

EconoPIM™3 Modul mit schnellem Trench/Feldstop IGBT3 und High Efficiency Diode
EconoPIM™3 module with fast trench/fieldstop IGBT3 and Emitter Controlled High Efficiency diode

IGBT, 逆变器 / IGBT, Inverter

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
连续集电极直流电流 Continuous DC collector current	$T_C = 80^{\circ}\text{C}, T_{vj\max} = 150^{\circ}\text{C}$ $T_C = 25^{\circ}\text{C}, T_{vj\max} = 150^{\circ}\text{C}$	$I_{C\text{nom}}$ I_C	75 105	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	$T_C = 25^{\circ}\text{C}, T_{vj\max} = 150$	P_{tot}	355	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	$I_C = 75\text{A}, V_{GE} = 15\text{V}$ $I_C = 75\text{A}, V_{GE} = 15\text{V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$V_{CE\text{sat}}$	1,70 1,90	2,15	V V
栅极阈值电压 Gate threshold voltage	$I_C = 3,00\text{mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$		$V_{G\text{Eth}}$	5,0	5,8	6,5 V
栅极电荷 Gate charge	$V_{GE} = -15\text{V} \dots +15\text{V}$		Q_G	0,70		μC
内部栅极电阻 Internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$		$R_{G\text{int}}$	10		Ω
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}	5,30		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}	0,20		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}		400	nA
开通延迟时间(电感负载) Turn-on delay time, inductive load	$I_C = 75\text{A}, V_{CE} = 600\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{on}} = 4,7\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d\text{on}}$	0,26 0,29		μs μs
上升时间(电感负载) Rise time, inductive load	$I_C = 75\text{A}, V_{CE} = 600\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{on}} = 4,7\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	t_r	0,03 0,05		μs μs
关断延迟时间(电感负载) Turn-off delay time, inductive load	$I_C = 75\text{A}, V_{CE} = 600\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{off}} = 4,7\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d\text{off}}$	0,42 0,52		μs μs
下降时间(电感负载) Fall time, inductive load	$I_C = 75\text{A}, V_{CE} = 600\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{off}} = 4,7\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	t_f	0,07 0,09		μs μs
开通损耗能量(每脉冲) Turn-on energy loss per pulse	$I_C = 75\text{A}, V_{CE} = 600\text{V}, L_S = 45\text{nH}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{on}} = 4,7\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{on}	6,55 9,40		mJ mJ
关断损耗能量(每脉冲) Turn-off energy loss per pulse	$I_C = 75\text{A}, V_{CE} = 600\text{V}, L_S = 45\text{nH}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{off}} = 4,7\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{off}	6,80 8,00		mJ mJ
短路数据 SC data	$V_{GE} \leq 15\text{V}, V_{CC} = 900\text{V}$ $V_{CE\text{max}} = V_{CES} - L_{S\text{CE}} \cdot di/dt$	$t_P \leq 10\mu\text{s}, T_{vj} = 125^{\circ}\text{C}$	I_{SC}	300		A
结 - 外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		R_{thJC}		0,35	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}	0,125		K/W
在开关状态下温度 Temperature under switching conditions			$T_{vj\text{op}}$	-40	125	$^{\circ}\text{C}$

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二极管, 逆变器 / Diode, Inverter
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	75	A
正向重复峰值电流 Repetitive peak forward current	$t_P = 1\text{ ms}$	I_{FRM}	150	A
I ² t-值 I ² t - value	$V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$	I^2t	1200	A ² s

特征值 / Characteristic Values

			min.	typ.	max.	
正向电压 Forward voltage	$I_F = 75\text{ A}, V_{GE} = 0\text{ V}$ $I_F = 75\text{ A}, V_{GE} = 0\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	V_F	1,65 1,65	2,15	V V
反向恢复峰值电流 Peak reverse recovery current	$I_F = 75\text{ A}, -di_F/dt = 2000\text{ A}/\mu\text{s} (T_{vj}=125^{\circ}\text{C})$ $V_R = 600\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	I_{RM}	80,0 86,0		A A
恢复电荷 Recovered charge	$I_F = 75\text{ A}, -di_F/dt = 2000\text{ A}/\mu\text{s} (T_{vj}=125^{\circ}\text{C})$ $V_R = 600\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	Q_r	9,30 16,5		μC μC
反向恢复损耗 (每脉冲) Reverse recovery energy	$I_F = 75\text{ A}, -di_F/dt = 2000\text{ A}/\mu\text{s} (T_{vj}=125^{\circ}\text{C})$ $V_R = 600\text{ V}$ $V_{GE} = -15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{rec}	3,20 6,50		mJ mJ
结 - 外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		R_{thJC}		0,58	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}	0,205		K/W
在开关状态下温度 Temperature under switching conditions			$T_{vj\text{ op}}$	-40	125	$^{\circ}\text{C}$

