25^{\circ}C$ 310 $T_{vj}=125^{\circ}C$ 562 $T_{vj}=150^{\circ}C$ 596		ns ns ns
开通损耗能量(每脉冲) Turn-on energy loss per pulse	E_{on}			$T_{vj}=25^{\circ}C$ 24.7 $T_{vj}=125^{\circ}C$ 27.6 $T_{vj}=150^{\circ}C$ 28.4		mJ mJ
关断损耗能量(每脉冲) Turn-off energy loss per pulse	E_{off}			$T_{vj}=25^{\circ}C$ 10.9 $T_{vj}=125^{\circ}C$ 16.1 $T_{vj}=150^{\circ}C$ 17.5		mJ mJ
短路数据 SC data	I_{sc}	$V_{GE}\leq 15V, V_{CC}=1000V$ $V_{CEmax}=V_{CES}-L_{SCE}\cdot di/dt, t_p=10\mu s, T_{vj}=150^{\circ}C$		240		A

结-外壳热阻 Thermal resistance, junction to case	R_{thJC}	Per IGBT / 每个 IGBT	0.28	K/W
工作温度 Temperature under switching conditions	T_{vjop}		-40	150 °C

Diode, Inverter / 二极管, 逆变器

Maximum Rated Values / 最大额定值

Item	Symbol	Conditions	Value	Units
反向重复峰值电压 Peak repetitive reverse voltage	V_{RRM}	$T_{vj}=25^{\circ}C$	1700	V
连续正向直流电流 Continuous DC forward current	I_F		75	A
正向重复峰值电流 Peak repetitive forward current	I_{FRM}	$t_p=1ms$	150	A

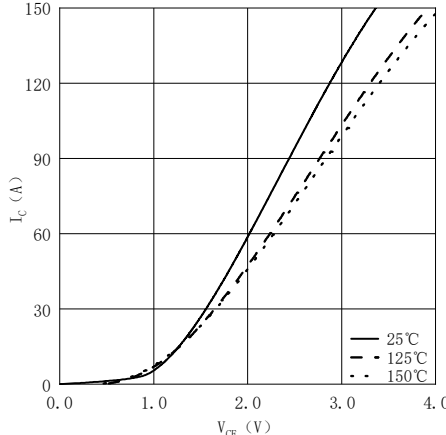
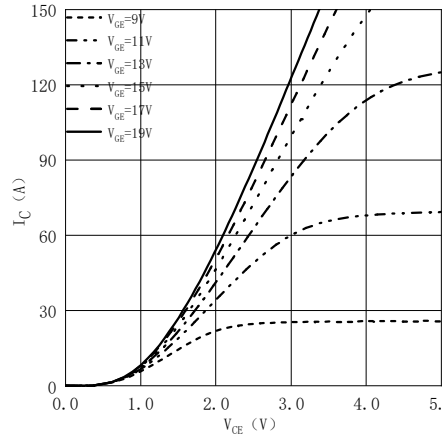
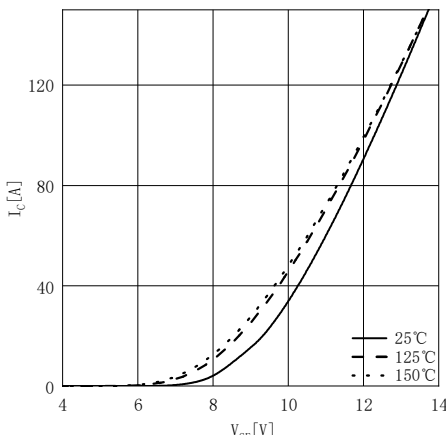
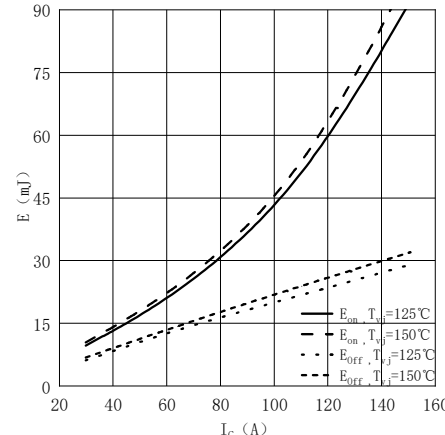
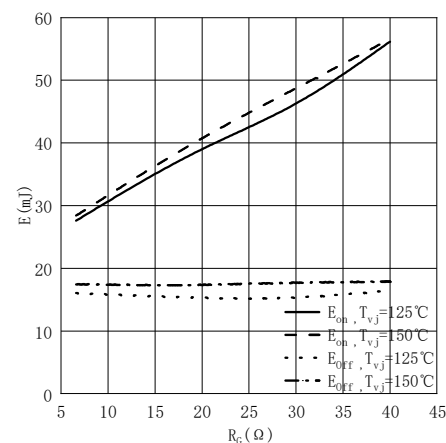
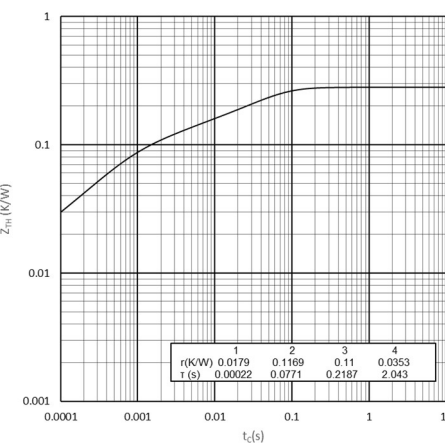
Characteristic Values / 特征值

