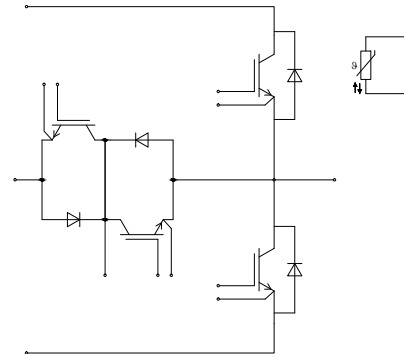
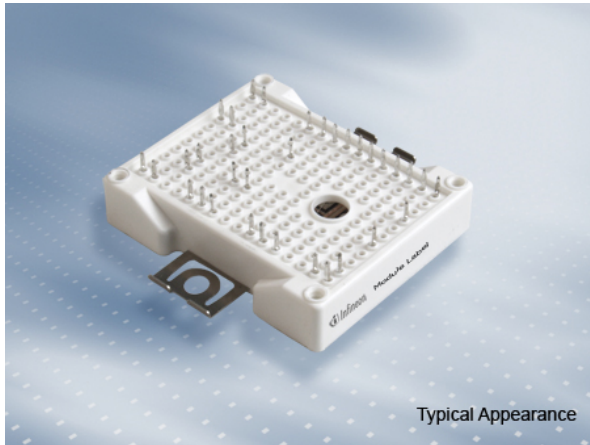


EasyPACK 模块 采用第二类中点钳位拓扑 (NPC2) 带有pressfit压接管脚和温度检测NTC  
EasyPACK module with active "Neutral Point Clamp 2" topology and PressFIT / NTC

初步数据 / Preliminary Data



$V_{CES} = 1200V$   
 $I_{C\ nom} = 50A / I_{CRM} = 100A$

典型应用

- 三电平应用
- 太阳能应用

Typical Applications

- 3-Level-Applications
- Solar Applications

电气特性

- 高速IGBT H3
- 低开关损耗
- $T_{vj\ op} = 150^{\circ}C$

Electrical Features

- High Speed IGBT H3
- Low Switching Losses
- $T_{vj\ op} = 150^{\circ}C$

机械特性

- PressFIT 压接技术
- 符合RoHS

Mechanical Features

- PressFIT Contact Technology
- RoHS compliant

Module Label Code

Barcode Code 128



DMX - Code



Content of the Code

Content of the Code	Digit
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

prepared by: CM	date of publication: 2015-02-03	
approved by: AKDA	revision: 2.3	UL approved (E83335)

初步数据  
Preliminary Data

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		$I_{CN}$	100	A
连续集电极直流电流 Continuous DC collector current	$T_C = 100^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	$I_{C\text{nom}}$	50	A
集电极重复峰值电流 Repetitive peak collector current	$t_P = 1\text{ms}$	$I_{CRM}$	200	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	$P_{\text{tot}}$	375	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	$I_C = 50\text{A}, V_{GE} = 15\text{V}$ $I_C = 50\text{A}, V_{GE} = 15\text{V}$ $I_C = 50\text{A}, V_{GE} = 15\text{V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$V_{CE\text{sat}}$	1,55 1,70 1,75	1,75	V V V
栅极阈值电压 Gate threshold voltage	$I_C = 3,80\text{mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$		$V_{G\text{Eth}}$	5,05	5,80	6,45 V
栅极电荷 Gate charge	$V_{GE} = -15\text{V} \dots +15\text{V}$		$Q_G$	0,80		$\mu\text{C}$
内部栅极电阻 Internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$		$R_{G\text{int}}$	7,5		$\Omega$
输入电容 Input capacitance	$f = 1\text{MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{V}, V_{GE} = 0\text{V}$		$C_{\text{ies}}$	6,15		nF
反向传输电容 Reverse transfer capacitance	$f = 1\text{MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{V}, V_{GE} = 0\text{V}$		$C_{\text{res}}$	0,345		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	$I_C = 50\text{A}, V_{CE} = 400\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{on}} = 1,1\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{d\text{on}}$	0,13 0,14 0,145		$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
上升时间(电感负载) Rise time, inductive load	$I_C = 50\text{A}, V_{CE} = 400\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{on}} = 1,1\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_r$	0,02 0,03 0,03		$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
关断延迟时间(电感负载) Turn-off delay time, inductive load	$I_C = 50\text{A}, V_{CE} = 400\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{off}} = 1,1\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{d\text{off}}$	0,30 0,38 0,40		$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
下降时间(电感负载) Fall time, inductive load	$I_C = 50\text{A}, V_{CE} = 400\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{off}} = 1,1\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_f$	0,03 0,06 0,065		$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
开通损耗能量(每脉冲) Turn-on energy loss per pulse	$I_C = 50\text{A}, V_{CE} = 400\text{V}, L_S = 25\text{nH}$ $V_{GE} = \pm 15\text{V}, di/dt = 2200\text{A}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $R_{G\text{on}} = 1,1\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$E_{\text{on}}$	1,05 1,65 1,80		mJ mJ mJ
关断损耗能量(每脉冲) Turn-off energy loss per pulse	$I_C = 50\text{A}, V_{CE} = 400\text{V}, L_S = 25\text{nH}$ $V_{GE} = \pm 15\text{V}, du/dt = 2400\text{V}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $R_{G\text{off}} = 1,1\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$E_{\text{off}}$	1,60 2,60 2,95		mJ mJ mJ
短路数据 SC data	$V_{GE} \leq 15\text{V}, V_{CC} = 800\text{V}$ $V_{CE\text{max}} = V_{CES} - L_{SCE} \cdot di/dt$ $t_P \leq 10\mu\text{s}, T_{vj} = 150^{\circ}\text{C}$		$I_{SC}$	400		A
结 - 外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		$R_{thJC}$	0,30	0,40	K/W

prepared by: CM	date of publication: 2015-02-03
approved by: AKDA	revision: 2.3



初步数据  
Preliminary Data

外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个 IGBT / per IGBT $\lambda_{\text{Paste}} = 1 \text{ W}/(\text{m}\cdot\text{K})$ / $\lambda_{\text{grease}} = 1 \text{ W}/(\text{m}\cdot\text{K})$	$R_{\text{thCH}}$		0,35		K/W
在开关状态下温度 Temperature under switching conditions		$T_{\text{vj op}}$	-40		150	°C

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	$T_{\text{vj}} = 25^\circ\text{C}$	$V_{\text{RRM}}$		650		V
正向电流 Implemented forward current		$I_{\text{FN}}$		100		A
连续正向直流电流 Continuous DC forward current		$I_{\text{F}}$		50		A
正向重复峰值电流 Repetitive peak forward current	$t_{\text{p}} = 1 \text{ ms}$	$I_{\text{FRM}}$		200		A
$I^2t$ -值 $I^2t$ - value	$V_{\text{R}} = 0 \text{ V}, t_{\text{p}} = 10 \text{ ms}, T_{\text{vj}} = 125^\circ\text{C}$ $V_{\text{R}} = 0 \text{ V}, t_{\text{p}} = 10 \text{ ms}, T_{\text{vj}} = 150^\circ\text{C}$	$I^2t$		850 800		A <sup>2</sup> s A <sup>2</sup> s