二极管, 整流器 / Diode, Rectifier
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}	1600	V
最大正向均方根电流(每芯片) Maximum RMS forward current per chip	$T_C = 80^{\circ}\text{C}$	I_{FRMSM}	80	A
最大整流器输出均方根电流 Maximum RMS current at rectifier output	$T_C = 80^{\circ}\text{C}$	I_{RMSM}	115	A
正向浪涌电流 Surge forward current	$t_P = 10\text{ ms}, T_{vj} = 25^{\circ}\text{C}$ $t_P = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$	I_{FSM}	500 400	A A
I ² t-值 I ² t - value	$t_P = 10\text{ ms}, T_{vj} = 25^{\circ}\text{C}$ $t_P = 10\text{ ms}, T_{vj} = 150^{\circ}\text{C}$	I^2t	1250 800	A ² s A ² s

特征值 / Characteristic Values

			min.	typ.	max.	
正向电压 Forward voltage	$T_{vj} = 150^{\circ}\text{C}, I_F = 75\text{ A}$	V_F		1,10		V
反向电流 Reverse current	$T_{vj} = 150^{\circ}\text{C}, V_R = 1600\text{ V}$	I_R		3,00		mA
结 - 外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode	R_{thJC}			0,65	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}		0,23		K/W
在开关状态下温度 Temperature under switching conditions		$T_{vj\text{ op}}$				$^{\circ}\text{C}$

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IGBT, 制动-斩波器 / IGBT, Brake-Chopper
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
连续集电极直流电流 Continuous DC collector current	$T_C = 80^{\circ}\text{C}, T_{vj\text{max}} = 150^{\circ}\text{C}$ $T_C = 25^{\circ}\text{C}, T_{vj\text{max}} = 150^{\circ}\text{C}$	$I_{C\text{nom}}$ I_C	40 55	A A
集电极重复峰值电流 Repetitive peak collector current	$t_P = 1\text{ms}$	I_{CRM}	80	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}\text{C}, T_{vj\text{max}} = 150$	P_{tot}	210	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	$I_C = 40\text{A}, V_{GE} = 15\text{V}$ $I_C = 40\text{A}, V_{GE} = 15\text{V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$V_{CE\text{sat}}$	1,80 2,05	2,30	V V	
栅极阈值电压 Gate threshold voltage	$I_C = 1,50\text{mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$		$V_{G\text{Eth}}$	5,0	5,8	6,5	V
栅极电荷 Gate charge	$V_{GE} = -15\text{V} \dots +15\text{V}$		Q_G	0,33		μC	
内部栅极电阻 Internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$		$R_{G\text{int}}$	6,0		Ω	
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}	2,50		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}	0,09		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}		400	nA	
开通延迟时间(电感负载) Turn-on delay time, inductive load	$I_C = 40\text{A}, V_{CE} = 600\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{on}} = 27\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d\text{on}}$	0,09 0,09		μs μs	
上升时间(电感负载) Rise time, inductive load	$I_C = 40\text{A}, V_{CE} = 600\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{on}} = 27\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	t_r	0,03 0,05		μs μs	
关断延迟时间(电感负载) Turn-off delay time, inductive load	$I_C = 40\text{A}, V_{CE} = 600\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{off}} = 27\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	$t_{d\text{off}}$	0,42 0,52		μs μs	
下降时间(电感负载) Fall time, inductive load	$I_C = 40\text{A}, V_{CE} = 600\text{V}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{off}} = 27\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	t_f	0,07 0,09		μs μs	
开通损耗能量(每脉冲) Turn-on energy loss per pulse	$I_C = 40\text{A}, V_{CE} = 600\text{V}, L_S = \text{t.b.d. nH}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{on}} = 27\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{on}	4,10 6,00		mJ mJ	
关断损耗能量(每脉冲) Turn-off energy loss per pulse	$I_C = 40\text{A}, V_{CE} = 600\text{V}, L_S = \text{t.b.d. nH}$ $V_{GE} = \pm 15\text{V}$ $R_{G\text{off}} = 27\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{off}	3,10 3,55		mJ mJ	
短路数据 SC data	$V_{GE} \leq 15\text{V}, V_{CC} = 900\text{V}$ $V_{CE\text{max}} = V_{CES} - L_{S\text{CE}} \cdot di/dt$	$t_P \leq 10\mu\text{s}, T_{vj} = 125^{\circ}\text{C}$	I_{SC}	160		A	
结 - 外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		$R_{th\text{JC}}$		0,60	K/W	
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个 IGBT / per IGBT $\lambda_{\text{Paste}} = 1\text{W}/(\text{m}\cdot\text{K}) / \lambda_{\text{grease}} = 1\text{W}/(\text{m}\cdot\text{K})$		$R_{th\text{CH}}$	0,21		K/W	
在开关状态下温度 Temperature under switching conditions			$T_{vj\text{op}}$	-40	125	$^{\circ}\text{C}$	

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二极管，制动-斩波器 / Diode, Brake-Chopper
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	25	A
正向重复峰值电流 Repetitive peak forward current	$t_P = 1\text{ ms}$	I_{FRM}	50	A
I ² t-值 I ² t - value	$V_R = 0\text{ V}, t_P = 10\text{ ms}, T_{vj} = 125^{\circ}\text{C}$	I^2t	170	A ² s

