

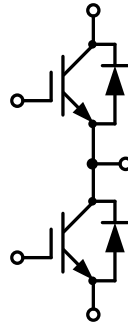
62mm Half Bridge IGBT Module 1700V/150A

PRODUCT FEATURES 电气特性:

- 1700V 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



Equivalent Circuit and Package E6 Series



$$V_{CES} = 1700V, I_{C\ nom} = 150A / I_{CRM} = 300A$$

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}	1700	V
连续集电极直流电流 Continuous DC collector current	$T_C = 100^{\circ}C, T_{vj\ max} = 175^{\circ}C$	$I_{C\ nom}$	150	A
集电极重复峰值电流 Repetitive peak collector current	$t_p = 1\ ms$	I_{CRM}	300	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}C, T_{vj\ max} = 175^{\circ}C$	P_{tot}	1071	W
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	$V_{GE} = 15V, I_C = 150A$ $V_{GE} = 15V, I_C = 150A$ $V_{GE} = 15V, I_C = 150A$	$T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 150^{\circ}C$		1.93 2.25 2.34	2.35	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 6mA, V_{GE} = V_{CE}$	$T_{vj} = 25^{\circ}C$				
内部栅极电阻 Internal gate resistor		R_{Gint}		4.30		Ω
输入电容	$f = 1MHz, V_{CE} = 25\ V, V_{GE} = 0\ V$	$T_{vj} = 25^{\circ}C$		17.20		nF

SLG150R170E6

Input capacitance					
反向传输电容 Reverse transfer capacitance		C_{res}		0.50	
集电极-发射极截止电流 Collector-emitter cut-off current	$V_{CE}=1700V, V_{GE}=0V$ $T_{vj}=25^{\circ}C$	I_{CES}			1 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}			150 nA
开通延迟时间 Turn-on delay time	$I_C=150A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=4.8\Omega$ (电感负载) / (inductive load) $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$t_{d\ on}$		189 221 234	
上升时间 Rise time	$I_C=150A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=4.8\Omega$ (电感负载) / (inductive load) $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	t_r		55 61 63	
关断延迟时间 Turn-off delay time	$I_C=150A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=4.8\Omega$ (电感负载) / (inductive load) $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	$t_{d\ off}$		419 491 505	ns
下降时间 Fall time	$I_C=150A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=4.8\Omega$ (电感负载) / (inductive load) $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	t_f		335 417 436	
开通损耗能量（每脉冲） Turn-on energy loss per pulse	$I_C=150A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=4.8\Omega$ (电感负载) / (inductive load) $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	E_{on}		29.92 40.98 45.47	mJ
关断损耗能量（每脉冲） Turn-off energy loss per pulse	$I_C=150A, V_{CE}=900V$ $V_{GE}=\pm 15V, R_G=4.8\Omega$ (电感负载) / (inductive load) $T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	E_{off}		28.64 35.68 38.29	
短路数据 SC data	$V_{GE}\leq 15V, V_{ce}=1000V$ $V_{CEmax}=V_{CES}-L_{sCE}\cdot di/dt \quad t_p\leq 10\mu s, T_{vj}=150^{\circ}C$	I_{sc}		800	A
结-外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT	R_{thJC}			0.14 K/W
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}	1700	V
连续正向直流电流 Continuous DC forward current		I_F	150	A
正向重复峰值电流 Repetitive peak forward current	$t_p=1ms$	I_{FRM}	300	A
I^2t 值 I^2t value	$t_p=10ms, \sin 180^{\circ}, T_j=125^{\circ}C$	I^2t	7000	A^2s

特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F=150\text{A}$, $V_{GE}=0\text{V}$ $T_{vj}=25^\circ\text{C}$ $I_F=150\text{A}$, $V_{GE}=0\text{V}$ $T_{vj}=125^\circ\text{C}$ $I_F=150\text{A}$, $V_{GE}=0\text{V}$ $T_{vj}=150^\circ\text{C}$	V_F		2.18 2.33 2.35	2.70	V
反向恢复峰值电流 Peak reverse recovery current	$I_F=150\text{A}$ $T_{vj}=25^\circ\text{C}$ $-di_F/dt=1650\text{A}/\mu\text{s}$ ($T_{vj}=150^\circ\text{C}$) $T_{vj}=125^\circ\text{C}$ $V_R=900\text{V}$, $V_{GE}=-15\text{V}$ $T_{vj}=150^\circ\text{C}$	I_{RM}		93 106 108		A
恢复电荷 Recovered charge	$I_F=150\text{A}$ $T_{vj}=25^\circ\text{C}$ $-di_F/dt=1650\text{A}/\mu\text{s}$ ($T_{vj}=150^\circ\text{C}$) $T_{vj}=125^\circ\text{C}$ $V_R=900\text{V}$, $V_{GE}=-15\text{V}$ $T_{vj}=150^\circ\text{C}$	Q_r		23.20 40.90 44.50		μC
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=150\text{A}$ $T_{vj}=25^\circ\text{C}$ $-di_F/dt=1650\text{A}/\mu\text{s}$ ($T_{vj}=150^\circ\text{C}$) $T_{vj}=125^\circ\text{C}$ $V_R=900\text{V}$, $V_{GE}=-15\text{V}$ $T_{vj}=150^\circ\text{C}$	E_{rec}		12.63 23.34 25.21		mJ
结-外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode	R_{thJC}			0.16	K/W
在开关状态下温度 Temperature under switching conditions		$T_{vj\text{ op}}$	-40		150	$^\circ\text{C}$