特征值 / Characteristic Values

				min.	typ.	max.	
正向电压 Forward voltage	$I_{\text{F}} = 50 \text{ A}, V_{\text{GE}} = 0 \text{ V}$ $I_{\text{F}} = 50 \text{ A}, V_{\text{GE}} = 0 \text{ V}$ $I_{\text{F}} = 50 \text{ A}, V_{\text{GE}} = 0 \text{ V}$	$T_{\text{vj}} = 25^\circ\text{C}$ $T_{\text{vj}} = 125^\circ\text{C}$ $T_{\text{vj}} = 150^\circ\text{C}$	$V_{\text{F}}$		1,35 1,30 1,25	1,60	V V V
反向恢复峰值电流 Peak reverse recovery current	$I_{\text{F}} = 50 \text{ A}, -di_{\text{F}}/dt = 2200 \text{ A}/\mu\text{s} (T_{\text{vj}}=150^\circ\text{C})$ $V_{\text{R}} = 400 \text{ V}$ $V_{\text{GE}} = -15 \text{ V}$	$T_{\text{vj}} = 25^\circ\text{C}$ $T_{\text{vj}} = 125^\circ\text{C}$ $T_{\text{vj}} = 150^\circ\text{C}$	$I_{\text{RM}}$		52,0 57,0 59,0		A A A
恢复电荷 Recovered charge	$I_{\text{F}} = 50 \text{ A}, -di_{\text{F}}/dt = 2200 \text{ A}/\mu\text{s} (T_{\text{vj}}=150^\circ\text{C})$ $V_{\text{R}} = 400 \text{ V}$ $V_{\text{GE}} = -15 \text{ V}$	$T_{\text{vj}} = 25^\circ\text{C}$ $T_{\text{vj}} = 125^\circ\text{C}$ $T_{\text{vj}} = 150^\circ\text{C}$	$Q_{\text{r}}$		1,90 3,60 4,10		$\mu\text{C}$ $\mu\text{C}$ $\mu\text{C}$
反向恢复损耗 (每脉冲) Reverse recovery energy	$I_{\text{F}} = 50 \text{ A}, -di_{\text{F}}/dt = 2200 \text{ A}/\mu\text{s} (T_{\text{vj}}=150^\circ\text{C})$ $V_{\text{R}} = 400 \text{ V}$ $V_{\text{GE}} = -15 \text{ V}$	$T_{\text{vj}} = 25^\circ\text{C}$ $T_{\text{vj}} = 125^\circ\text{C}$ $T_{\text{vj}} = 150^\circ\text{C}$	$E_{\text{rec}}$		0,45 0,75 0,85		mJ mJ mJ
结 - 外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		$R_{\text{thJC}}$		0,55	0,70	K/W
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个二极管 / per diode $\lambda_{\text{Paste}} = 1 \text{ W}/(\text{m}\cdot\text{K})$ / $\lambda_{\text{grease}} = 1 \text{ W}/(\text{m}\cdot\text{K})$		$R_{\text{thCH}}$		0,65		K/W
在开关状态下温度 Temperature under switching conditions			$T_{\text{vj op}}$	-40		150	°C

prepared by: CM	date of publication: 2015-02-03
approved by: AKDA	revision: 2.3

初步数据  
Preliminary Data

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	$T_C = 75^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	$I_{C\text{nom}}$	50	A
集电极重复峰值电流 Repetitive peak collector current	$t_P = 1\text{ms}$	$I_{CRM}$	100	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	$P_{\text{tot}}$	175	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	$I_C = 50\text{A}, V_{GE} = 15\text{V}$ $I_C = 50\text{A}, V_{GE} = 15\text{V}$ $I_C = 50\text{A}, V_{GE} = 15\text{V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$V_{CE\text{sat}}$	1,45 1,60 1,70	1,90	V V V
栅极阈值电压 Gate threshold voltage	$I_C = 0,80\text{mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$		$V_{GEth}$	4,90	5,80	6,50 V
栅极电荷 Gate charge	$V_{GE} = -15\text{V} \dots +15\text{V}$		$Q_G$	0,50		$\mu\text{C}$
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	$f = 1\text{MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{V}, V_{GE} = 0\text{V}$		$C_{ies}$	3,10		nF
反向传输电容 Reverse transfer capacitance	$f = 1\text{MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{V}, V_{GE} = 0\text{V}$		$C_{res}$	0,095		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	$I_C = 50\text{A}, V_{CE} = 400\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{Gon} = 8,2\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{d\text{on}}$	0,025 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	$I_C = 50\text{A}, V_{CE} = 400\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{Gon} = 8,2\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_r$	0,017 0,021 0,022		$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
关断延迟时间(电感负载) Turn-off delay time, inductive load	$I_C = 50\text{A}, V_{CE} = 400\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{Goff} = 8,2\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{d\text{off}}$	0,19 0,22 0,25		$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
下降时间(电感负载) Fall time, inductive load	$I_C = 50\text{A}, V_{CE} = 400\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{Goff} = 8,2\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_f$	0,033 0,05 0,055		$\mu\text{s}$ $\mu\text{s}$ $\mu\text{s}$
开通损耗能量(每脉冲) Turn-on energy loss per pulse	$I_C = 50\text{A}, V_{CE} = 400\text{V}, L_S = 25\text{nH}$ $V_{GE} = \pm 15\text{V}, di/dt = 2600\text{A}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $R_{Gon} = 8,2\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$E_{\text{on}}$	1,10 1,75 1,90		mJ mJ mJ
关断损耗能量(每脉冲) Turn-off energy loss per pulse	$I_C = 50\text{A}, V_{CE} = 400\text{V}, L_S = 25\text{nH}$ $V_{GE} = \pm 15\text{V}, du/dt = 4000\text{V}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $R_{Goff} = 8,2\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$E_{\text{off}}$	1,50 2,05 2,20		mJ mJ mJ
短路数据 SC data	$V_{GE} \leq 15\text{V}, V_{CC} = 360\text{V}$ $V_{CE\text{max}} = V_{CES} - L_{SCE} \cdot di/dt$	$t_P \leq 8\mu\text{s}, T_{vj} = 25^{\circ}\text{C}$ $t_P \leq 6\mu\text{s}, T_{vj} = 150^{\circ}\text{C}$	$I_{SC}$	350 250		A A
结 - 外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		$R_{thJC}$	0,75	0,85	K/W
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个 IGBT / per IGBT $\lambda_{\text{Paste}} = 1\text{W}/(\text{m}\cdot\text{K}) / \lambda_{\text{grease}} = 1\text{W}/(\text{m}\cdot\text{K})$		$R_{thCH}$	0,70		K/W
在开关状态下温度 Temperature under switching conditions			$T_{vj\text{op}}$	-40	150	$^{\circ}\text{C}$

prepared by: CM	date of publication: 2015-02-03
approved by: AKDA	revision: 2.3

初步数据  
Preliminary Data

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	$T_{vj} = 25^{\circ}\text{C}$	$V_{RRM}$	1200	V
连续正向直流电流 Continuous DC forward current		$I_F$	35	A
正向重复峰值电流 Repetitive peak forward current	$t_P = 1\text{ ms}$	$I_{FRM}$	150	A
I <sup>2</sup> t-值 I <sup>2</sup> t - value	$V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$	$I^2t$	510	A <sup>2</sup> s
	$V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$		450	A <sup>2</sup> s

