

$V_{CES} = 1200V$   
 $I_{C\ nom} = 75A / I_{CRM} = 150A$

**典型应用**

- 三电平应用
- 太阳能应用

**电气特性**

- 高速IGBT H3
- 低电感设计
- 低开关损耗
- 低  $V_{CEsat}$

**机械特性**

- 3 kV 交流 1分钟 绝缘
- 低热阻的三氧化二铝 (  $Al_2O_3$  衬底
- 紧凑型设计
- PressFIT 压接技术
- 集成的安装夹使安装坚固

**Typical Applications**

- 3-level-applications
- Solar applications

**Electrical Features**

- High speed IGBT H3
- Low inductive design
- Low switching losses
- Low  $V_{CEsat}$

**Mechanical Features**

- 3 kV AC 1min insulation
- $Al_2O_3$  substrate with low thermal resistance
- Compact design
- PressFIT contact technology
- Rugged mounting due to integrated mounting clamps

**Module Label Code**

**Barcode Code 128**



**DMX - Code**



**Content of the Code**

	<b>Digit</b>
Module Serial Number	1 - 5
Module Material Number	6 - 11
Production Order Number	12 - 19
Datecode (Production Year)	20 - 21
Datecode (Production Week)	22 - 23

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**IGBT, T1-T4 / IGBT, T1-T4**

**最大额定值 / Maximum Rated Values**

集电极 - 发射极电压 Collector-emitter voltage	$T_{vj} = 25^{\circ}\text{C}$	$V_{CES}$	1200	V
集电极电流 Implemented collector current		$I_{CN}$	75	A
连续集电极直流电流 Continuous DC collector current	$T_C = 100^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$ $T_C = 25^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	$I_{C\text{nom}}$ $I_C$	30 45	A A
集电极重复峰值电流 Repetitive peak collector current	$t_P = 1\text{ms}$	$I_{CRM}$	150	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	$P_{\text{tot}}$	275	W
栅极 - 发射极峰值电压 Gate-emitter peak voltage		$V_{GES}$	+/-20	V

**特征值 / Characteristic Values**

			min.	typ.	max.	
集电极 - 发射极饱和电压 Collector-emitter saturation voltage	$I_C = 30\text{A}, V_{GE} = 15\text{V}$ $I_C = 30\text{A}, V_{GE} = 15\text{V}$ $I_C = 30\text{A}, V_{GE} = 15\text{V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$V_{CE\text{sat}}$	1,45 1,55 1,60	1,70	V V V
栅极阈值电压 Gate threshold voltage	$I_C = 2,60\text{mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$		$V_{G\text{Eth}}$	5,00	5,80	6,50 V
栅极电荷 Gate charge	$V_{GE} = -15\text{V} \dots +15\text{V}$		$Q_G$	0,57		$\mu\text{C}$
内部栅极电阻 Internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$		$R_{G\text{int}}$	0,0		$\Omega$
输入电容 Input capacitance	$f = 1\text{MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{V}, V_{GE} = 0\text{V}$		$C_{\text{ies}}$	4,40		nF
反向传输电容 Reverse transfer capacitance	$f = 1\text{MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{V}, V_{GE} = 0\text{V}$		$C_{\text{res}}$	0,235		nF
集电极-发射极截止电流 Collector-emitter cut-off current	$V_{CE} = 1200\text{V}, V_{GE} = 0\text{V}, T_{vj} = 25^{\circ}\text{C}$		$I_{CES}$		1,0	mA
栅极-发射极漏电流 Gate-emitter leakage current	$V_{CE} = 0\text{V}, V_{GE} = 20\text{V}, T_{vj} = 25^{\circ}\text{C}$		$I_{GES}$		100	nA
开通延迟时间(电感负载) Turn-on delay time, inductive load	$I_C = 30\text{A}, V_{CE} = 400\text{V}$ $V_{GE} = 15\text{V}$ $R_{G\text{on}} = 6,8\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{d\text{on}}$	0,03 0,03 0,03		$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
上升时间(电感负载) Rise time, inductive load	$I_C = 30\text{A}, V_{CE} = 400\text{V}$ $V_{GE} = 15\text{V}$ $R_{G\text{on}} = 6,8\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_r$	0,01 0,012 0,012		$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
关断延迟时间(电感负载) Turn-off delay time, inductive load	$I_C = 30\text{A}, V_{CE} = 400\text{V}$ $V_{GE} = 15\text{V}$ $R_{G\text{off}} = 6,8\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{d\text{off}}$	0,25 0,32 0,34		$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
下降时间(电感负载) Fall time, inductive load	$I_C = 30\text{A}, V_{CE} = 400\text{V}$ $V_{GE} = 15\text{V}$ $R_{G\text{off}} = 6,8\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_f$	0,025 0,04 0,045		$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
开通损耗能量(每脉冲) Turn-on energy loss per pulse	$I_C = 30\text{A}, V_{CE} = 400\text{V}, L_S = 40\text{nH}$ $V_{GE} = 15\text{V}, di/dt = 2600\text{A}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $R_{G\text{on}} = 6,8\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$E_{\text{on}}$	0,40 0,60 0,70		mJ mJ mJ
关断损耗能量(每脉冲) Turn-off energy loss per pulse	$I_C = 30\text{A}, V_{CE} = 400\text{V}, L_S = 40\text{nH}$ $V_{GE} = 15\text{V}, du/dt = 2400\text{V}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $R_{G\text{off}} = 6,8\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$E_{\text{off}}$	1,05 1,60 1,75		mJ mJ mJ
短路数据 SC data	$V_{GE} \leq 15\text{V}, V_{CC} = 800\text{V}$ $V_{CE\text{max}} = V_{CES} - L_{SCE} \cdot di/dt$ $t_P \leq 10\mu\text{s}, T_{vj} = 150^{\circ}\text{C}$		$I_{SC}$	270		A
结 - 外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		$R_{\text{thJC}}$	0,500	0,550	K/W

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外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个 IGBT / per IGBT $\lambda_{\text{Paste}} = 1 \text{ W}/(\text{m}\cdot\text{K})$ / $\lambda_{\text{grease}} = 1 \text{ W}/(\text{m}\cdot\text{K})$	$R_{\text{thCH}}$		0,450		K/W
在开关状态下温度 Temperature under switching conditions		$T_{\text{vj op}}$	-40		150	°C

## 二极管, D1 / D4 / Diode, D1 / D4

### 最大额定值 / Maximum Rated Values

反向重复峰值电压 Repetitive peak reverse voltage	$T_{\text{vj}} = 25^\circ\text{C}$	$V_{\text{RRM}}$		1200		V
连续正向直流电流 Continuous DC forward current		$I_{\text{F}}$		30		A
正向重复峰值电流 Repetitive peak forward current	$t_{\text{p}} = 1 \text{ ms}$	$I_{\text{FRM}}$		50		A
$I^2t$ -值 $I^2t$ - value	$V_{\text{R}} = 0 \text{ V}, t_{\text{p}} = 10 \text{ ms}, T_{\text{vj}} = 125^\circ\text{C}$ $V_{\text{R}} = 0 \text{ V}, t_{\text{p}} = 10 \text{ ms}, T_{\text{vj}} = 150^\circ\text{C}$	$I^2t$		90,0 75,0		$\text{A}^2\text{s}$ $\text{A}^2\text{s}$