模块 / Module

Parameter	Conditions	Symbol	Value			Unit
绝缘测试电压 Isolation test voltage	RMS, $f=50\text{Hz}$, $t=1\text{min}$	V_{ISOL}	4000			V
内部绝缘 Internal isolation			Al_2O_3			
储存温度 Storage temperature		T_{stg}	-40		125	$^\circ\text{C}$
模块安装的扭矩 Mounting torque for modul mounting		M	3.0		6.0	Nm
重量 Weight		W		316		g

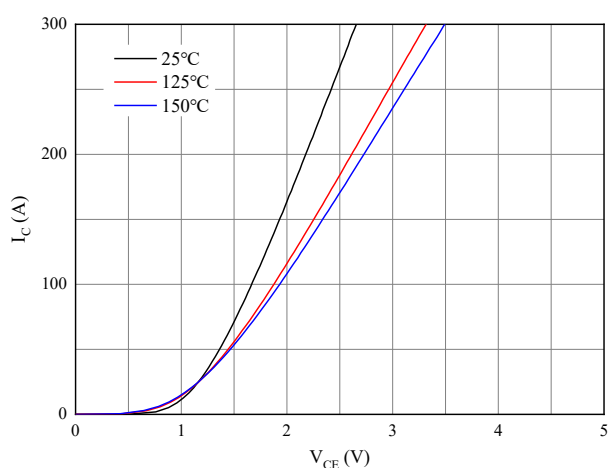


图 1. 典型输出特性 ($V_{GE}=15V$)

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

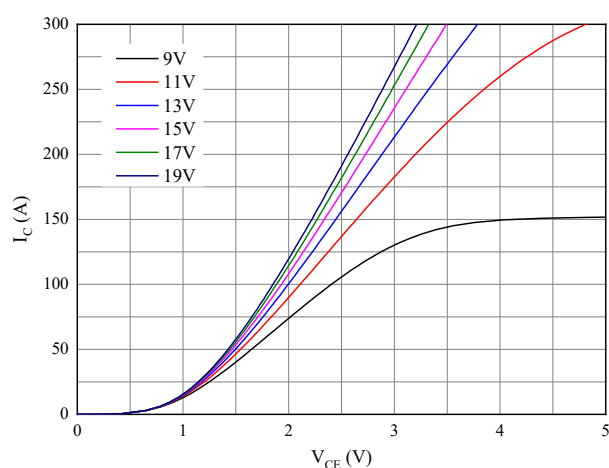


图 2. 典型输出特性 ($T_{vj}=150^{\circ}C$)

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

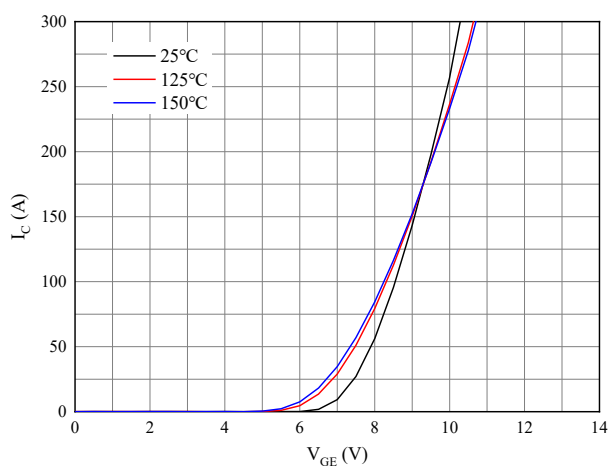


图 3. 典型传输特性 ($V_{CE}=20V$)