特征值 / Characteristic Values

			min.	typ.	max.	
正向电压 Forward voltage	$I_F = 35\text{ A}, V_{GE} = 0\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$		2,00	2,55	V
	$I_F = 35\text{ A}, V_{GE} = 0\text{ V}$	$T_{vj} = 125^{\circ}\text{C}$		1,70		V
	$I_F = 35\text{ A}, V_{GE} = 0\text{ V}$	$T_{vj} = 150^{\circ}\text{C}$		1,65		V
反向恢复峰值电流 Peak reverse recovery current	$I_F = 35\text{ A}, -di_F/dt = 2400\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 400\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$		70,0		A
		$T_{vj} = 125^{\circ}\text{C}$		85,0		A
		$T_{vj} = 150^{\circ}\text{C}$		90,0		A
恢复电荷 Recovered charge	$I_F = 35\text{ A}, -di_F/dt = 2400\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 400\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$		2,40		$\mu\text{C}$
		$T_{vj} = 125^{\circ}\text{C}$		5,70		$\mu\text{C}$
		$T_{vj} = 150^{\circ}\text{C}$		7,00		$\mu\text{C}$
反向恢复损耗 (每脉冲) Reverse recovery energy	$I_F = 35\text{ A}, -di_F/dt = 2400\text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 400\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$		0,70		mJ
		$T_{vj} = 125^{\circ}\text{C}$		1,75		mJ
		$T_{vj} = 150^{\circ}\text{C}$		2,15		mJ
结 - 外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode	$R_{thJC}$		0,65	0,75	K/W
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个二极管 / per diode $\lambda_{Paste} = 1\text{ W}/(\text{m}\cdot\text{K}) / \lambda_{grease} = 1\text{ W}/(\text{m}\cdot\text{K})$	$R_{thCH}$		0,85		K/W
在开关状态下温度 Temperature under switching conditions		$T_{vj op}$	-40		150	$^{\circ}\text{C}$

模块 / Module

绝缘测试电压 Isolation test voltage	RMS, $f = 50\text{ Hz}, t = 1\text{ min.}$	$V_{ISOL}$	2,5	kV
内部绝缘 Internal isolation	基本绝缘 (class 1, IEC 61140) basic insulation (class 1, IEC 61140)		$\text{Al}_2\text{O}_3$	
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		$L_{sCE}$	14	nH
储存温度 Storage temperature		$T_{stg}$	-40	125 $^{\circ}\text{C}$
Anpresskraft für mech. Bef. pro Feder mounting force per clamp		F	40	- 80 N
重量 Weight		G	39	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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初步数据  
Preliminary Data

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	$T_C = 25^\circ\text{C}$	$R_{25}$		5,00		kΩ
R100 偏差 Deviation of R100	$T_C = 100^\circ\text{C}, R_{100} = 493 \Omega$	$\Delta R/R$	-5		5	%
耗散功率 Power dissipation	$T_C = 25^\circ\text{C}$	$P_{25}$			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.

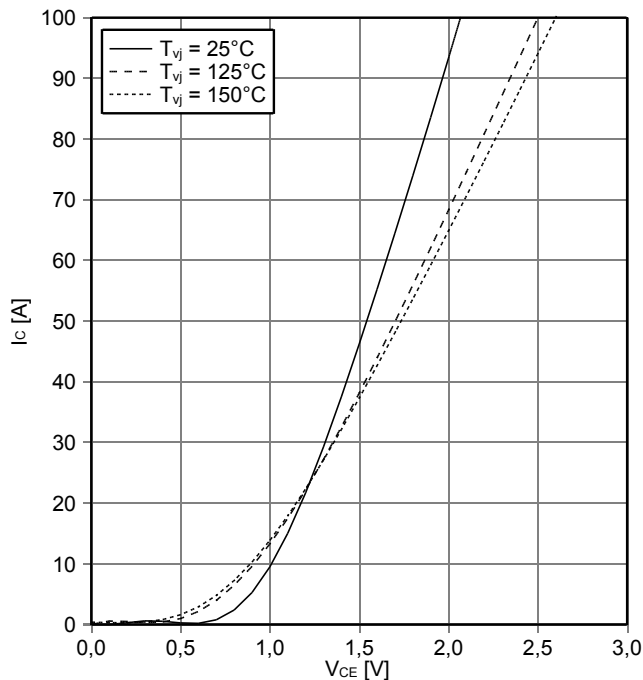
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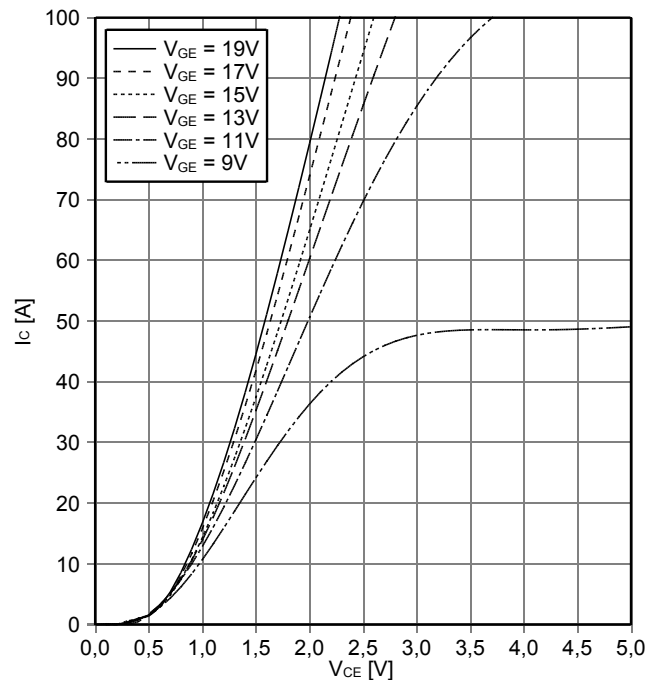
输出特性 IGBT, T1 / T4 (典型)  
output characteristic IGBT, T1 / T4 (typical)

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



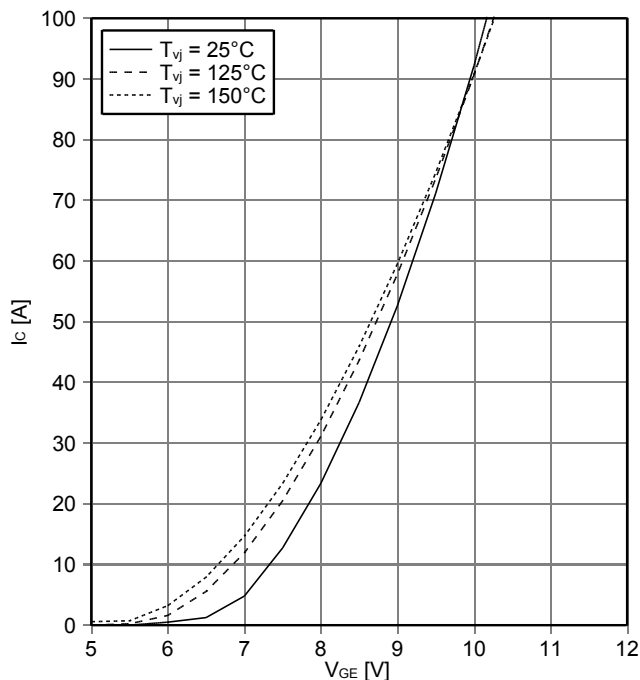
输出特性 IGBT, T1 / T4 (典型)  
output characteristic IGBT, T1 / T4 (typical)