特征值 / Characteristic Values

			min.	typ.	max.	
正向电压 Forward voltage	$I_F = 25\text{ A}, V_{GE} = 0\text{ V}$ $I_F = 25\text{ A}, V_{GE} = 0\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	V_F	1,65 1,65	2,20	V V
反向恢复峰值电流 Peak reverse recovery current	$I_F = 25\text{ A}, -di_F/dt = 700\text{ A}/\mu\text{s} (T_{vj}=125^{\circ}\text{C})$ $V_R = 600\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	I_{RM}	26,0 24,0		A A
恢复电荷 Recovered charge	$I_F = 25\text{ A}, -di_F/dt = 700\text{ A}/\mu\text{s} (T_{vj}=125^{\circ}\text{C})$ $V_R = 600\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	Q_r	2,80 5,00		μC μC
反向恢复损耗 (每脉冲) Reverse recovery energy	$I_F = 25\text{ A}, -di_F/dt = 700\text{ A}/\mu\text{s} (T_{vj}=125^{\circ}\text{C})$ $V_R = 600\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	E_{rec}	0,90 1,80		mJ mJ
结 - 外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		R_{thJC}		1,20	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_{thCH}	0,425		K/W
在开关状态下温度 Temperature under switching conditions			$T_{vj\text{ op}}$	-40	125	$^{\circ}\text{C}$

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	$T_C = 25^{\circ}\text{C}$		R_{25}	5,00		k Ω
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	$R_2 = R_{25} \exp [B_{25/80}(1/T_2 - 1/(298,15\text{ K}))]$		$B_{25/80}$	t.b.d.		K
B-值 B-value	$R_2 = R_{25} \exp [B_{25/100}(1/T_2 - 1/(298,15\text{ K}))]$		$B_{25/100}$	t.b.d.		K

根据应用手册标定

Specification according to the valid application note.

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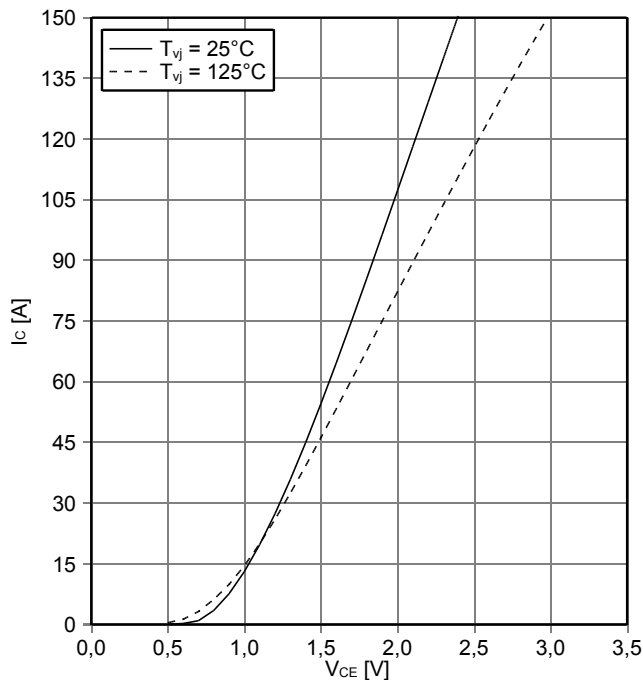
模块 / Module

绝缘测试电压 Isolation test voltage	RMS, f = 50 Hz, t = 1 min.	V _{ISOL}	2,5		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 ₂ O ₃		
爬电距离 Creepage distance	端子- 散热片 / terminal to heatsink 端子- 端子 / terminal to terminal		10,0		mm
电气间隙 Clearance	端子- 散热片 / terminal to heatsink 端子- 端子 / terminal to terminal		7,5		mm
相对电痕指数 Comperative tracking index		CTI	> 225		
min. typ. max.					
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个模块 / per module $\lambda_{\text{Paste}} = 1 \text{ W/(m}\cdot\text{K)} / \lambda_{\text{grease}} = 1 \text{ W/(m}\cdot\text{K)}$	R _{thCH}	0,009		K/W
杂散电感,模块 Stray inductance module		L _{sCE}	60		nH
模块引线电阻,端子-芯片 Module lead resistance, terminals - chip	T _C = 25°C, 每个开关 / per switch	R _{CC'+EE'} R _{AA'+CC'}	4,00 2,00		mΩ
储存温度 Storage temperature		T _{stg}	-40	125	°C
模块安装的安装扭矩 Mounting torque for modul mounting	螺丝 M5 根据相应的应用手册进行安装 Screw M5 - Mounting according to valid application note	M	3,00	-	6,00 Nm
重量 Weight		G	300		g

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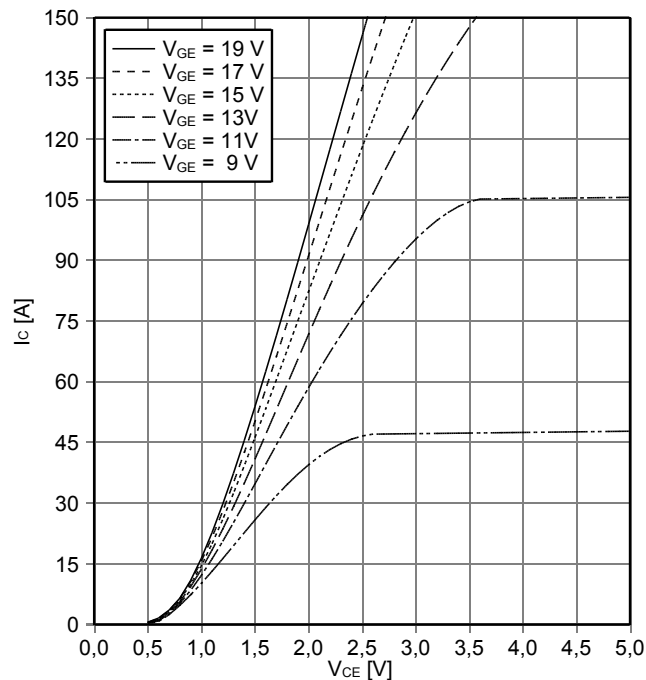
输出特性 IGBT, 逆变器 (典型)
output characteristic IGBT, Inverter (typical)