### 特征值 / Characteristic Values

				min.	typ.	max.	
正向电压 Forward voltage	$I_{\text{F}} = 30 \text{ A}, V_{\text{GE}} = 0 \text{ V}$ $I_{\text{F}} = 30 \text{ A}, V_{\text{GE}} = 0 \text{ V}$ $I_{\text{F}} = 30 \text{ A}, V_{\text{GE}} = 0 \text{ V}$	$T_{\text{vj}} = 25^\circ\text{C}$ $T_{\text{vj}} = 125^\circ\text{C}$ $T_{\text{vj}} = 150^\circ\text{C}$	$V_{\text{F}}$		1,85 1,90 1,90	2,40	V V V
反向恢复峰值电流 Peak reverse recovery current	$I_{\text{F}} = 30 \text{ A}, -di_{\text{F}}/dt = 2600 \text{ A}/\mu\text{s} (T_{\text{vj}}=150^\circ\text{C})$ $V_{\text{R}} = 400 \text{ V}$ $V_{\text{GE}} = -15 \text{ V}$	$T_{\text{vj}} = 25^\circ\text{C}$ $T_{\text{vj}} = 125^\circ\text{C}$ $T_{\text{vj}} = 150^\circ\text{C}$	$I_{\text{RM}}$		72,0 80,0 82,0		A A A
恢复电荷 Recovered charge	$I_{\text{F}} = 30 \text{ A}, -di_{\text{F}}/dt = 2600 \text{ A}/\mu\text{s} (T_{\text{vj}}=150^\circ\text{C})$ $V_{\text{R}} = 400 \text{ V}$ $V_{\text{GE}} = -15 \text{ V}$	$T_{\text{vj}} = 25^\circ\text{C}$ $T_{\text{vj}} = 125^\circ\text{C}$ $T_{\text{vj}} = 150^\circ\text{C}$	$Q_{\text{r}}$		2,35 2,85 3,70		$\mu\text{C}$ $\mu\text{C}$ $\mu\text{C}$
反向恢复损耗 (每脉冲) Reverse recovery energy	$I_{\text{F}} = 30 \text{ A}, -di_{\text{F}}/dt = 2600 \text{ A}/\mu\text{s} (T_{\text{vj}}=150^\circ\text{C})$ $V_{\text{R}} = 400 \text{ V}$ $V_{\text{GE}} = -15 \text{ V}$	$T_{\text{vj}} = 25^\circ\text{C}$ $T_{\text{vj}} = 125^\circ\text{C}$ $T_{\text{vj}} = 150^\circ\text{C}$	$E_{\text{rec}}$		0,80 1,30 1,35		mJ mJ mJ
结 - 外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		$R_{\text{thJC}}$		0,950	1,05	K/W
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个二极管 / per diode $\lambda_{\text{Paste}} = 1 \text{ W}/(\text{m}\cdot\text{K})$ / $\lambda_{\text{grease}} = 1 \text{ W}/(\text{m}\cdot\text{K})$		$R_{\text{thCH}}$		0,850		K/W
在开关状态下温度 Temperature under switching conditions			$T_{\text{vj op}}$	-40		150	°C

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## IGBT, T2 / T3 / IGBT, T2 / T3

### 最大额定值 / Maximum Rated Values

集电极 - 发射极电压 Collector-emitter voltage	$T_{vj} = 25^{\circ}\text{C}$	$V_{CES}$	650	V
连续集电极直流电流 Continuous DC collector current	$T_C = 80^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$ $T_C = 25^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	$I_{C\text{nom}}$ $I_C$	30 45	A A
集电极重复峰值电流 Repetitive peak collector current	$t_P = 1\text{ ms}$	$I_{CRM}$	60	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	$P_{\text{tot}}$	150	W
栅极 - 发射极峰值电压 Gate-emitter peak voltage		$V_{GES}$	+/-20	V

### 特征值 / Characteristic Values

			min.	typ.	max.		
集电极 - 发射极饱和电压 Collector-emitter saturation voltage	$I_C = 30\text{ A}, V_{GE} = 15\text{ V}$ $I_C = 30\text{ A}, V_{GE} = 15\text{ V}$ $I_C = 30\text{ A}, V_{GE} = 15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$V_{CE\text{sat}}$	1,55 1,70 1,80	2,00	V V V	
栅极阈值电压 Gate threshold voltage	$I_C = 0,30\text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$		$V_{GEth}$	4,90	5,80	6,50	V
栅极电荷 Gate charge	$V_{GE} = -15\text{ V} \dots +15\text{ V}$		$Q_G$	0,30			$\mu\text{C}$
内部栅极电阻 Internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$		$R_{Gint}$	0,0			$\Omega$
输入电容 Input capacitance	$f = 1\text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$		$C_{ies}$	1,65			nF
反向传输电容 Reverse transfer capacitance	$f = 1\text{ MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$		$C_{res}$	0,051			nF
集电极-发射极截止电流 Collector-emitter cut-off current	$V_{CE} = 650\text{ V}, V_{GE} = 0\text{ V}, T_{vj} = 25^{\circ}\text{C}$		$I_{CES}$			1,0	mA
栅极-发射极漏电流 Gate-emitter leakage current	$V_{CE} = 0\text{ V}, V_{GE} = 20\text{ V}, T_{vj} = 25^{\circ}\text{C}$		$I_{GES}$			100	nA
开通延迟时间(电感负载) Turn-on delay time, inductive load	$I_C = 30\text{ A}, V_{CE} = 400\text{ V}$ $V_{GE} = 15\text{ V}$ $R_{Gon} = 10\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{don}$	0,022 0,025 0,025			$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
上升时间(电感负载) Rise time, inductive load	$I_C = 30\text{ A}, V_{CE} = 400\text{ V}$ $V_{GE} = 15\text{ V}$ $R_{Gon} = 10\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_r$	0,01 0,012 0,012			$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
关断延迟时间(电感负载) Turn-off delay time, inductive load	$I_C = 30\text{ A}, V_{CE} = 400\text{ V}$ $V_{GE} = 15\text{ V}$ $R_{Goff} = 10\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{doff}$	0,16 0,18 0,185			$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
下降时间(电感负载) Fall time, inductive load	$I_C = 30\text{ A}, V_{CE} = 400\text{ V}$ $V_{GE} = 15\text{ V}$ $R_{Goff} = 10\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_f$	0,025 0,037 0,04			$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
开通损耗能量(每脉冲) Turn-on energy loss per pulse	$I_C = 30\text{ A}, V_{CE} = 400\text{ V}, L_S = 40\text{ nH}$ $V_{GE} = 15\text{ V}, di/dt = 2600\text{ A}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $R_{Gon} = 10\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$E_{on}$	0,34 0,50 0,53			mJ mJ mJ
关断损耗能量(每脉冲) Turn-off energy loss per pulse	$I_C = 30\text{ A}, V_{CE} = 400\text{ V}, L_S = 40\text{ nH}$ $V_{GE} = 15\text{ V}, du/dt = 4700\text{ V}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $R_{Goff} = 10\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$E_{off}$	0,85 1,15 1,20			mJ mJ mJ
短路数据 SC data	$V_{GE} \leq 15\text{ V}, V_{CC} = 360\text{ V}$ $V_{CE\text{max}} = V_{CES} - L_{SCE} \cdot di/dt$	$t_P \leq 8\ \mu\text{s}, T_{vj} = 25^{\circ}\text{C}$ $t_P \leq 6\ \mu\text{s}, T_{vj} = 150^{\circ}\text{C}$	$I_{SC}$	210 150			A A
结 - 外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		$R_{thJC}$	0,900	1,00		K/W
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个 IGBT / per IGBT $\lambda_{\text{Paste}} = 1\text{ W}/(\text{m}\cdot\text{K}) / \lambda_{\text{grease}} = 1\text{ W}/(\text{m}\cdot\text{K})$		$R_{thCH}$	0,850			K/W
在开关状态下温度 Temperature under switching conditions			$T_{vj\text{op}}$	-40	150		$^{\circ}\text{C}$

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**二极管, D2 / D3 / Diode, D2 / D3**