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



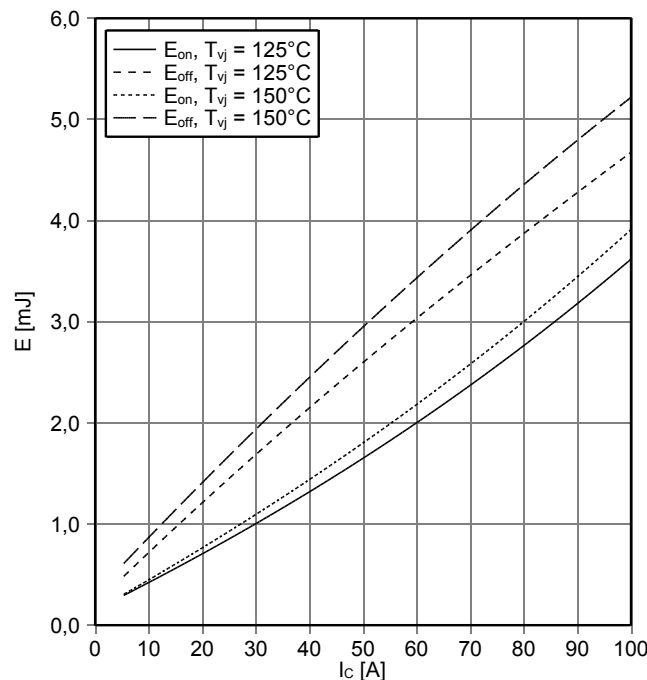
传输特性 IGBT, T1 / T4 (典型)  
transfer characteristic IGBT, T1 / T4 (typical)

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



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

$E_{on} = f(I_C), E_{off} = f(I_C)$   
 $V_{GE} = \pm 15\text{ V}, R_{Gon} = 1.1\ \Omega, R_{Goff} = 1.1\ \Omega, V_{CE} = 400\text{ V}$



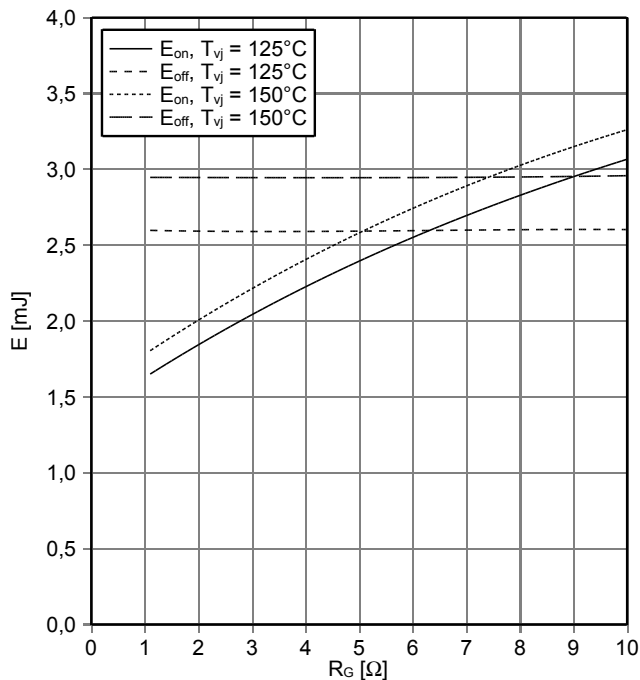
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初步数据  
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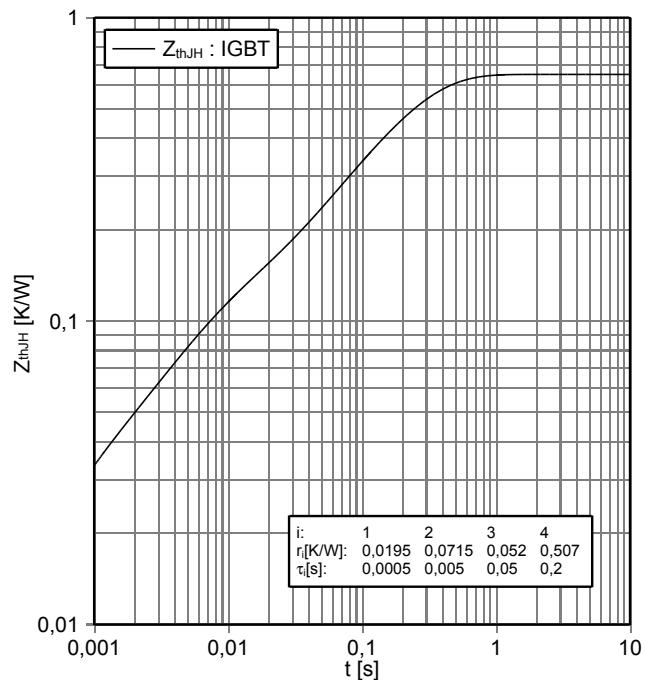
开关损耗 IGBT, T1 / T4 (典型)  
switching losses IGBT, T1 / T4 (typical)

$E_{on} = f(R_G)$ ,  $E_{off} = f(R_G)$   
 $V_{GE} = \pm 15\text{ V}$ ,  $I_C = 50\text{ A}$ ,  $V_{CE} = 400\text{ V}$



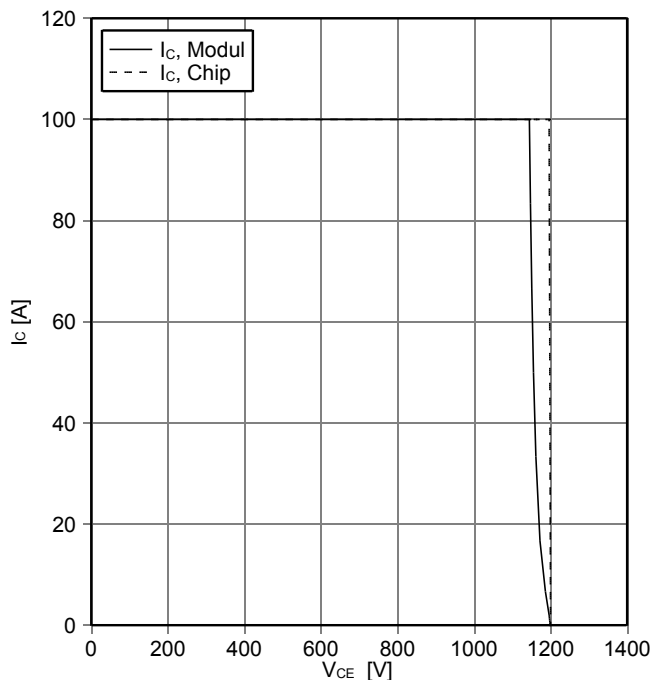
瞬态热阻抗 IGBT, T1 / T4  
transient thermal impedance IGBT, T1 / T4

$Z_{thJH} = f(t)$



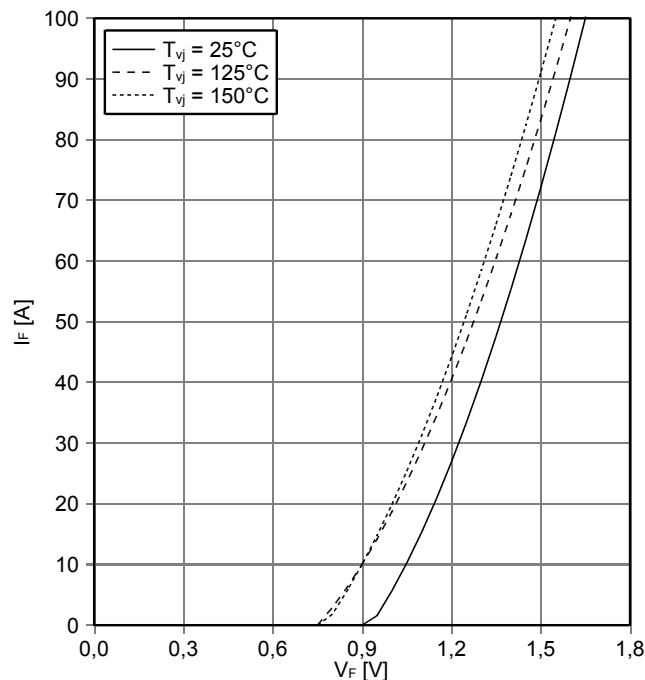
反偏安全工作区 IGBT, T1 / T4 (RBSOA)  
reverse bias safe operating area IGBT, T1 / T4 (RBSOA)