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



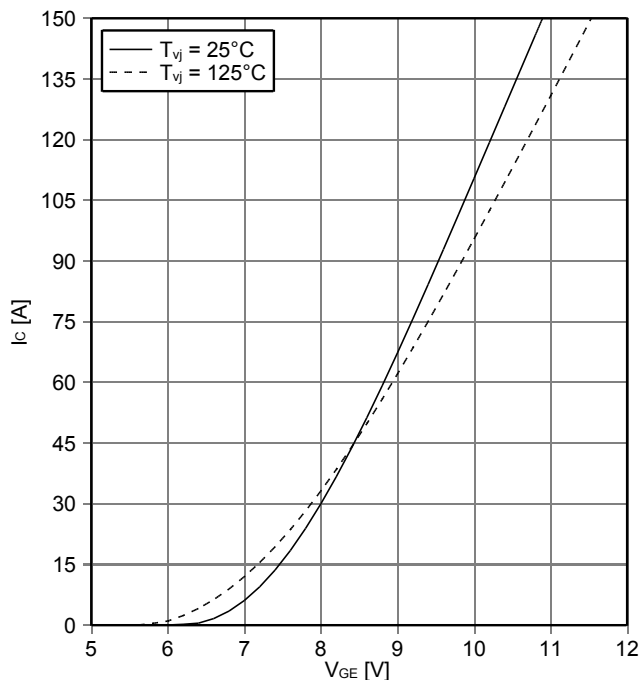
输出特性 IGBT, 逆变器 (典型)
output characteristic IGBT, Inverter (typical)

$I_C = f(V_{CE})$
 $T_{vj} = 125^\circ\text{C}$



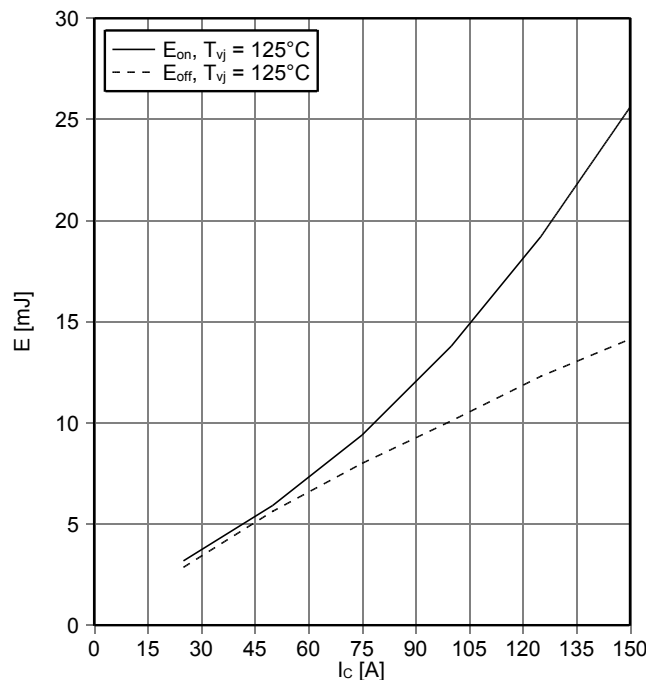
传输特性 IGBT, 逆变器 (典型)
transfer characteristic IGBT, Inverter (typical)

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



开关损耗 IGBT, 逆变器 (典型)
switching losses IGBT, Inverter (typical)

$E_{on} = f(I_C), E_{off} = f(I_C)$
 $V_{GE} = \pm 15\text{ V}, R_{Gon} = 4.7\ \Omega, R_{Goff} = 4.7\ \Omega, V_{CE} = 600\text{ V}$

