

1200V 50A ECPIM 3A IGBT Module

Features

- Trench Field Stop technology
- Low saturation voltage
- 10μs Short Circuit current
- Low turn-off losses
- Positive temperature coefficient



Applications

- AC Motor Drives
- Motion / Servo Drives
- Inverter and Power supplies

■ Absolute Maximum Ratings $T_J = 25^\circ\text{C}$ unless otherwise noted

Item	Symbol	Parameter	Conditions	Value	Units
Diode Rectifier	VRRM	Repetitive Peak Reverse Voltage		1800	V
	IFAV	Forward Current per Diode	@ $T_J = 150^\circ\text{C}$, $T_C = 80^\circ\text{C}$	50	A
	IFSM	Surge Forward Current (Chip level)	@ $t_P = 10\text{ ms}$, half sine wave	600	A
	I _{2t}	I _{2t} - Value (Chip level)	@ $t_P = 10\text{ ms}$, half sine wave	512	A ² S
	T _J	Operating Junction Temperature *(1)	-	-40 ~ 150	°C
IGBT Inverter	VCES	Collector-Emitter Breakdown Voltage	-	1200	V
	VGES	Gate-Emitter Peak Voltage	-	± 20	V
	IC	DC Collector Current	@ $T_J = 150^\circ\text{C}$, $T_C = 80^\circ\text{C}$	50	A
			@ $T_J = 150^\circ\text{C}$, $T_C = 25^\circ\text{C}$	100	A
	ICM	Repetitive Peak Forward Current	$t_P = 1\text{ ms}$	100	A
	PD	Maximum Power Dissipation	@ $T_J = 175^\circ\text{C}$, $T_C = 80^\circ\text{C}$	720	W
Diode Inverter	T _J	Operating Junction Temperature *(2)	-	-40 ~ 150	°C
	VRRM	Repetitive Peak Reverse Voltage	-	1200	V
	IF	DC Forward Current	@ $T_J = 150^\circ\text{C}$, $T_C = 80^\circ\text{C}$	50	A
	IFRM	Repetitive Peak Forward Current	@ $t_P = 1\text{ ms}$	100	A
	I _{2t}		@ $T_J = 125^\circ\text{C}$, $t = 10\text{ ms}$, $V_R = 0\text{ V}$	512	A ² S
IGBT Brake	T _J	Operating Junction Temperature *(1)	-	-40 ~ 150	°C
	VCES	Collector-Emitter Breakdown Voltage	-	1200	V
	VGES	Gate-Emitter Peak Voltage	-	± 20	V
	IC	DC Collector Current	@ $T_J = 150^\circ\text{C}$, $T_C = 80^\circ\text{C}$	35	A
	I _{Cpulse}	Repetitive Peak Collector Current	@ $t_P = 1\text{ ms}$	70	A
	PD	Maximum Power Dissipation	@ $T_J = 150^\circ\text{C}$, $T_C = 25^\circ\text{C}$	170	W
	T _J	Operating Junction Temperature *(2)	-	-40 ~ 150	°C
Diode Brake	VRRM	Repetitive Peak Reverse Voltage	-	1200	V
	IF	DC Forward Current	@ $T_J = 150^\circ\text{C}$, $T_C = 80^\circ\text{C}$	30	A
	IFRM	Repetitive Peak Forward Current	@ $t_P = 1\text{ ms}$	60	A
	I _{2t}		@ $T_J = 125^\circ\text{C}$, $t = 10\text{ ms}$, $V_R = 0\text{ V}$	480	A ² S
	T _J	Operating Junction Temperature *(1)	-	-40 ~ 150	°C
Module	T _{stg}	Storage Temperature	-	-40~125	°C
	V _{iso}	Isolation Voltage	@ AC 1minute	2500	V
	W	Weight	-	310	g

IGBT, Inverter 逆变器
Maximum Rated Values($T_C=25^{\circ}\text{C}$ unless otherwise specified)