$I_C = f(V_{CE})$   
 $V_{GE} = \pm 15\text{ V}$ ,  $R_{Goff} = 1.1\ \Omega$ ,  $T_{vj} = 150^\circ\text{C}$



正向偏压特性 二极管, D2 / D3 (典型)  
forward characteristic of Diode, D2 / D3 (typical)

$I_F = f(V_F)$



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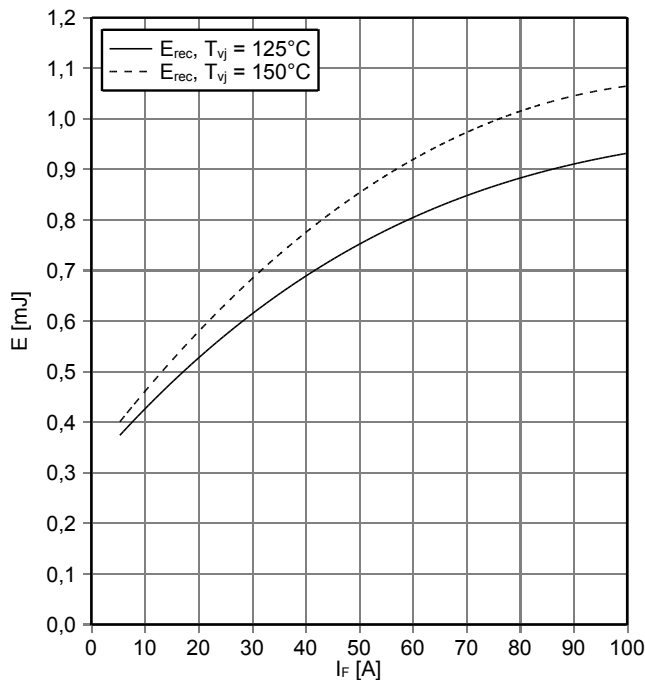




初步数据  
Preliminary Data

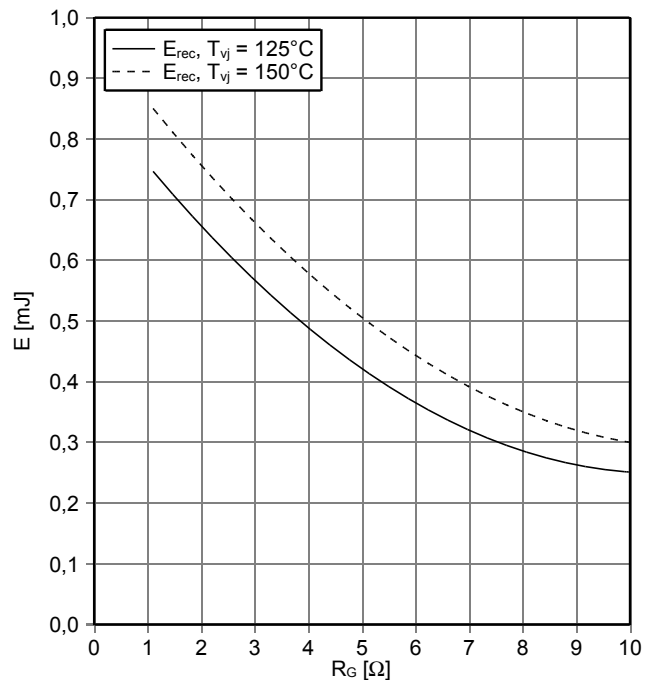
开关损耗 二极管, D2 / D3 (典型)  
switching losses Diode, D2 / D3 (typical)

$E_{rec} = f(I_F)$   
 $R_{Gon} = 1.1 \Omega, V_{CE} = 400 V$



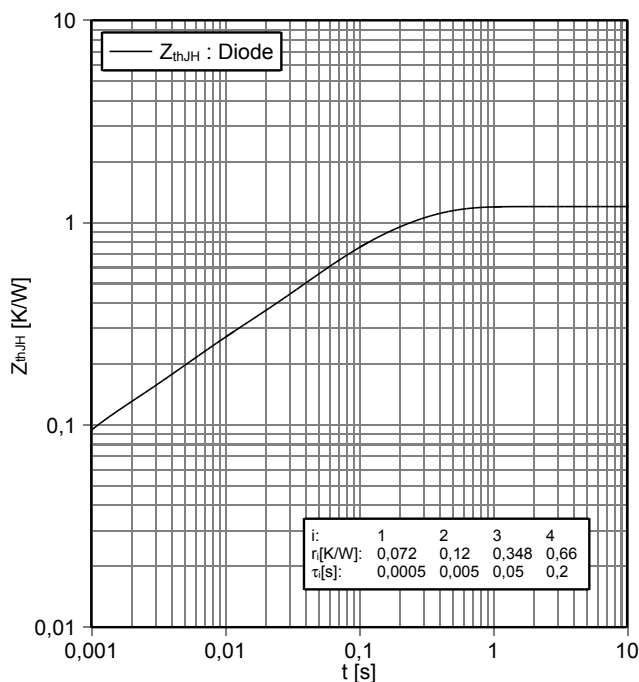
开关损耗 二极管, D2 / D3 (典型)  
switching losses Diode, D2 / D3 (typical)

$E_{rec} = f(R_G)$   
 $I_F = 50 A, V_{CE} = 400 V$



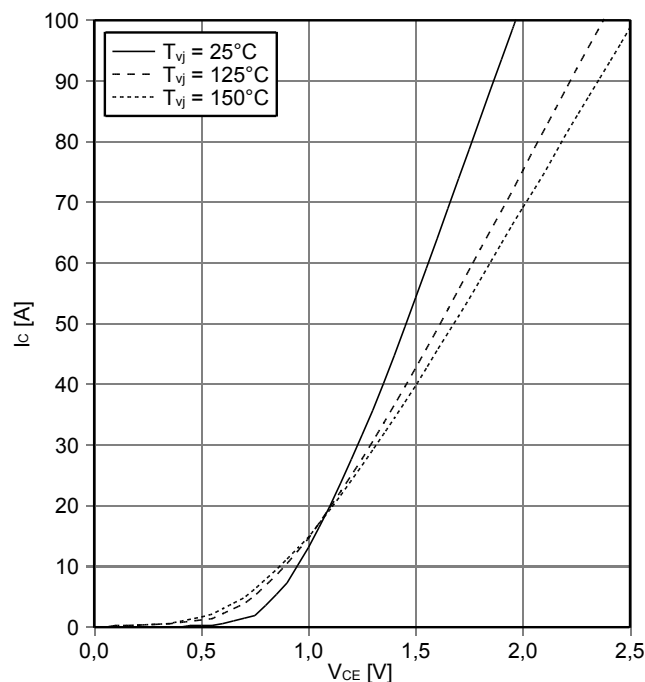
瞬态热阻抗 二极管, D2 / D3  
transient thermal impedance Diode, D2 / D3