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

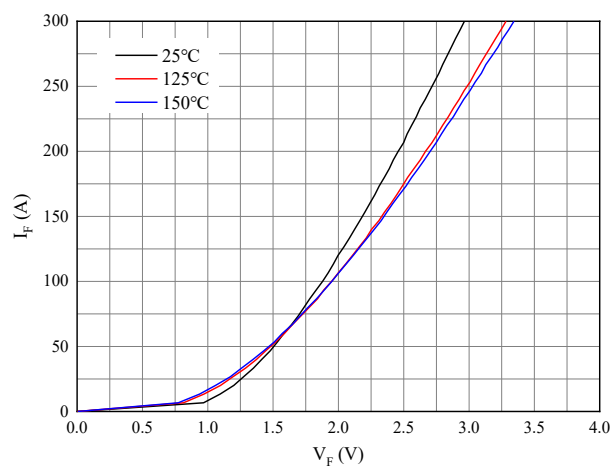


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

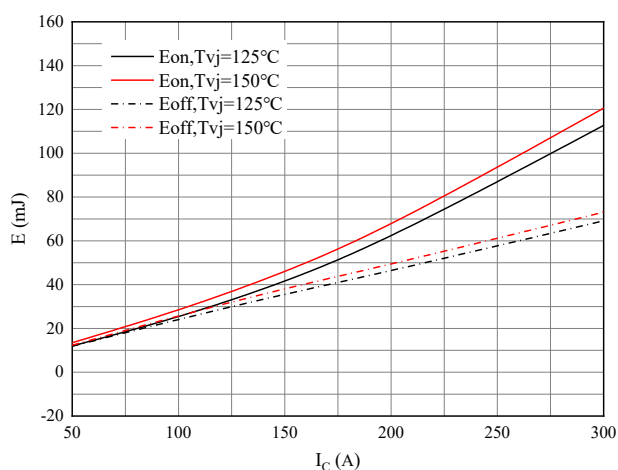


图 5. 开关损耗 逆变器

Figure 5. Switching losses of IGBT

$V_{GE}=\pm 15V$, $R_{Gon}=4.8\Omega$, $R_{Goff}=4.8\Omega$, $V_{CE}=900V$

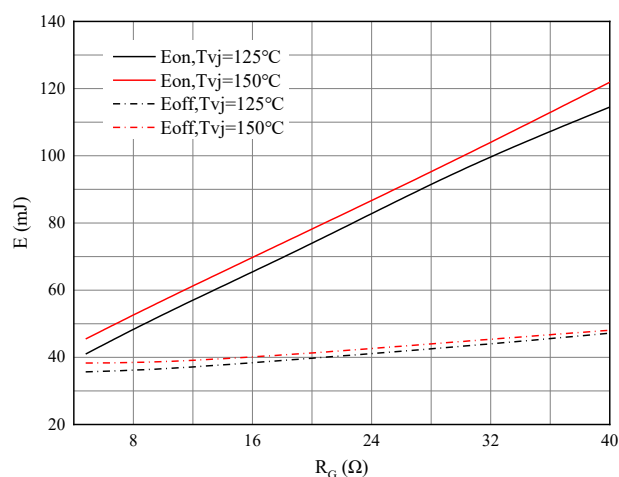


图 6. 开关损耗 逆变器

Figure 6. Switching losses of IGBT

$V_{GE}=\pm 15V$, $I_C=150A$, $V_{CE}=900V$

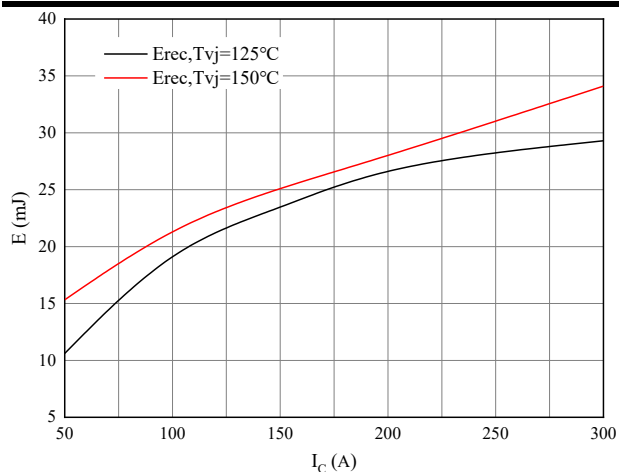


图 7. 开关损耗 二极管
Figure 7. Switching losses of Diode
 $R_{Gon}=4.8\ \Omega$, $V_{CE}=900V$