**最大额定值 / Maximum Rated Values**

反向重复峰值电压 Repetitive peak reverse voltage	$T_{vj} = 25^{\circ}\text{C}$	$V_{RRM}$	650	V
连续正向直流电流 Continuous DC forward current		$I_F$	30	A
正向重复峰值电流 Repetitive peak forward current	$t_P = 1\text{ ms}$	$I_{FRM}$	60	A
I <sup>2</sup> t-值 I <sup>2</sup> t - value	$V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$	I <sup>2</sup> t	130	A <sup>2</sup> s
	$V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$		115	A <sup>2</sup> s

**特征值 / Characteristic Values**

		min.	typ.	max.	
正向电压 Forward voltage	$I_F = 30\text{ A}, V_{GE} = 0\text{ V}$		1,45	1,65	V
	$I_F = 30\text{ A}, V_{GE} = 0\text{ V}$		1,35		V
	$I_F = 30\text{ A}, V_{GE} = 0\text{ V}$		1,30		V
		$T_{vj} = 25^{\circ}\text{C}$			
	$T_{vj} = 125^{\circ}\text{C}$				
	$T_{vj} = 150^{\circ}\text{C}$				
反向恢复峰值电流 Peak reverse recovery current	$I_F = 30\text{ A}, -di_F/dt = 2600\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 400\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$	42,0		A
		$T_{vj} = 125^{\circ}\text{C}$	48,0		A
		$T_{vj} = 150^{\circ}\text{C}$	50,0		A
恢复电荷 Recovered charge	$I_F = 30\text{ A}, -di_F/dt = 2600\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 400\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$	1,80		$\mu\text{C}$
		$T_{vj} = 125^{\circ}\text{C}$	2,40		$\mu\text{C}$
		$T_{vj} = 150^{\circ}\text{C}$	2,60		$\mu\text{C}$
反向恢复损耗 (每脉冲) Reverse recovery energy	$I_F = 30\text{ A}, -di_F/dt = 2600\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 400\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$	0,45		mJ
		$T_{vj} = 125^{\circ}\text{C}$	0,65		mJ
		$T_{vj} = 150^{\circ}\text{C}$	0,73		mJ
结 - 外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode	$R_{thJC}$	1,00	1,20	K/W
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个二极管 / per diode $\lambda_{Paste} = 1\text{ W}/(\text{m}\cdot\text{K}) / \lambda_{grease} = 1\text{ W}/(\text{m}\cdot\text{K})$	$R_{thCH}$	0,700		K/W
在开关状态下温度 Temperature under switching conditions		$T_{vj\text{ op}}$	-40	150	$^{\circ}\text{C}$

**负温度系数热敏电阻 / NTC-Thermistor**

**特征值 / Characteristic Values**

		min.	typ.	max.	
额定电阻值 Rated resistance	$T_{NTC} = 25^{\circ}\text{C}$	$R_{25}$	5,00		k $\Omega$
R100 偏差 Deviation of R100	$T_{NTC} = 100^{\circ}\text{C}, R_{100} = 493\ \Omega$	$\Delta R/R$	-5	5	%
耗散功率 Power dissipation	$T_{NTC} = 25^{\circ}\text{C}$	$P_{25}$		20,0	mW
B-值 B-value	$R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298,15\text{ K}))]$	$B_{25/50}$	3375		K
B-值 B-value	$R_2 = R_{25} \exp [B_{25/80}(1/T_2 - 1/(298,15\text{ K}))]$	$B_{25/80}$	3411		K
B-值 B-value	$R_2 = R_{25} \exp [B_{25/100}(1/T_2 - 1/(298,15\text{ K}))]$	$B_{25/100}$	3433		K

根据应用手册标定

Specification according to the valid application note.

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**模块 / Module**

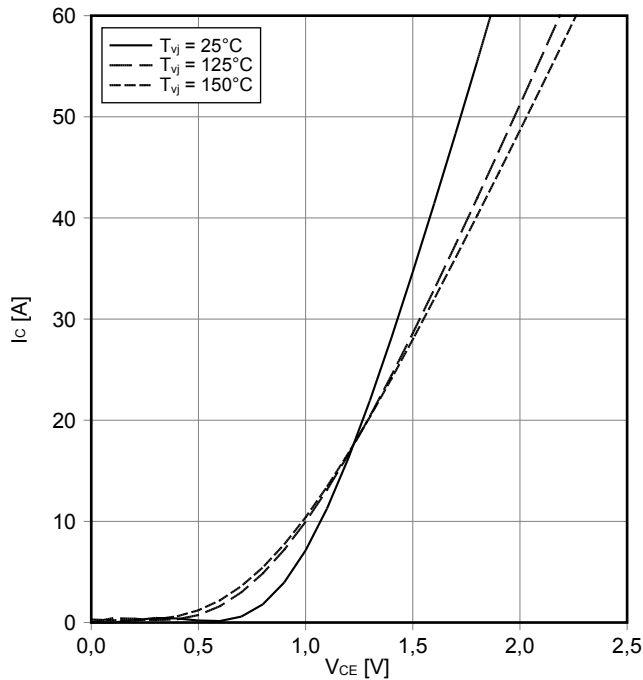
绝缘测试电压 Isolation test voltage	RMS, f = 50 Hz, t = 1 min.	V <sub>ISOL</sub>	3,0		kV
内部绝缘 Internal isolation	基本绝缘 (class 1, IEC 61140) basic insulation (class 1, IEC 61140)		Al <sub>2</sub> O <sub>3</sub>		
爬电距离 Creepage distance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal		11,5 6,3		mm
电气间隙 Clearance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal		10,0 5,0		mm
相对电痕指数 Comperative tracking index		CTI	> 200		
			min.	typ.	max.
杂散电感,模块 Stray inductance module		L <sub>sCE</sub>		30	nH
模块引线电阻,端子-芯片 Module lead resistance, terminals - chip	T <sub>c</sub> = 25°C, 每个开关 / per switch	R <sub>CC'+EE'</sub> R <sub>AA'+CC'</sub>		5,00 6,00	mΩ
储存温度 Storage temperature		T <sub>stg</sub>	-40		125 °C
Anpresskraft für mech. Bef. pro Feder mounting force per clamp		F	40	-	80 N
重量 Weight		G		24	g

Der Strom im Dauerbetrieb ist auf 25A effektiv pro Anschlusspin begrenzt.  
The current under continuous operation is limited to 25A rms per connector pin.

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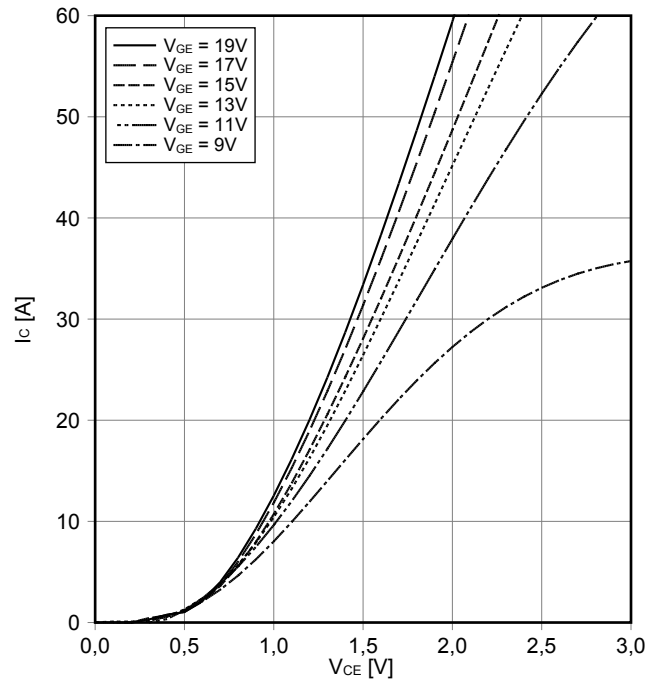
输出特性 IGBT, T1-T4 (典型)  
output characteristic IGBT, T1-T4 (typical)