Item	Symbol	Conditions	Min.	Typ.	Max.	Units
正向电压 Forward voltage	V_F	$I_F=75A$	$T_{vj}=25^{\circ}C$	1.59	2.25	V
			$T_{vj}=125^{\circ}C$	1.72		V
			$T_{vj}=150^{\circ}C$	1.71		V
反向恢复峰值电流 Peak reverse recovery current	I_{RM}	$I_F=75A$	$T_{vj}=25^{\circ}C$	85		A
			$T_{vj}=125^{\circ}C$	101		A
			$T_{vj}=150^{\circ}C$	108		A
恢复电荷 Recovery charge	Q_r	$-di_r/dt_{off}=1100A/\mu s$ $V_R=900V$ $V_{GE}=-15V$	$T_{vj}=25^{\circ}C$	23.5		μC
			$T_{vj}=125^{\circ}C$	32.9		μC
			$T_{vj}=150^{\circ}C$	36.2		μC
反向恢复损耗 (每脉冲) Reverse recovery energy (per pulse)	E_{rec}		$T_{vj}=25^{\circ}C$	11.8		mJ
			$T_{vj}=125^{\circ}C$	17.8		mJ
			$T_{vj}=150^{\circ}C$	19.6		mJ
结-外壳热阻 Thermal resistance, junction to case	R_{thJC}	Per diode / 每个二极管			0.48	K/W
工作温度 Temperature under switching conditions	T_{vjop}		-40		150	°C

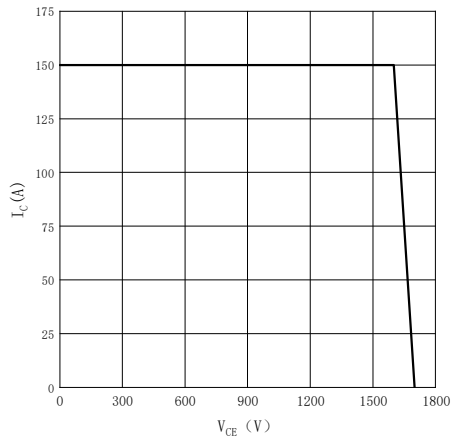
Module / 模块

Item	Symbol	Conditions	Value	Units
绝缘测试电压 Isolation test voltage	V_{ISOL}	RMS, f=50Hz, t=1min	4.0	kV
模块基板材料 Material of module baseplate			Cu	
内部绝缘 Internal isolation		基本绝缘 (class 1, IEC 61140) Basic insulation (class 1, IEC 61140)	Al_2O_3	
爬电距离 Creepage distance		端子-散热片 / terminal to heatsink 端子-端子/terminal to terminal	17 20	mm
电气间隙 Clearance		端子-散热片 / terminal to heatsink 端子-端子/terminal to terminal	17 9.5	mm
相对电痕指数 Comparative tracking index	CTI		>200	

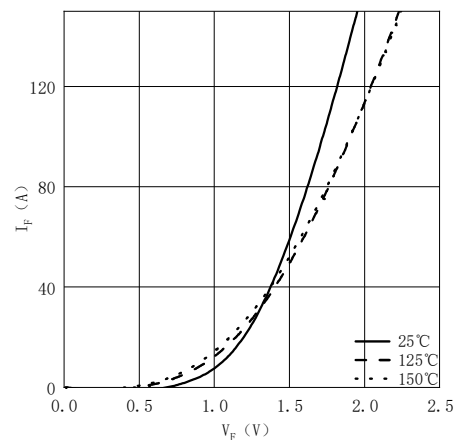
Item	Symbol	Conditions	Min.	Typ.	Max.	Units
杂散电感, 模块 Stray inductance module	L_{SCE}			30		nH
模块引脚电阻, 端子-芯片 Module Lead Resistance, Terminals-Chip	$R_{CC'+EE'}$ $R_{AA'+CC'}$			0.65		m Ω
储存温度 Storage temperature	T_{stg}		-40		125	$^{\circ}C$
模块安装的安装扭距 Mounting torque for module mounting	M	M6	3.00		5.00	Nm
端子联接扭距 Terminal connection torque	M	M5	3.00		5.00	Nm
重量 Weight	G			160		g