$Z_{thJH} = f(t)$



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

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



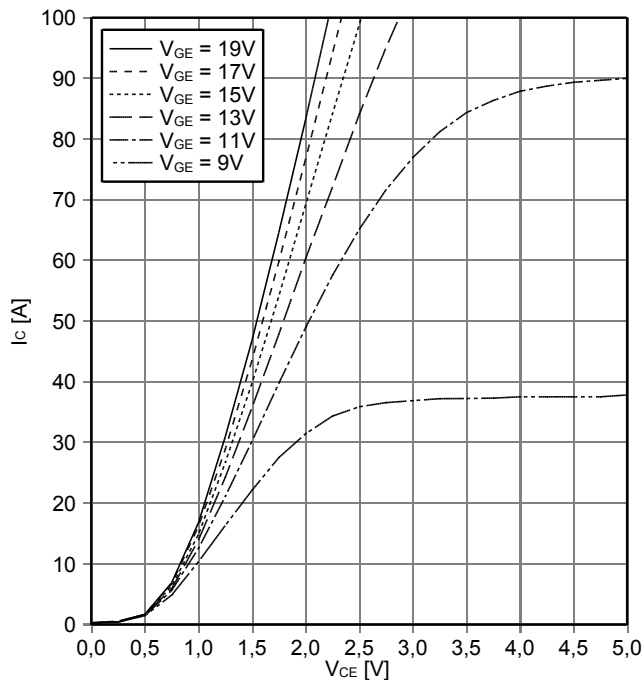
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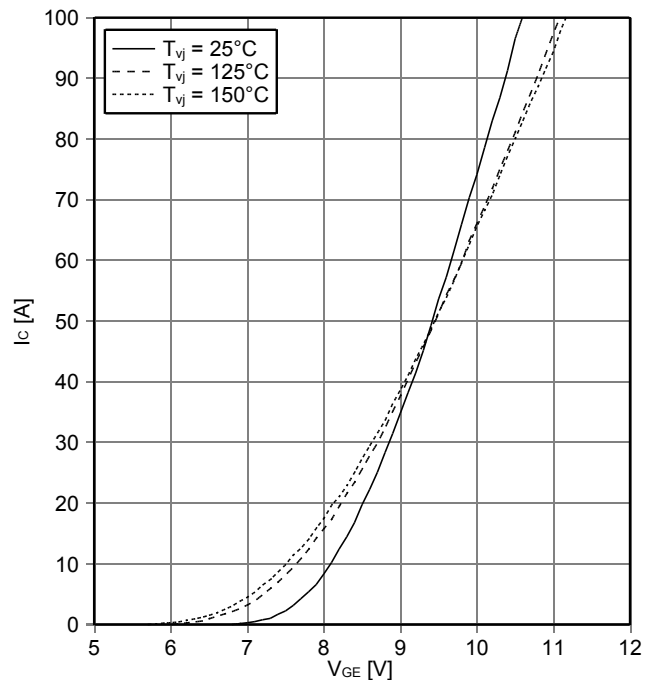
输出特性 IGBT, T2 / T3 (典型)  
output characteristic IGBT, T2 / T3 (typical)

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



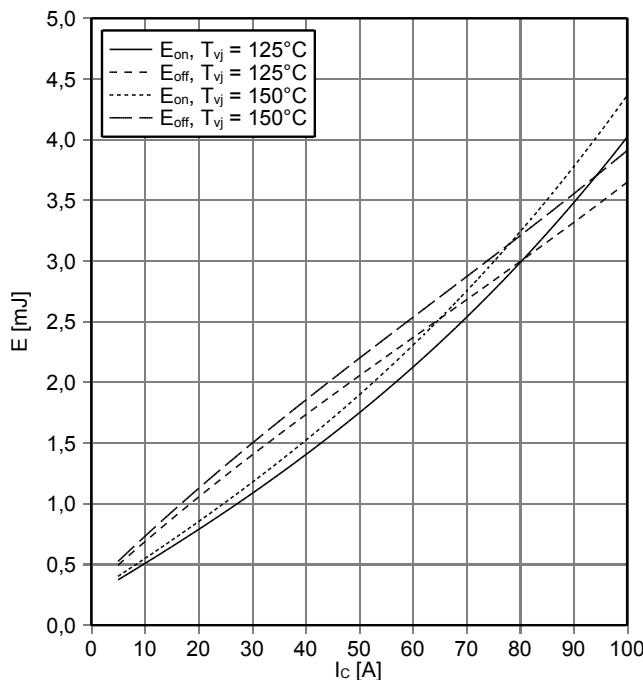
传输特性 IGBT, T2 / T3 (典型)  
transfer characteristic IGBT, T2 / T3 (typical)

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



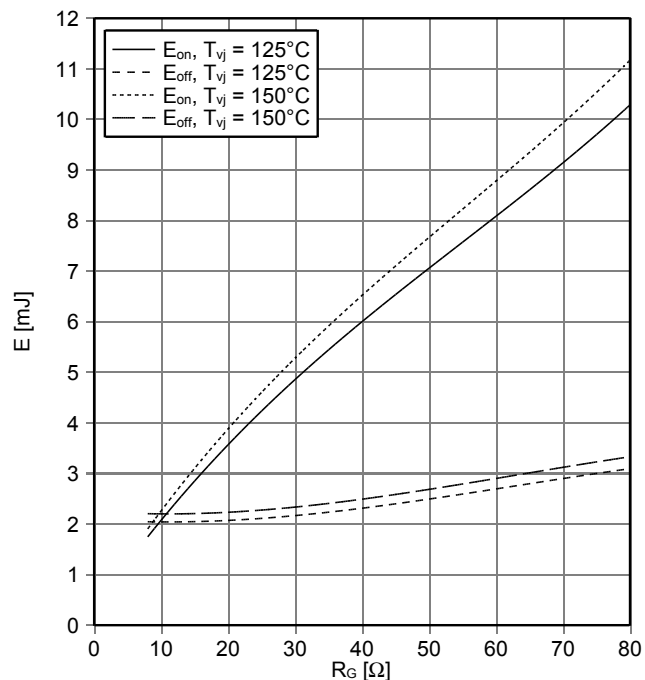
开关损耗 IGBT, T2 / T3 (典型)  
switching losses IGBT, T2 / T3 (typical)

$E_{on} = f(I_C), E_{off} = f(I_C)$   
 $V_{GE} = \pm 15\text{ V}, R_{Gon} = 8.2\ \Omega, R_{Goff} = 8.2\ \Omega, V_{CE} = 400\text{ V}$



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

$E_{on} = f(R_G), E_{off} = f(R_G)$   
 $V_{GE} = \pm 15\text{ V}, I_C = 50\text{ A}, V_{CE} = 400\text{ V}$