$I_C = f(V_{CE})$   
 $V_{GE} = 15\text{ V}$



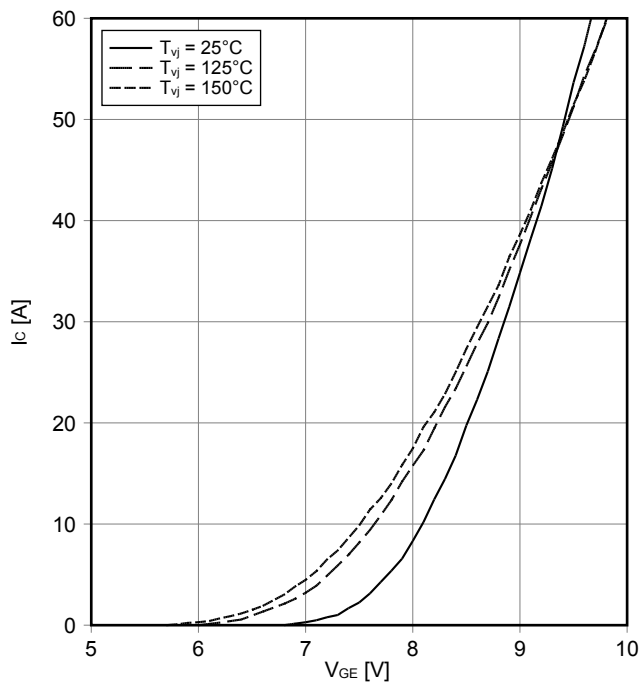
输出特性 IGBT, T1-T4 (典型)  
output characteristic IGBT, T1-T4 (typical)

$I_C = f(V_{CE})$   
 $T_{vj} = 150^\circ\text{C}$



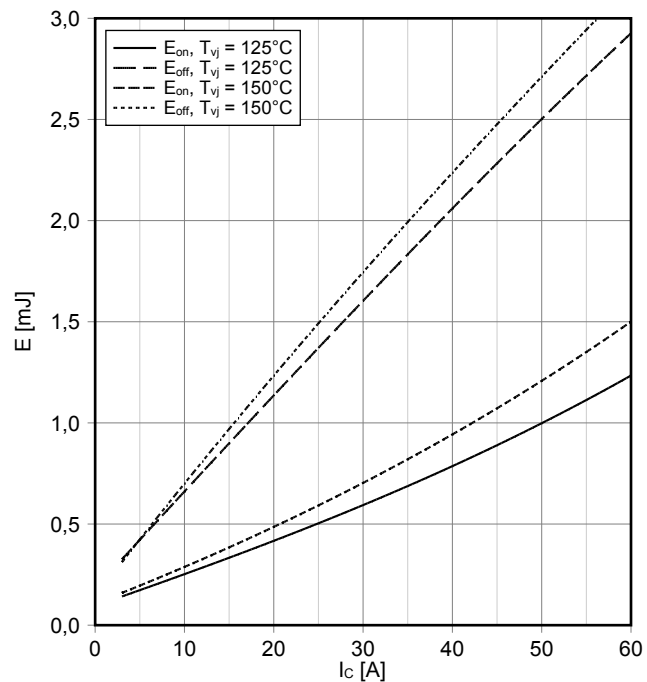
传输特性 IGBT, T1-T4 (典型)  
transfer characteristic IGBT, T1-T4 (typical)

$I_C = f(V_{GE})$   
 $V_{CE} = 20\text{ V}$



开关损耗 IGBT, T1-T4 (典型)  
switching losses IGBT, T1-T4 (typical)

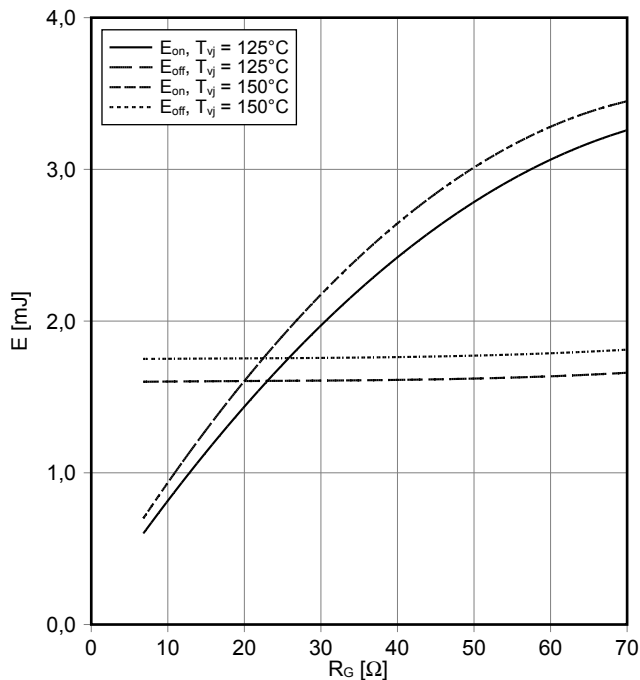
$E_{on} = f(I_C), E_{off} = f(I_C)$   
 $V_{GE} = \pm 15\text{ V}, R_{Gon} = 6.8\ \Omega, R_{Goff} = 6.8\ \Omega, V_{CE} = 400\text{ V}$



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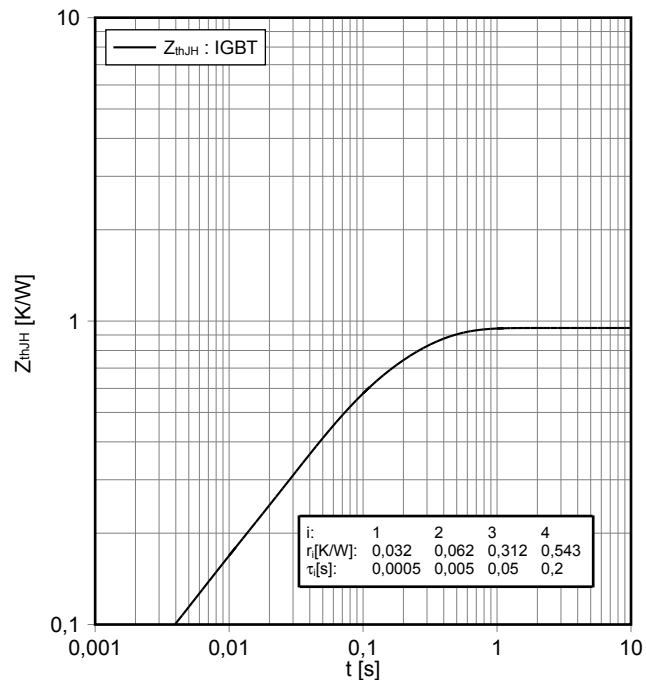
开关损耗 IGBT, T1-T4 (典型)  
switching losses IGBT, T1-T4 (typical)

$E_{on} = f(R_G)$ ,  $E_{off} = f(R_G)$   
 $V_{GE} = \pm 15\text{ V}$ ,  $I_C = 30\text{ A}$ ,  $V_{CE} = 400\text{ V}$



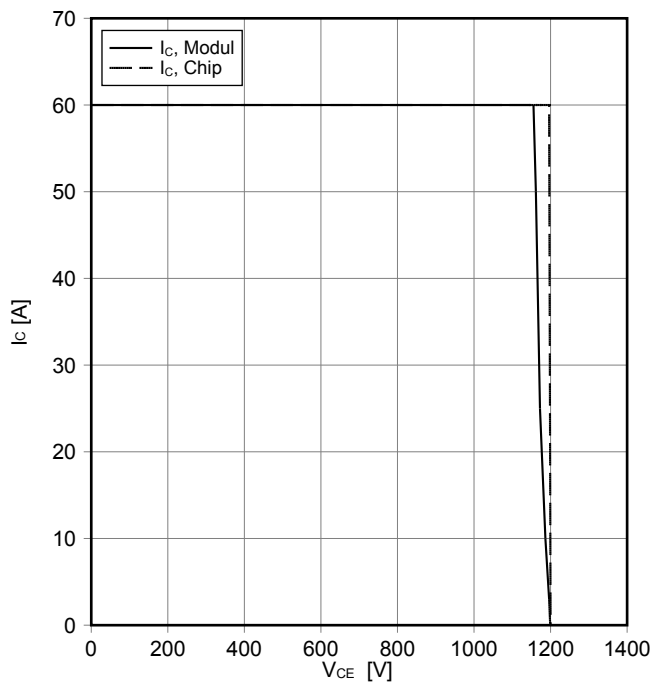
瞬态热阻抗 IGBT, T1-T4  
transient thermal impedance IGBT, T1-T4