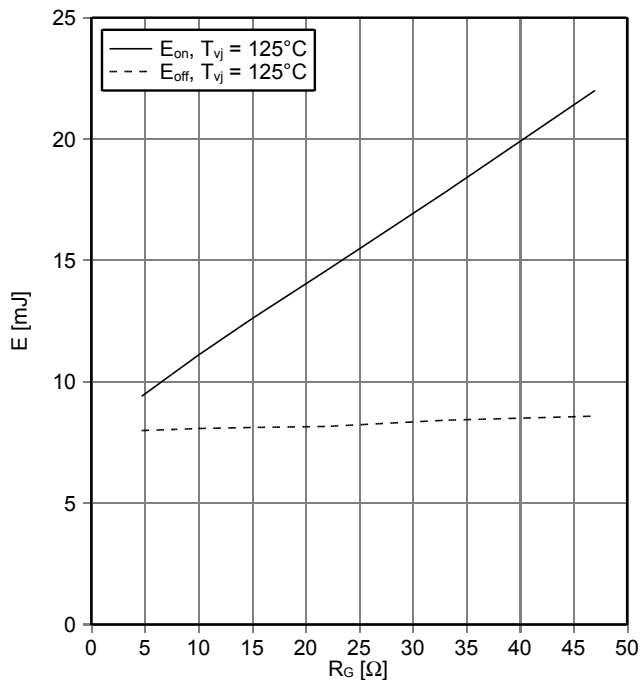


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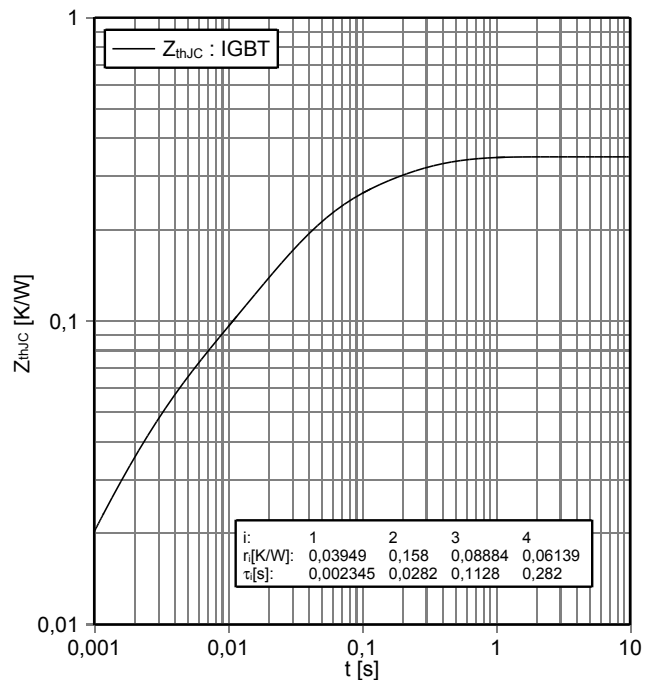
开关损耗 IGBT, 逆变器 (典型)
switching losses IGBT, Inverter (typical)

$E_{on} = f(R_G), E_{off} = f(R_G)$
 $V_{GE} = \pm 15\text{ V}, I_C = 75\text{ A}, V_{CE} = 600\text{ V}$



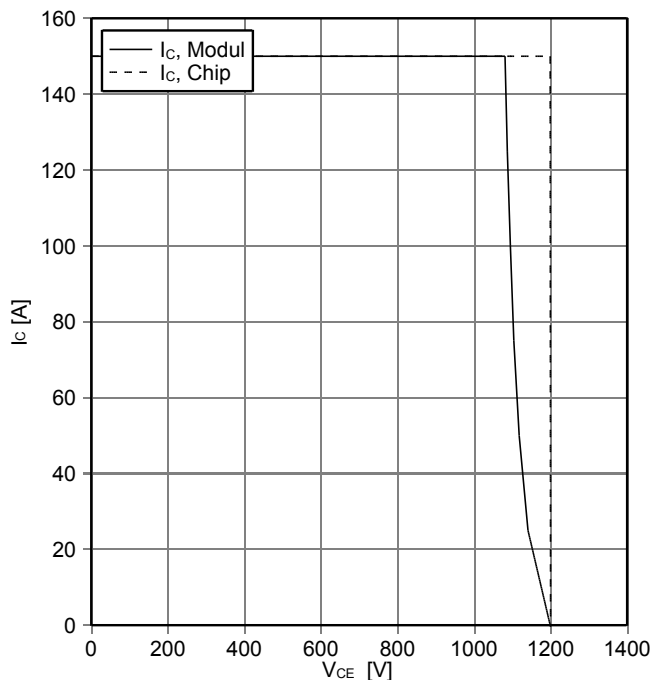
瞬态热阻抗 IGBT, 逆变器
transient thermal impedance IGBT, Inverter

$Z_{thJC} = f(t)$



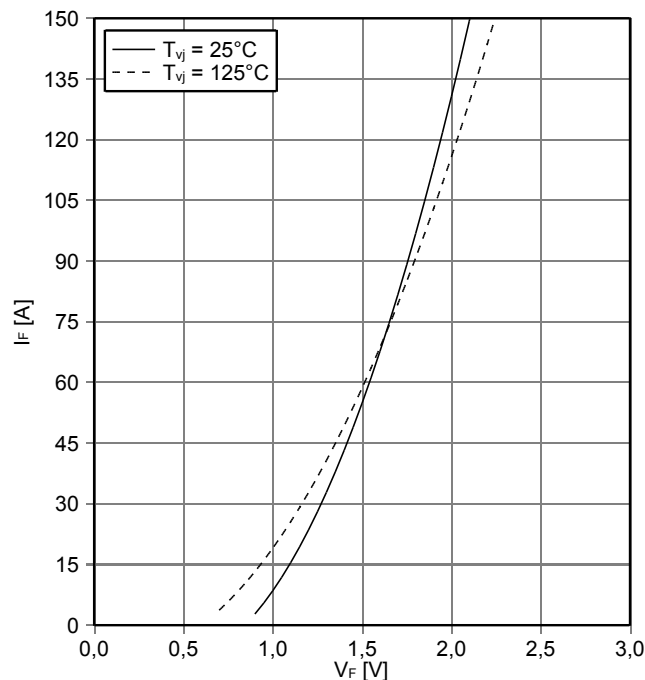
反偏安全工作区 IGBT, 逆变器 (RBSOA)
reverse bias safe operating area IGBT, Inverter (RBSOA)