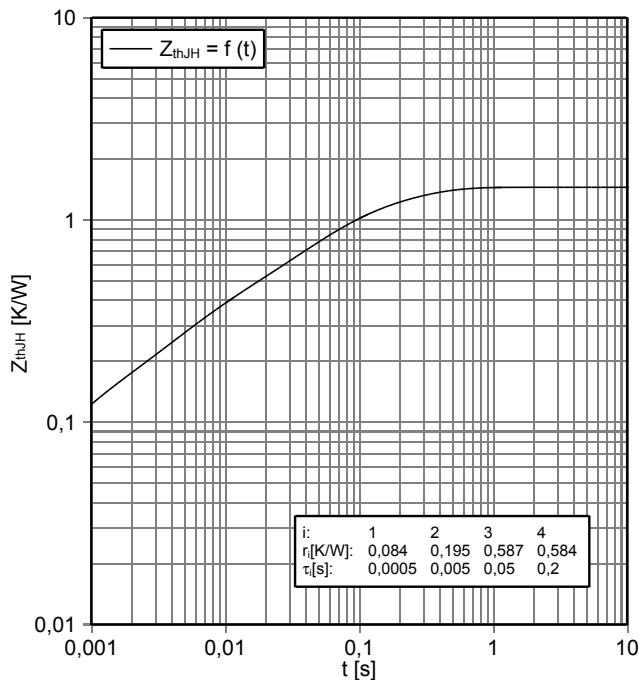


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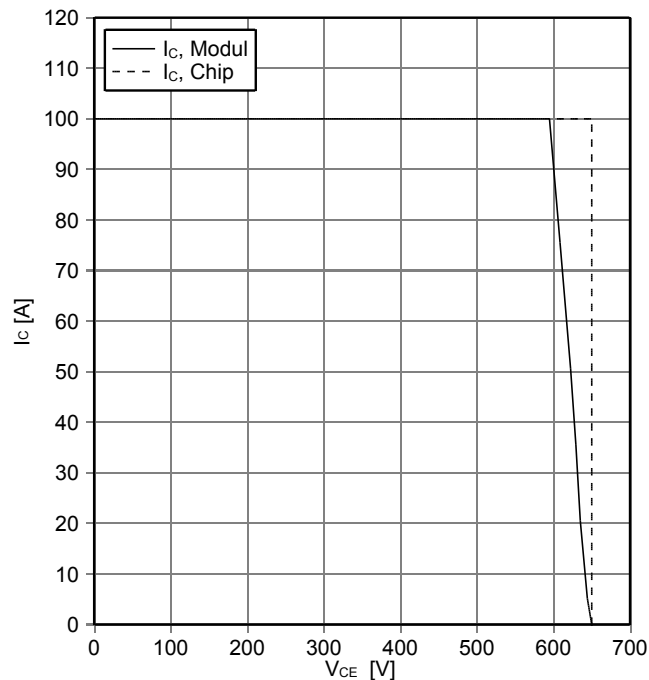


初步数据  
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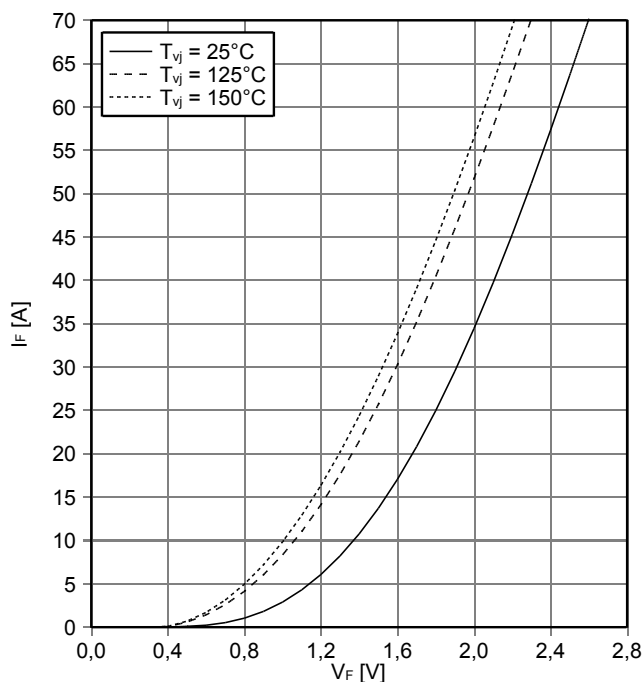
瞬态热阻抗 IGBT, T2 / T3  
transient thermal impedance IGBT, T2 / T3  
 $Z_{thJH} = f(t)$



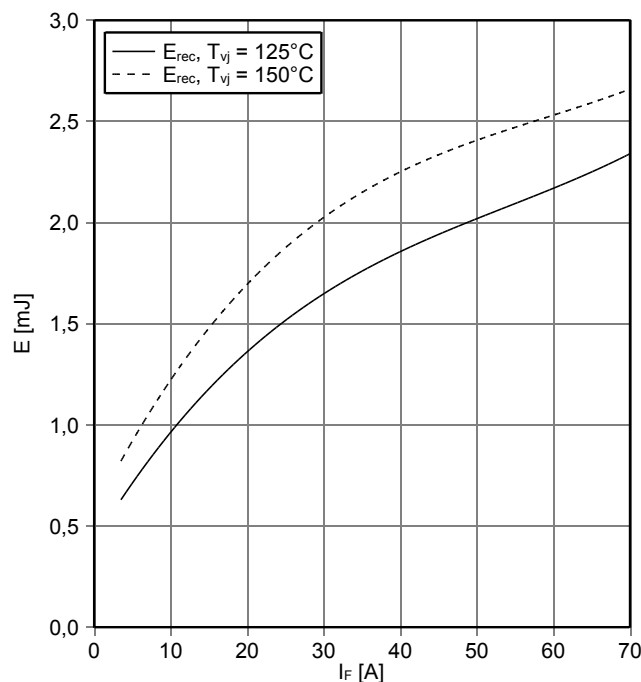
反偏安全工作区 IGBT, T2 / T3 ( RBSOA )  
reverse bias safe operating area IGBT, T2 / T3 (RBSOA)  
 $I_C = f(V_{CE})$   
 $V_{GE} = \pm 15 V, R_{Goff} = 8.2 \Omega, T_{vj} = 150^\circ C$



正向偏压特性 二极管, D1 / D4 ( 典型 )  
forward characteristic of Diode, D1 / D4 (typical)  
 $I_F = f(V_F)$



开关损耗 二极管, D1 / D4 ( 典型 )  
switching losses Diode, D1 / D4 (typical)  
 $E_{rec} = f(I_F)$   
 $R_{Gon} = 8.2 \Omega, V_{CE} = 400 V$