$Z_{thJH} = f(t)$



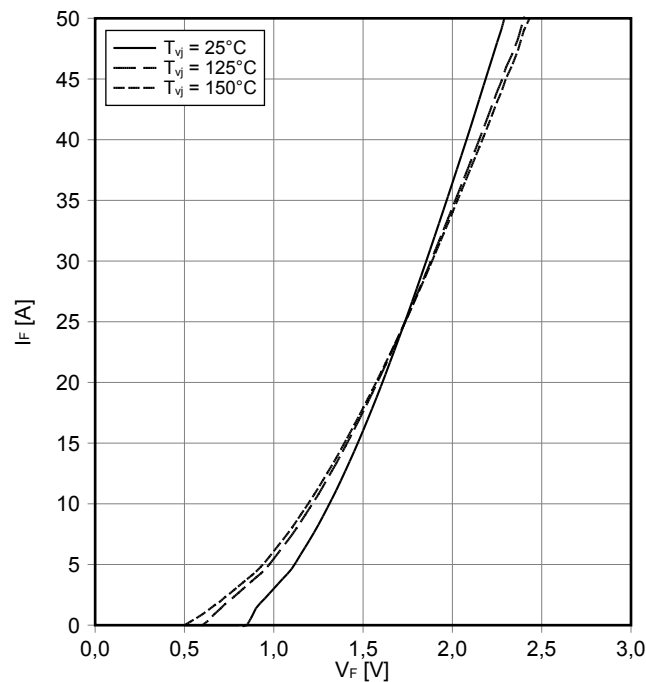
反偏安全工作区 IGBT, T1-T4 (RBSOA)  
reverse bias safe operating area IGBT, T1-T4 (RBSOA)

$I_C = f(V_{CE})$   
 $V_{GE} = \pm 15\text{ V}$ ,  $R_{Goff} = 6.8\ \Omega$ ,  $T_{vj} = 150^\circ\text{C}$



正向偏压特性 二极管, D1 / D4 (典型)  
forward characteristic of Diode, D1 / D4 (typical)

$I_F = f(V_F)$



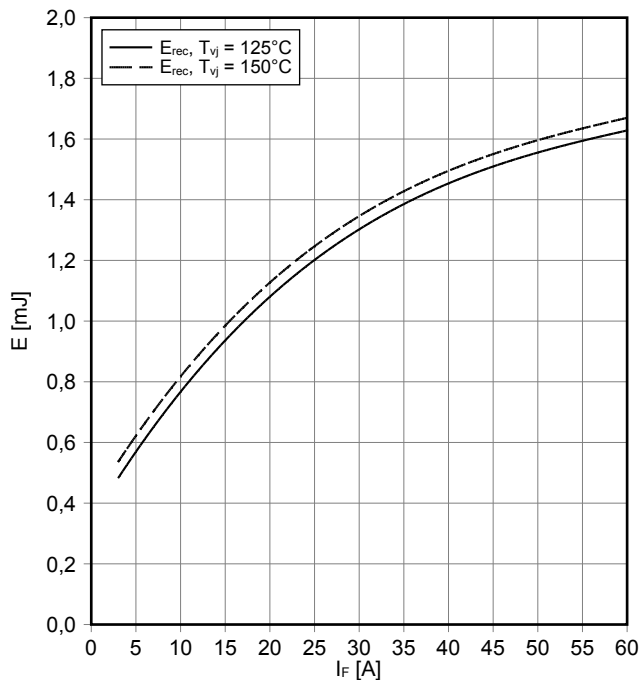
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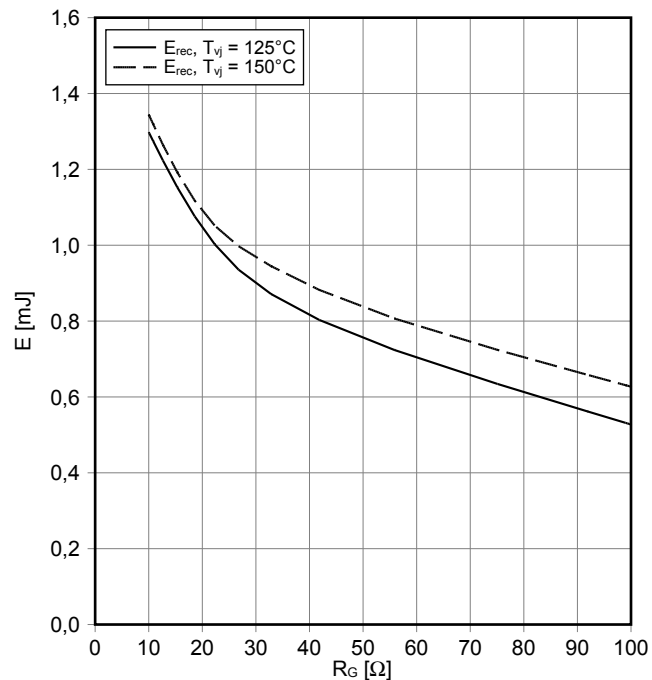
开关损耗 二极管, D1 / D4 (典型)  
switching losses Diode, D1 / D4 (typical)

$E_{rec} = f(I_F)$   
 $R_{Gon} = 10 \Omega, V_{CE} = 400 V$



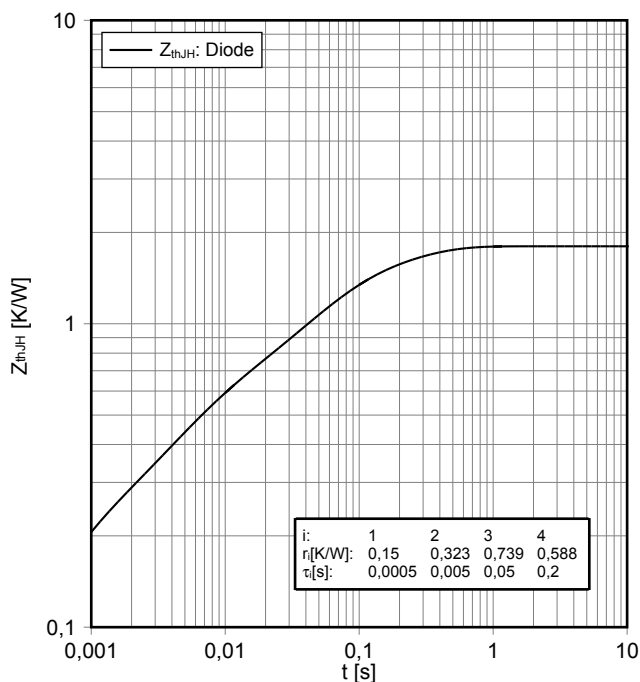
开关损耗 二极管, D1 / D4 (典型)  
switching losses Diode, D1 / D4 (typical)