$I_C = f(V_{CE})$
 $V_{GE} = \pm 15\text{ V}, R_{Goff} = 4.7\ \Omega, T_{vj} = 125^\circ\text{C}$



正向偏压特性 二极管, 逆变器 (典型)
forward characteristic of Diode, Inverter (typical)

$I_F = f(V_F)$

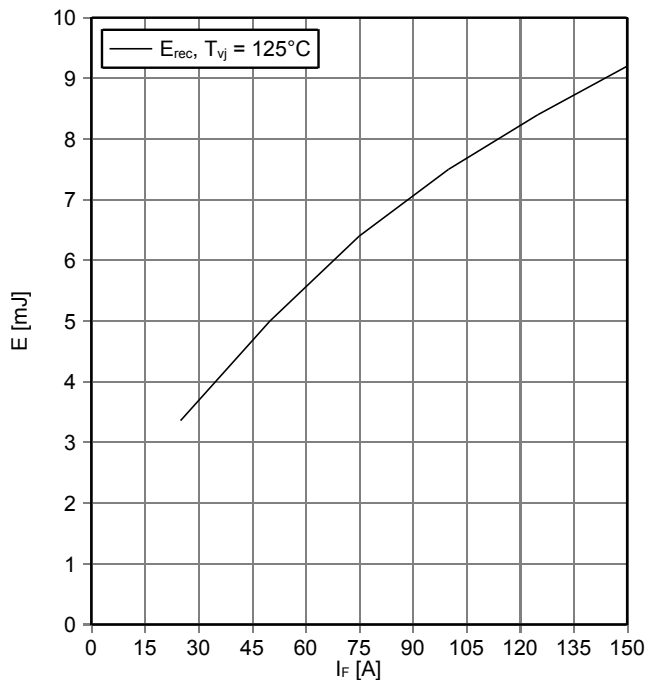


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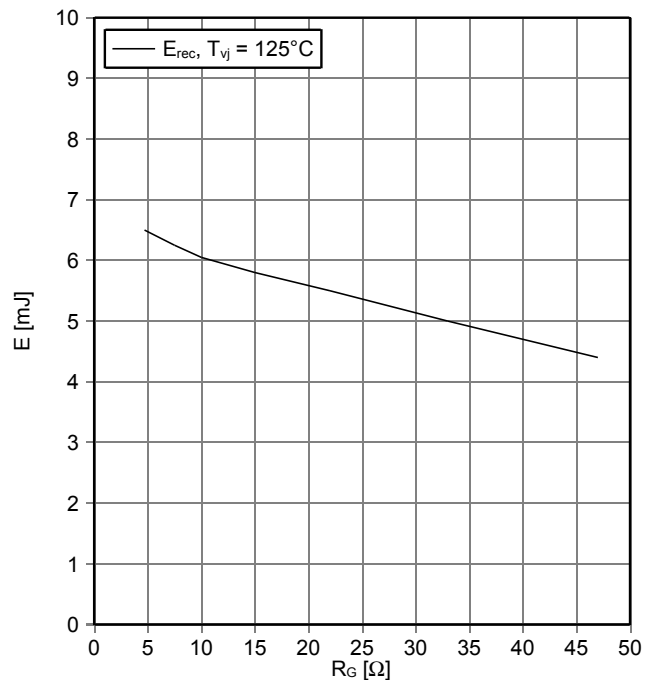
开关损耗 二极管,逆变器 (典型)
switching losses Diode, Inverter (typical)

$E_{rec} = f(I_F)$
 $R_{Gon} = 4.7 \Omega, V_{CE} = 600 V$



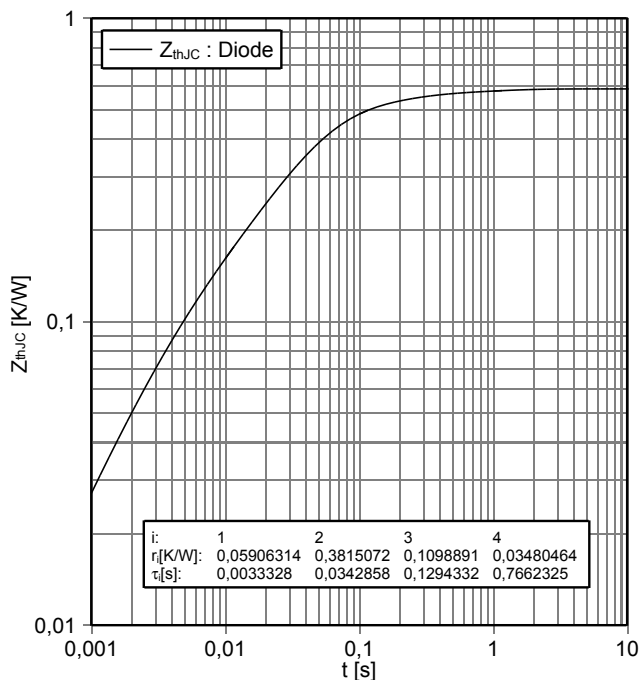
开关损耗 二极管,逆变器 (典型)
switching losses Diode, Inverter (typical)