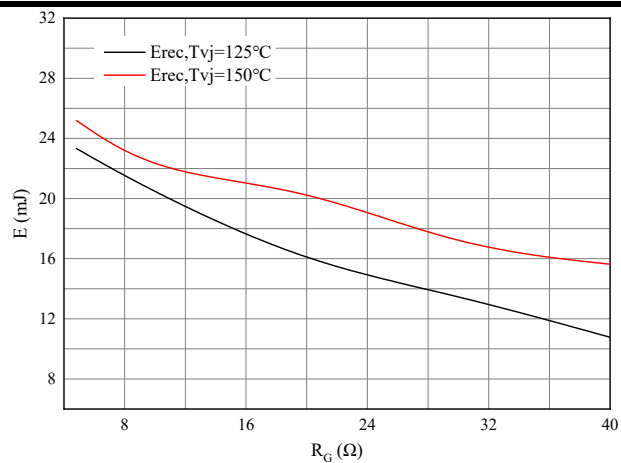


图 8. 开关损耗 二极管
Figure 8. Switching losses of Diode
 $I_F=150A$, $V_{CE}=900V$

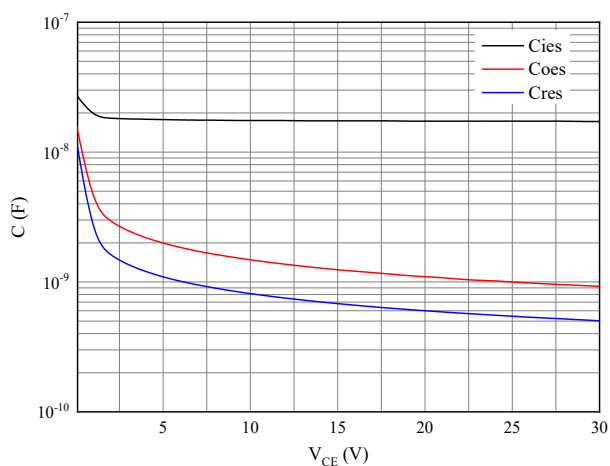
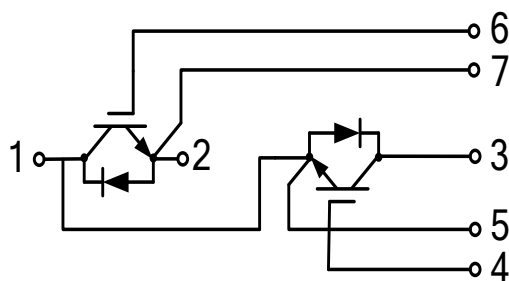
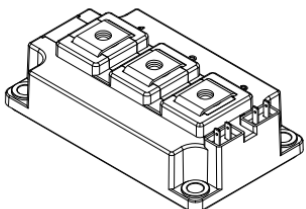
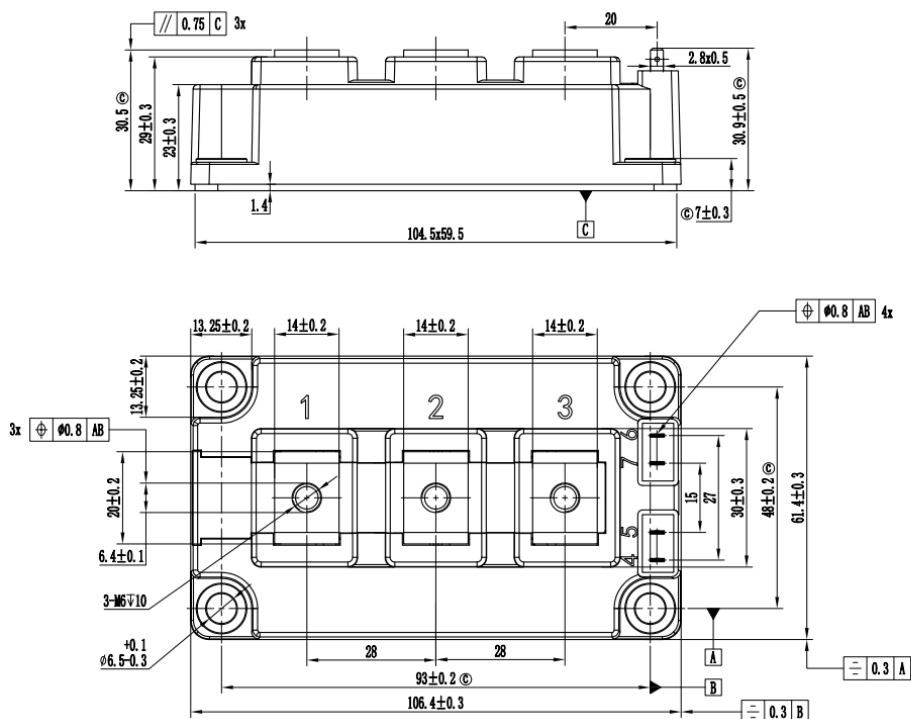


图 9. 电容特性
Figure 9. Capacitance characteristic

接线图 / Circuit diagram



封装尺寸 / Package outlines



注: 1. © 尺寸为关键管控尺寸
2. 未标注公差按GB/T1804-m执行

Unit:mm

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