$E_{rec} = f(R_G)$   
 $I_F = 30 A, V_{CE} = 400 V$



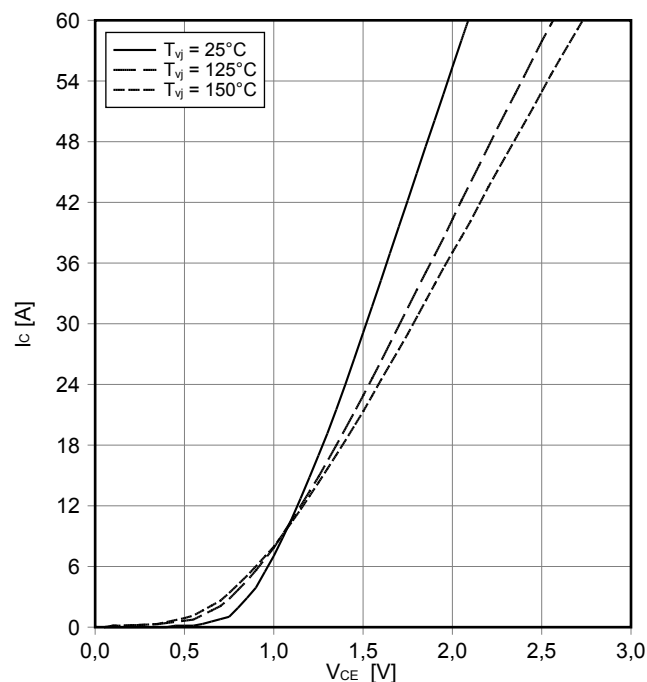
瞬态热阻抗 二极管, D1 / D4  
transient thermal impedance Diode, D1 / D4

$Z_{thJH} = f(t)$



输出特性 IGBT, T2 / T3 (典型)  
output characteristic IGBT, T2 / T3 (typical)

$I_C = f(V_{CE})$   
 $V_{GE} = 15 V$

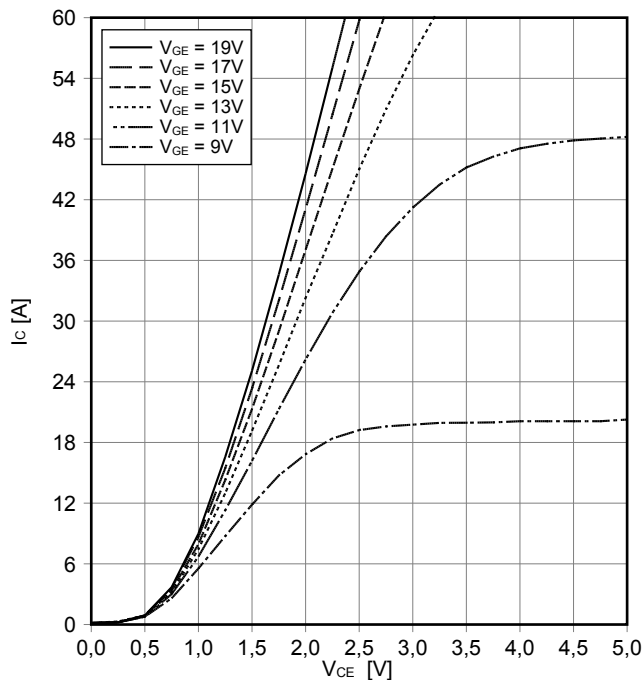


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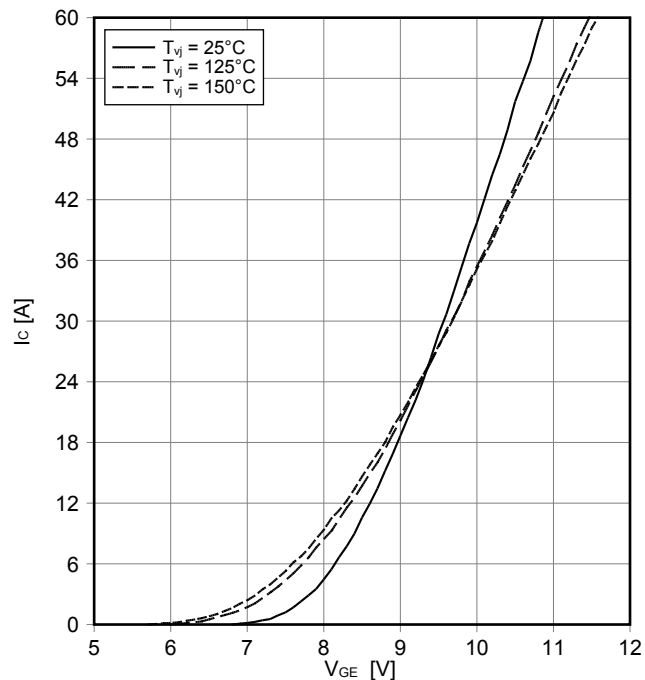
输出特性 IGBT, T2 / T3 (典型)  
output characteristic IGBT, T2 / T3 (typical)

$I_C = f(V_{CE})$   
 $T_{vj} = 150^\circ\text{C}$



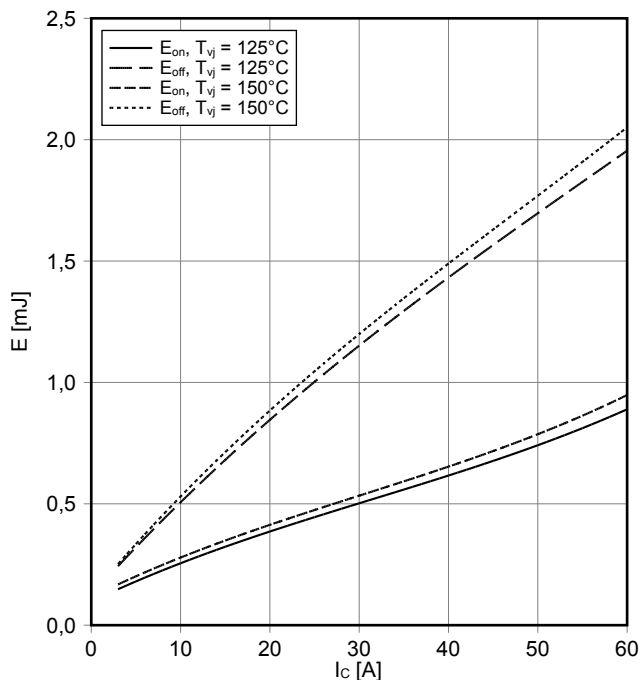
传输特性 IGBT, T2 / T3 (典型)  
transfer characteristic IGBT, T2 / T3 (typical)

$I_C = f(V_{GE})$   
 $V_{CE} = 20\text{ V}$



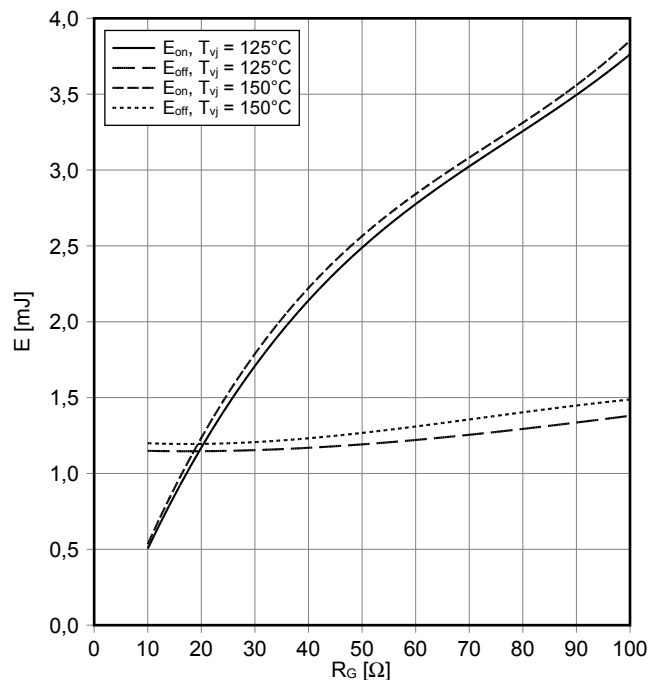
开关损耗 IGBT, T2 / T3 (典型)  
switching losses IGBT, T2 / T3 (typical)