$E_{rec} = f(R_G)$
 $I_F = 75 A, V_{CE} = 600 V$



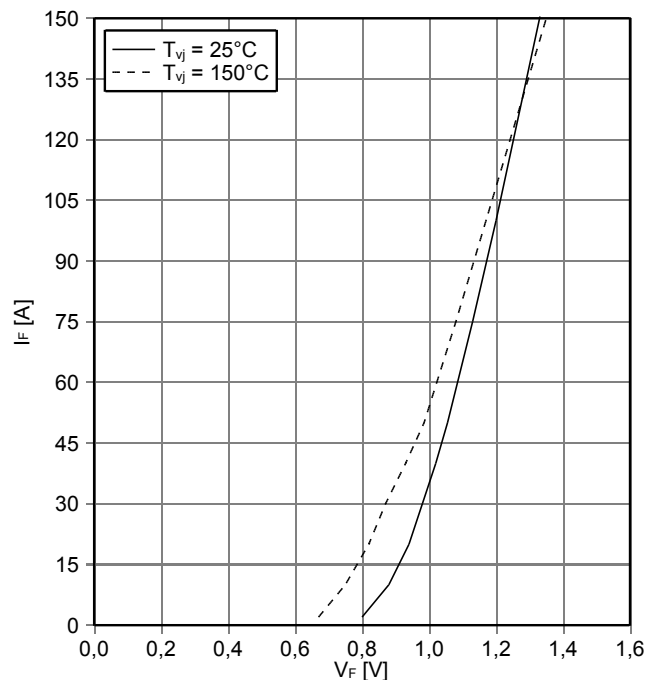
瞬态热阻抗 二极管,逆变器
transient thermal impedance Diode, Inverter

$Z_{thJC} = f(t)$



正向偏压特性 二极管,整流器 (典型)
forward characteristic of Diode, Rectifier (typical)

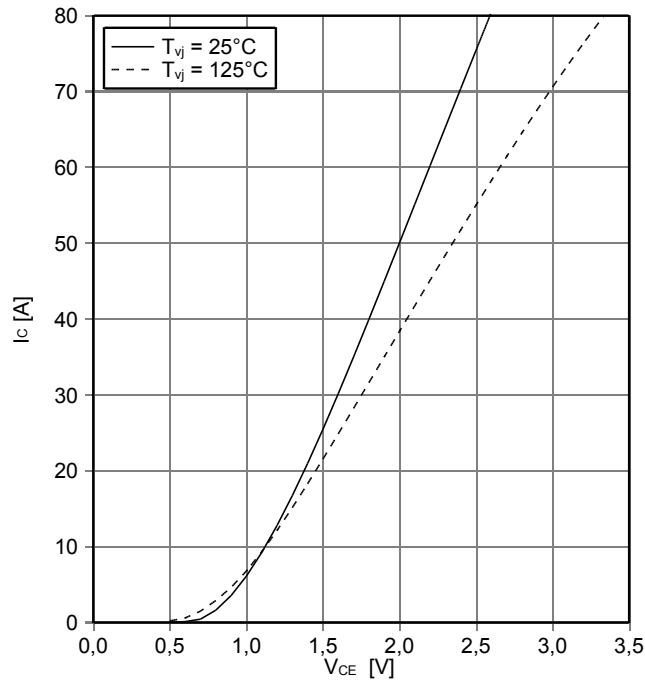
$I_F = f(V_F)$



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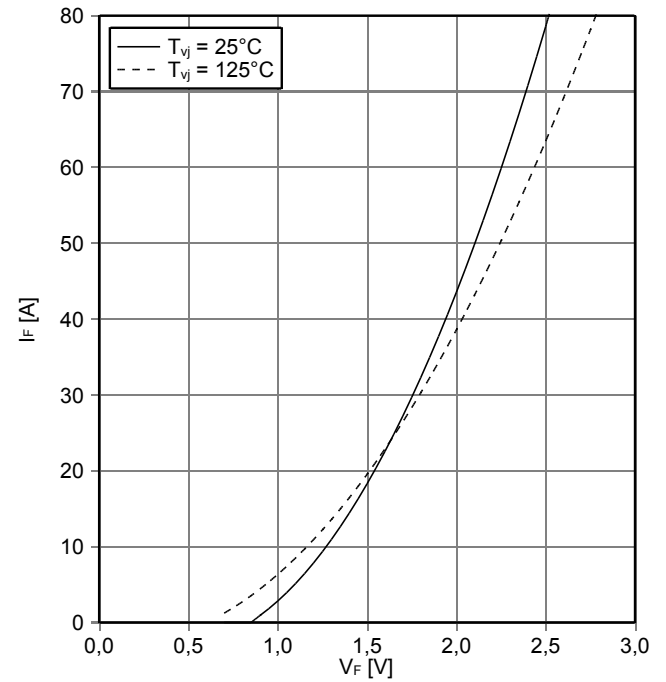
输出特性 IGBT, 制动-斩波器 (典型)
output characteristic IGBT, Brake-Chopper (typical)