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	$T_C = 95^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	$I_{C\text{nom}}$	50	A
集电极重复峰值电流 Repetitive peak collector current	$t_P = 1\text{ ms}$	I_{CRM}	110	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	P_{tot}	280	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	$I_C = 50\text{ A}, V_{GE} = 15\text{ V}$ $I_C = 50\text{ A}, V_{GE} = 15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 175^{\circ}\text{C}$	$V_{CE\text{sat}}$		1,65 1,85	1,95 V V
栅极阈值电压 Gate threshold voltage	$I_C = 7,40\text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$		V_{GEth}	5,0		6,8 V
栅极电荷 Gate charge	$V_{GE} = -15\text{ V} \dots +15\text{ V}$		Q_G		104	nC
内部栅极电阻 Internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$		R_{Gint}		10,0	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}		6,00	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}		0,21	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}			0,1 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}			500 nA
开通延迟时间(电感负载) Turn-on delay time, inductive load	$I_C = 50\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Gon} = 15\text{ }\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_{don}		0,18 0,19 0,19	μs μs μs
上升时间(电感负载) Rise time, inductive load	$I_C = 50\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Gon} = 15\text{ }\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_r		0,05 0,07 0,07	μs μs μs
关断延迟时间(电感负载) Turn-off delay time, inductive load	$I_C = 50\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Goff} = 15\text{ }\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_{doff}		0,35 0,45 0,47	μs μs μs
下降时间(电感负载) Fall time, inductive load	$I_C = 50\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Goff} = 15\text{ }\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_f		0,09 0,16 0,18	μs μs μs
开通损耗能量(每脉冲) Turn-on energy loss per pulse	$I_C = 50\text{ A}, V_{CE} = 600\text{ V}, L_S = 20\text{ nH}$ $V_{GE} = \pm 15\text{ V}, di/dt = 1400\text{ A}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $R_{Gon} = 15\text{ }\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{on}		3,80 5,90 6,40	mJ mJ mJ
关断损耗能量(每脉冲) Turn-off energy loss per pulse	$I_C = 50\text{ A}, V_{CE} = 600\text{ V}, L_S = 20\text{ nH}$ $V_{GE} = \pm 15\text{ V}, du/dt = 3600\text{ V}/\mu\text{s} (T_{vj} = 150^{\circ}\text{C})$ $R_{Goff} = 15\text{ }\Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{off}		2,10 3,50 4,10	mJ mJ mJ
短路数据 SC data	$V_{GE} \leq 15\text{ V}, V_{CC} = 900\text{ V}$ $V_{CE\max} = V_{CES} - L_{SCE} \cdot di/dt$ $t_P \leq 10\text{ }\mu\text{s}, T_{vj} = 125^{\circ}\text{C}$		I_{SC}		180	A
结 - 外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		R_{thJC}			0,54 K/W
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个 IGBT / per IGBT $\lambda_{Paste} = 1\text{ W}/(\text{m}\cdot\text{K}) / \lambda_{grease} = 1\text{ W}/(\text{m}\cdot\text{K})$		R_{thCH}		0,295	K/W
在开关状态下温度 Temperature under switching conditions			$T_{vj\text{op}}$	-40		150 $^{\circ}\text{C}$

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	50	A
正向重复峰值电流 Repetitive peak forward current	$t_p = 1 \text{ ms}$	I_{FRM}	110	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	560	A ² s

特征值 / Characteristic Values

			min.	typ.	max.	
正向电压 Forward voltage	$I_F = 50 \text{ A}, V_{GE} = 0 \text{ V}$ $I_F = 50 \text{ A}, V_{GE} = 0 \text{ V}$ $I_F = 50 \text{ A}, V_{GE} = 0 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	V_F	1,70 1,70 1,65	2,10	V V V
反向恢复峰值电流 Peak reverse recovery current	$I_F = 50 \text{ A}, -di_F/dt = 1400 \text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 600 \text{ V}$ $V_{GE} = -15 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	I_{RM}	50,0 59,0 65,0		A A A
恢复电荷 Recovered charge	$I_F = 50 \text{ A}, -di_F/dt = 1400 \text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 600 \text{ V}$ $V_{GE} = -15 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	Q_r	5,70 8,70 11,0		μC μC μC
反向恢复损耗 (每脉冲) Reverse recovery energy	$I_F = 50 \text{ A}, -di_F/dt = 1400 \text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 600 \text{ V}$ $V_{GE} = -15 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{rec}	1,60 3,50 3,90		mJ mJ mJ
结 - 外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode	R_{thJC}			0,81	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}		0,44		K/W
在开关状态下温度 Temperature under switching conditions		$T_{vj \text{ op}}$	-40		150	$^{\circ}\text{C}$

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}	1800	V
平均正向电流 Average forward current	$T_j = 25^{\circ}\text{C}$	I_{FRMSM}	50	A
正向浪涌电流 Surge forward current	$t_p = 10 \text{ ms}, T_{vj} = 25^{\circ}\text{C}$	I_{FSM}	600	A
I ² t-值 I ² t - value	$t_p = 10 \text{ ms}, T_{vj} = 25^{\circ}\text{C}$	I^2t	512	A ² s A ² s