$E_{on} = f(I_C), E_{off} = f(I_C)$   
 $V_{GE} = \pm 15\text{ V}, R_{Gon} = 10\ \Omega, R_{Goff} = 10\ \Omega, V_{CE} = 400\text{ V}$



开关损耗 IGBT, T2 / T3 (典型)  
switching losses IGBT, T2 / T3 (typical)

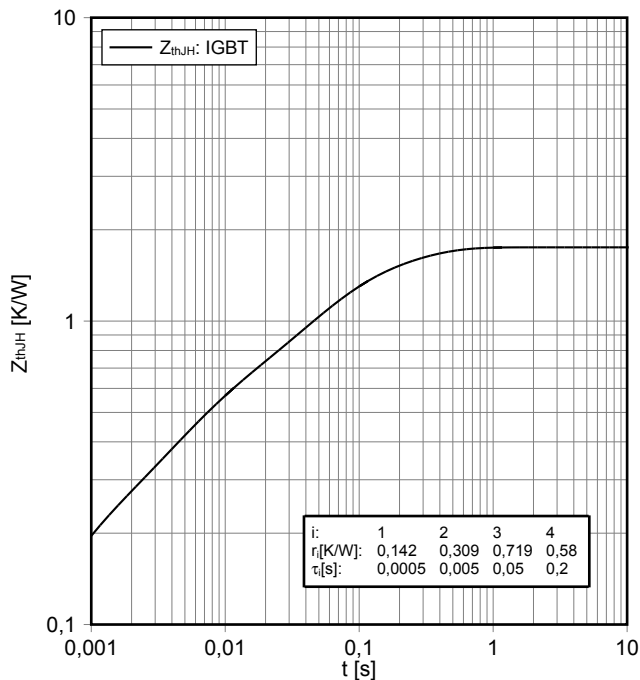
$E_{on} = f(R_G), E_{off} = f(R_G)$   
 $V_{GE} = \pm 15\text{ V}, I_C = 30\text{ A}, V_{CE} = 400\text{ V}$



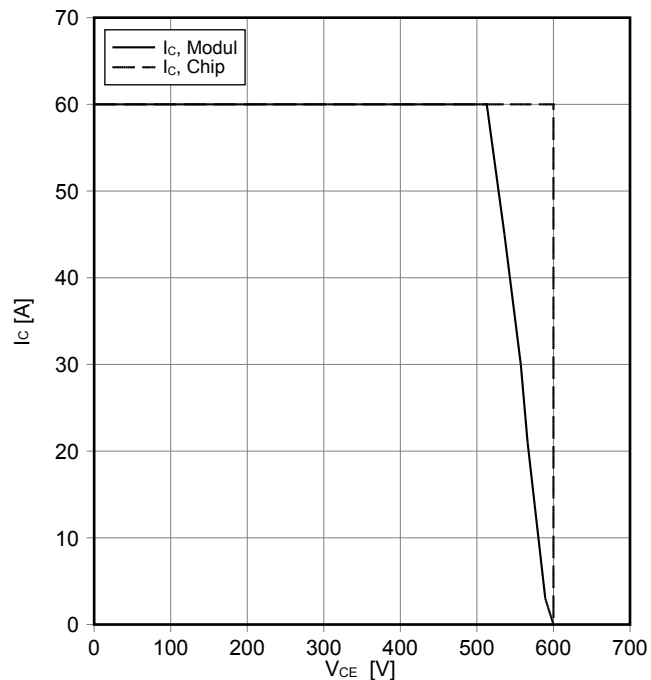
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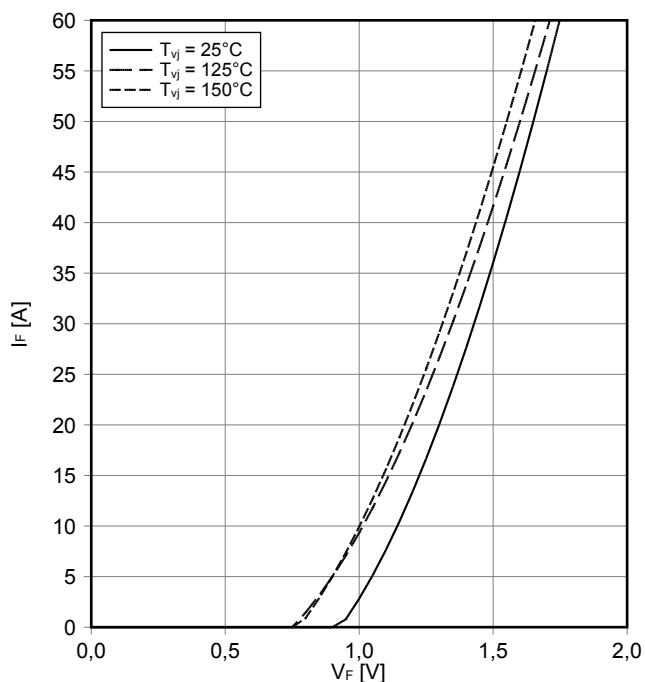
瞬态热阻抗 IGBT, T2 / T3  
transient thermal impedance IGBT, T2 / T3  
 $Z_{thJH} = f(t)$



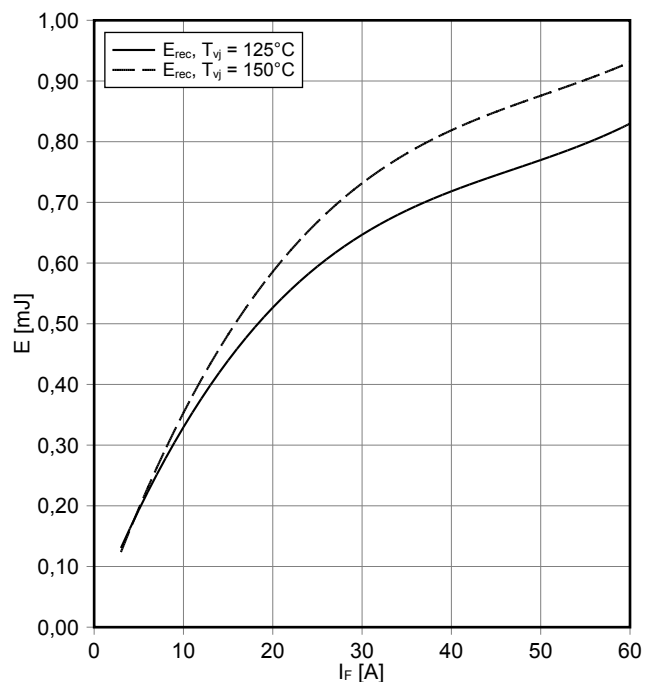
反偏安全工作区 IGBT, T2 / T3 ( RBSOA )  
reverse bias safe operating area IGBT, T2 / T3 (RBSOA)  
 $I_C = f(V_{CE})$   
 $V_{GE} = \pm 15 V, R_{Goff} = 10 \Omega, T_{vj} = 150^\circ C$



正向偏压特性 二极管, D2 / D3 ( 典型 )  
forward characteristic of Diode, D2 / D3 (typical)  
 $I_F = f(V_F)$