<p>输出特性 IGBT, 逆变器 (典型) Output characteristic IGBT, Inverter (typical) $I_C = f(V_{CE})$ $V_{GE} = 15V$</p>	<p>输出特性 IGBT, 逆变器 (典型) Output characteristic IGBT, Inverter (typical) $I_C = f(V_{CE})$ $T_{vj} = 150^\circ C$</p>										
											
<p>传输特性 IGBT, 逆变器(典型) Transfer characteristic IGBT, Inverter (typical) $I_C = f(V_{GE})$ $V_{CE} = 20V$</p>	<p>开关损耗 IGBT, 逆变器 (典型) Switching losses IGBT, Inverter (typical) $E = f(I_C)$ $V_{GE} = \pm 15V, R_G = 6.6\Omega, V_{CE} = 900V$</p>										
											
<p>开关损耗 IGBT, 逆变器 (典型) Switching losses IGBT, Inverter (typical) $E = f(R_G)$ $V_{GE} = \pm 15V, I_C = 75A, V_{CE} = 900V$</p>	<p>瞬态热阻抗 IGBT, 逆变器 Transient thermal impedance IGBT, Inverter $Z_{thjc} = f(t)$</p>										
	 <table border="1" data-bbox="1053 1825 1324 1926"> <tr> <td>r (K/W)</td> <td>0.0179</td> <td>0.1169</td> <td>0.11</td> <td>0.0353</td> </tr> <tr> <td>T (s)</td> <td>0.00022</td> <td>0.0771</td> <td>0.2167</td> <td>2.043</td> </tr> </table>	r (K/W)	0.0179	0.1169	0.11	0.0353	T (s)	0.00022	0.0771	0.2167	2.043
r (K/W)	0.0179	0.1169	0.11	0.0353							
T (s)	0.00022	0.0771	0.2167	2.043							

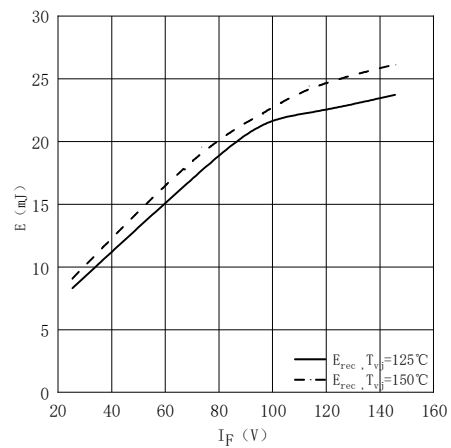
反偏安全工作区 IGBT, 逆变器 (RBSOA)
Reverse bias safe operating area IGBT, Inverter (RBSOA)
 $I_C=f(V_{CE})$
 $V_{GE}=\pm 15V, R_{Goff}=6.6\Omega, T_{vj}=150^\circ C$



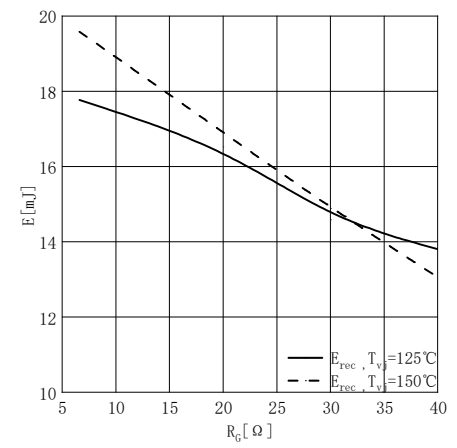
正向偏压特性 二极管, 逆变器 (典型)
Forward characteristic of Diode, Inverter (typical)
 $I_F=f(V_F)$



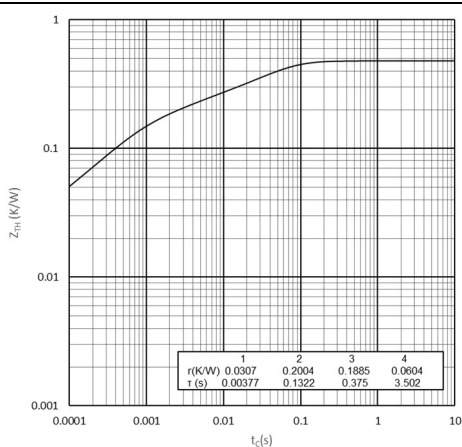
开关损耗 二极管, 逆变器 (典型)
Switching losses Diode, Inverter (typical)
 $E_{rec}=f(I_F)$
 $R_G=6.6\Omega, V_{CE}=900V$



开关损耗 二极管, 逆变器 (典型)
Switching losses Diode, Inverter (typical)
 $E_{rec}=f(R_G)$
 $I_F=75A, V_{CE}=900V$



瞬态热阻抗二极管, 逆变器
Transient thermal impedance Diode, Inverter
 $Z_{thJC}=f(t)$



1	2	3	4
$r(K/W)$ 0.0307	0.2004	0.1885	0.0604
$t_c(s)$ 0.00377	0.1322	0.375	3.502