特征值 / Characteristic Values

			min.	typ.	max.	
正向电压 Forward voltage	$T_{vj} = 150^{\circ}\text{C}, I_F = 50 \text{ A}$	V_F		1,20		V
反向电流 Reverse current	$T_{vj} = 150^{\circ}\text{C}, V_R = 1600 \text{ V}$	I_R		1,00		mA
结 - 外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode	R_{thJC}			0,85	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}		0,465		K/W
在开关状态下温度 Temperature under switching conditions		$T_{vj \text{ op}}$	-40		150	$^{\circ}\text{C}$

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	$T_C = 100^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	$I_{C\text{nom}}$	35	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	P_{tot}	170	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	$I_C = 35\text{ A}, V_{GE} = 15\text{ V}$ $I_C = 35\text{ A}, V_{GE} = 15\text{ V}$ $I_C = 35\text{ A}, V_{GE} = 15\text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$V_{CE\text{sat}}$	1,70 2,45 2,50	2,50	V V V
栅极阈值电压 Gate threshold voltage	$I_C = 1,40\text{ mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$		V_{GEth}	5,2	5,6	6,2 V
栅极电荷 Gate charge	$V_{GE} = -15\text{ V} \dots +15\text{ V}$		Q_G	67		nC
内部栅极电阻 Internal gate resistor	$T_{vj} = 25^{\circ}\text{C}$		R_{Gint}	5,0		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}	2095		pF
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}	12		pF
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}		5	μA
栅极-发射极漏电流 Gate-emitter leakage current	$V_{CE} = 0\text{ V}, V_{GE} = 15\text{ V}, T_{vj} = 25^{\circ}\text{C}$		I_{GES}		300	nA
开通延迟时间(电感负载) Turn-on delay time, inductive load	$I_C = 35\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Gon} = 37\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{d\text{on}}$	0,07 0,08 0,09		μs μs μs
上升时间(电感负载) Rise time, inductive load	$I_C = 35\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Gon} = 37\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_r	0,05 0,06 0,07		μs μs μs
关断延迟时间(电感负载) Turn-off delay time, inductive load	$I_C = 35\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Goff} = 37\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	$t_{d\text{off}}$	0,35 0,45 0,47		μs μs μs
下降时间(电感负载) Fall time, inductive load	$I_C = 35\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_{Goff} = 37\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	t_f	0,06 0,08 0,09		μs μs μs
开通损耗能量(每脉冲) Turn-on energy loss per pulse	$I_C = 35\text{ A}, V_{CE} = 600\text{ V}, L_S = \text{t.b.d. nH}$ $V_{GE} = \pm 15\text{ V}$ $R_{Gon} = 37\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{on}	2,20 2,90 3,40		mJ mJ mJ
关断损耗能量(每脉冲) Turn-off energy loss per pulse	$I_C = 35\text{ A}, V_{CE} = 600\text{ V}, L_S = \text{t.b.d. nH}$ $V_{GE} = \pm 15\text{ V}$ $R_{Goff} = 37\ \Omega$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{off}	1,60 2,40 2,60		mJ mJ mJ
短路数据 SC data	$V_{GE} \leq 15\text{ V}, V_{CC} = 900\text{ V}$ $V_{CE\text{max}} = V_{CES} - L_{d\text{CE}} \cdot di/dt$ $t_P \leq 10\ \mu\text{s}, T_{vj} = 150^{\circ}\text{C}$		I_{SC}	90		A
结 - 外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		R_{thJC}		0,95	K/W
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个 IGBT / per IGBT $\lambda_{\text{paste}} = 1\text{ W/(m}\cdot\text{K)} / \lambda_{\text{grease}} = 1\text{ W/(m}\cdot\text{K)}$		R_{thCH}	0,52		K/W
在开关状态下温度 Temperature under switching conditions			$T_{vj\text{op}}$	-40	150	$^{\circ}\text{C}$

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	30	A
正向重复峰值电流 Repetitive peak forward current	$t_P = 1 \text{ ms}$	I_{FRM}	60	A
I_{2t} - I^2t - value	$V_R = 0 \text{ V}, t_P = 10 \text{ ms}, T_{vj} = 125^{\circ}\text{C}$	I^2t	480	A^2s