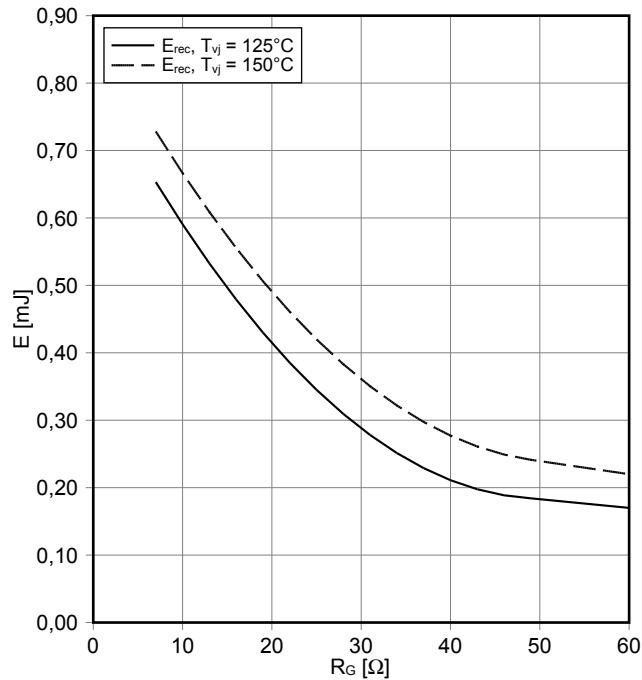
开关损耗 二极管, D2 / D3 ( 典型 )  
switching losses Diode, D2 / D3 (typical)  
 $E_{rec} = f(I_F)$   
 $R_{Gon} = 6.8 \Omega, V_{CE} = 400 V$



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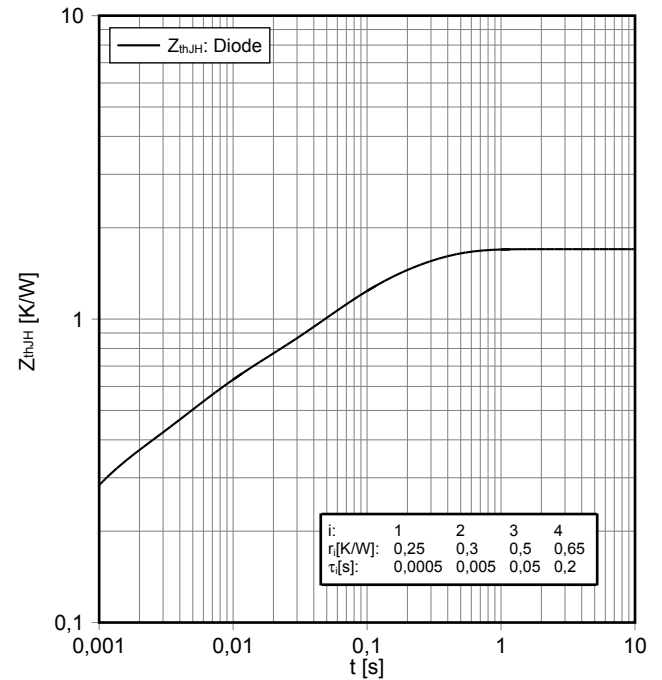
开关损耗 二极管, D2 / D3 (典型)  
switching losses Diode, D2 / D3 (typical)

$E_{rec} = f(R_G)$   
 $I_F = 30\text{ A}, V_{CE} = 400\text{ V}$



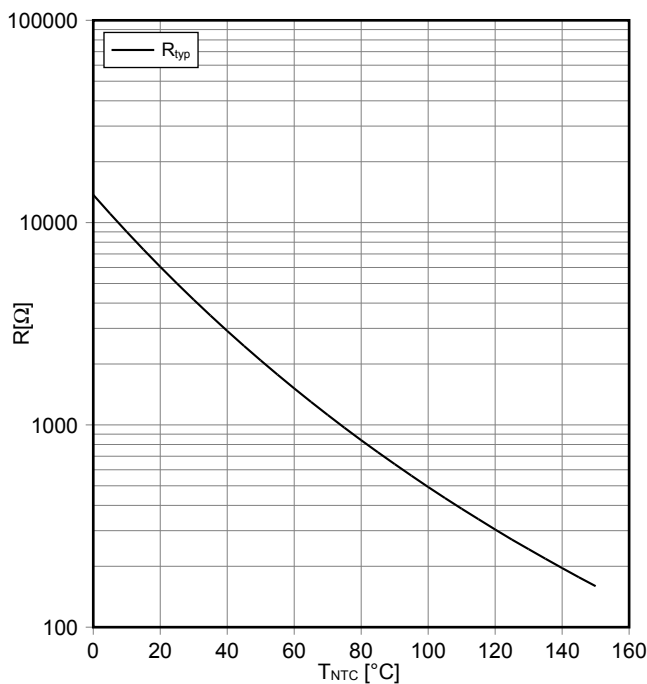
瞬态热阻抗 二极管, D2 / D3  
transient thermal impedance Diode, D2 / D3

$Z_{thJH} = f(t)$



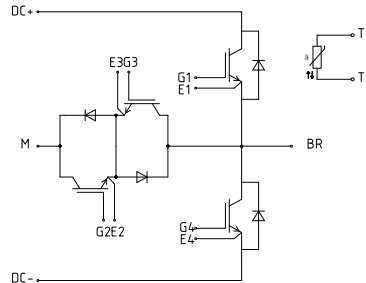
负温度系数热敏电阻 温度特性  
NTC-Thermistor-temperature characteristic (typical)

$R = f(T)$

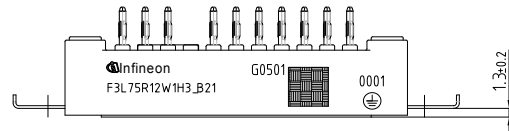
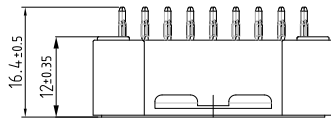


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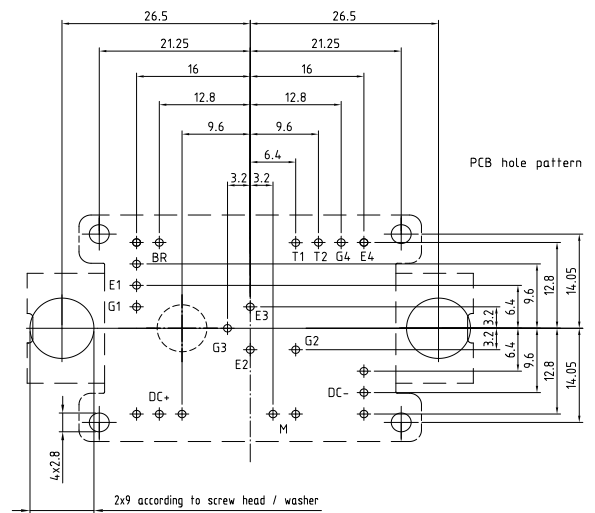
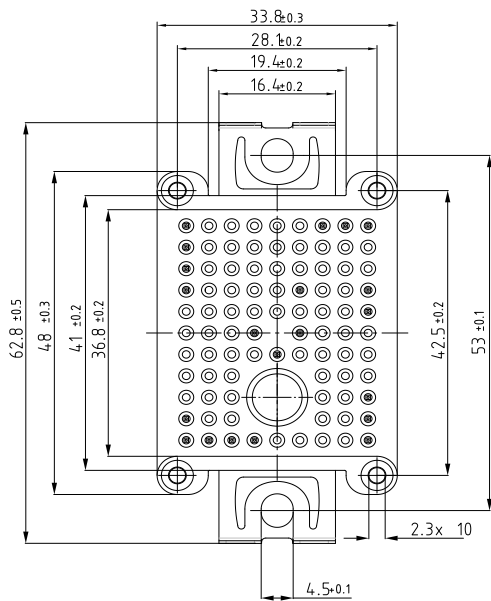
## 接线图 / Circuit diagram



## 封装尺寸 / Package outlines



- Pin-Grid 3.2mm
- Tolerance of PCB hole pattern  $\varnothing 0.1$
- Hole specification for contacts see AN 2009-01
- Diameters of drill  $\varnothing 1.15$ mm  
and copper thickness in hole 25-50 $\mu$ m



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