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



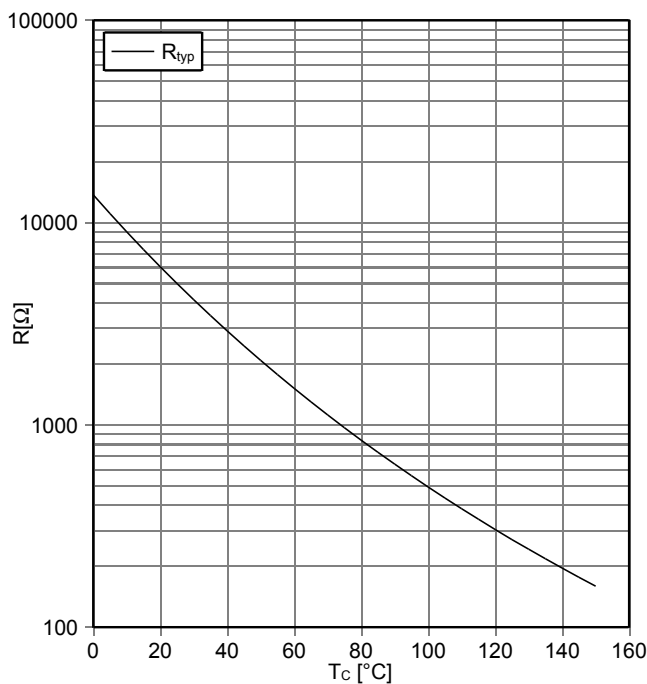
正向偏压特性 二极管, 制动-斩波器 (典型)
forward characteristic of Diode, Brake-Chopper (typical)

$I_F = f(V_F)$



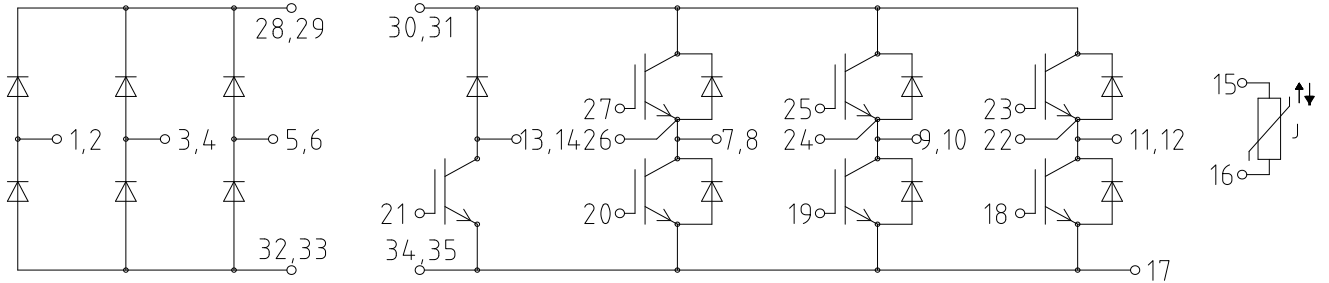
负温度系数热敏电阻 温度特性
NTC-Thermistor-temperature characteristic (typical)

$R = f(T)$

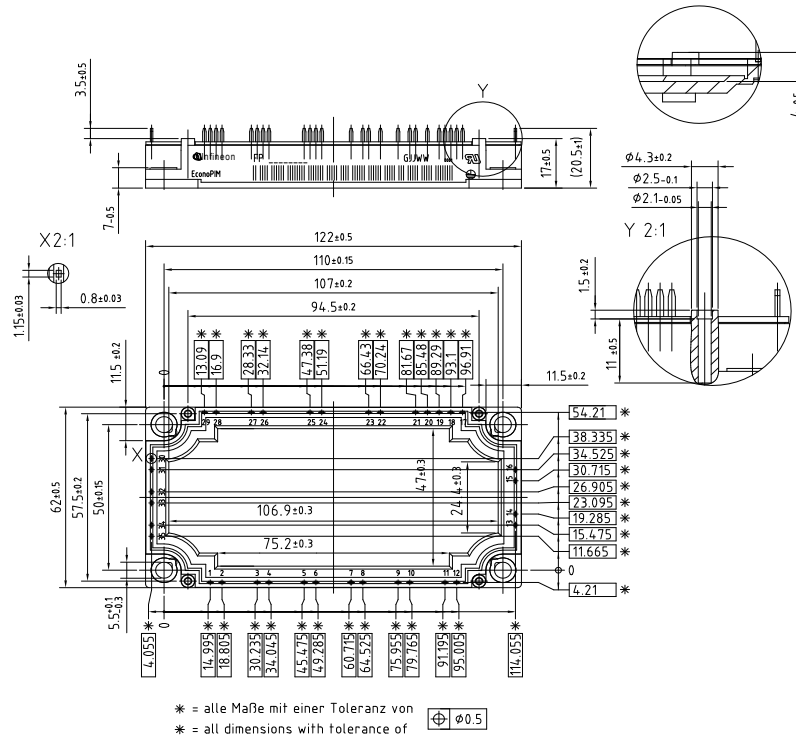


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接线图 / circuit_diagram_headline



封装尺寸 / package outlines



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