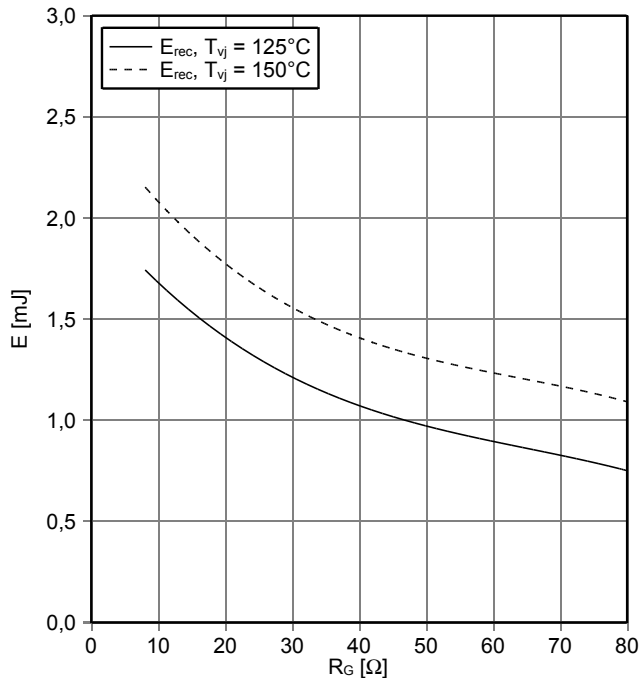


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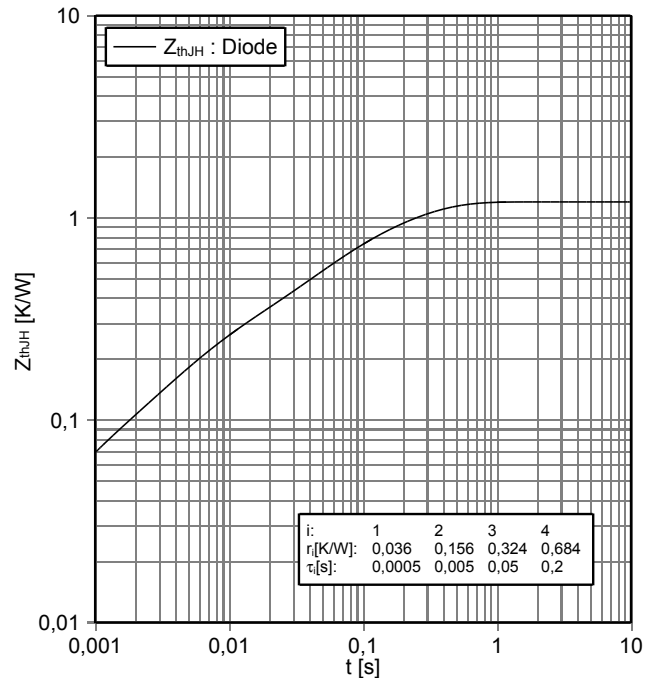
开关损耗 二极管, D1 / D4 (典型)  
switching losses Diode, D1 / D4 (typical)

$E_{rec} = f(R_G)$   
 $I_F = 35\text{ A}, V_{CE} = 400\text{ V}$



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

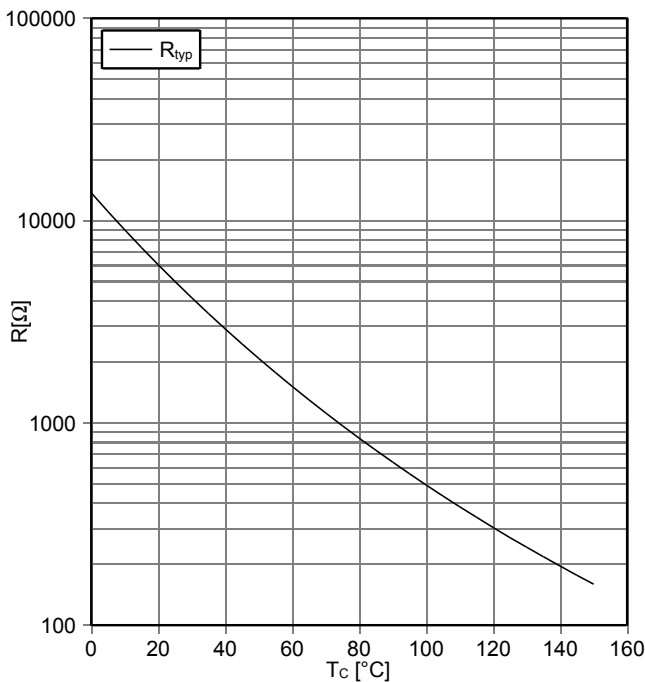
$Z_{thJH} = f(t)$



i:	1	2	3	4
r[K/W]:	0,036	0,156	0,324	0,684
τ[s]:	0,0005	0,005	0,05	0,2

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

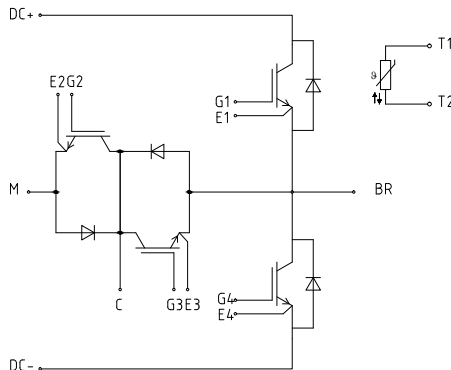
$R = f(T)$



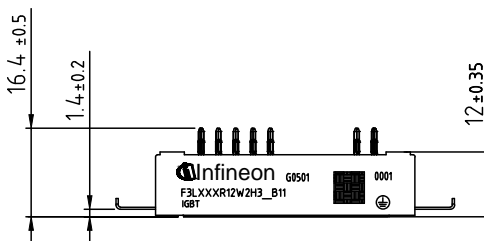
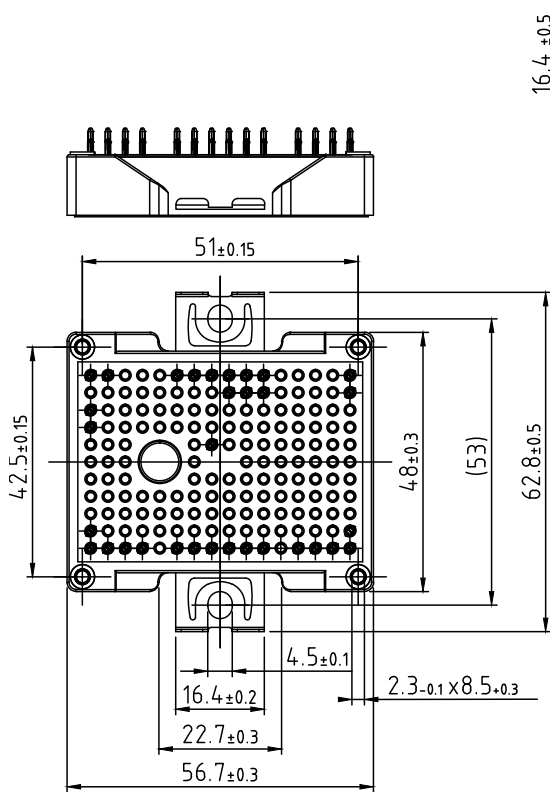
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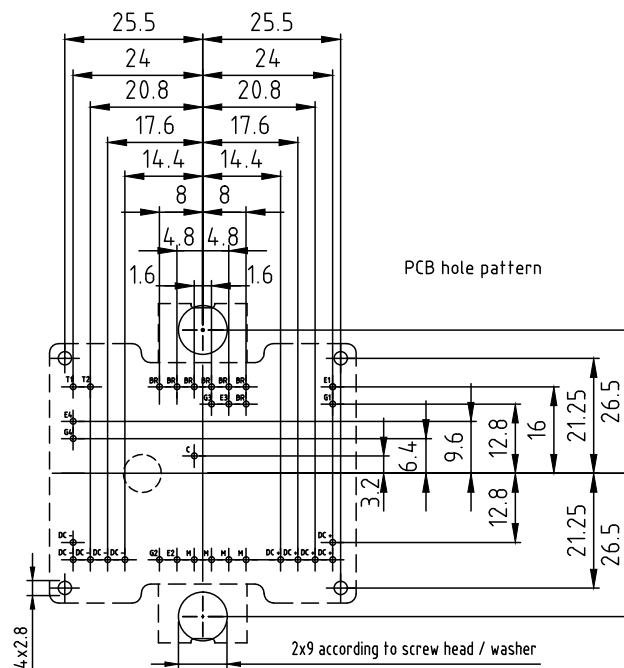
接线图 / circuit\_diagram\_headline



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  $\varnothing 1.15\text{mm}$   
and copper thickness in hole 25-50 $\mu\text{m}$



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**初步数据  
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**使用条件和条款**

**使用条件和条款**

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-建立联合的测试和出厂产品检查，我们可以根据测试的实际情况供货

如果有必要，请根据实际需要将类似的说明给你的客户

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- to perform joint Risk and Quality Assessments;

- the conclusion of Quality Agreements;

- to establish joint measures of an ongoing product survey, and that we may make delivery depended on the realization of any such measures.

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