特征值 / Characteristic Values

			min.	typ.	max.	
正向电压 Forward voltage	$I_F = 30 \text{ A}, V_{GE} = 0 \text{ V}$ $I_F = 30 \text{ A}, V_{GE} = 0 \text{ V}$ $I_F = 30 \text{ A}, V_{GE} = 0 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	V_F	2,00 1,70 1,70	2,40 2,20	V V V
反向漏电流 Reverse Leakage Current	$V_R = 1200 \text{ V}, T_a = 25^{\circ}\text{C}$ $V_R = 1200 \text{ V}, T_a = 25^{\circ}\text{C}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$	I_R	10,0 15,0		μA μA
恢复电荷 Recovered charge	$I_F = 30 \text{ A}, -di_F/dt = 1000 \text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 600 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	Q_r	1,70 2,80 2,90		μC μC μC
反向恢复损耗 (每脉冲) Reverse recovery energy	$I_F = 30 \text{ A}, -di_F/dt = 1000 \text{ A}/\mu\text{s} (T_{vj}=150^{\circ}\text{C})$ $V_R = 600 \text{ V}$	$T_{vj} = 25^{\circ}\text{C}$ $T_{vj} = 125^{\circ}\text{C}$ $T_{vj} = 150^{\circ}\text{C}$	E_{rec}	0,60 0,95 1,20		mJ mJ mJ
结 - 外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		R_{thJC}		1,50	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}	0,82		K/W
在开关状态下温度 Temperature under switching conditions			$T_{vj op}$	-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	$T_C = 25^{\circ}\text{C}$	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	$R_2 = R_{25} \exp [B_{25/80}(1/T_2 - 1/(298,15 \text{ K}))]$	$B_{25/80}$		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

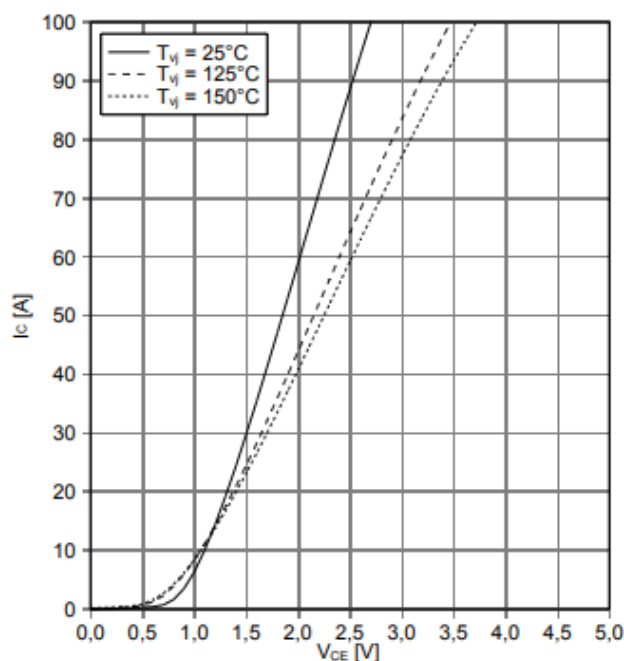
根据应用手册标定

Specification according to the valid application note.

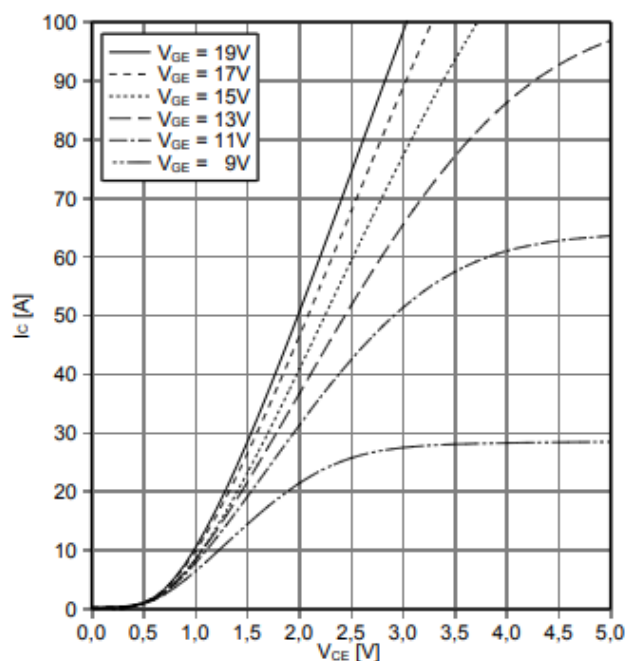
模块 / Module

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	> 200	
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}	min. 0,02	typ. max. K/W
杂散电感, 模块 Stray inductance module		L _{sCE}	35	nH
最大结温 Maximum junction temperature	逆变器, 制动-斩波器 / inverter, brake-chopper 整流器 / rectifier	T _{vj max}		175 °C 150 °C
在开关状态下温度 Temperature under switching conditions	逆变器, 制动-斩波器 / inverter, brake-chopper 整流器 / rectifier	T _{vj op}	-40 -40	150 °C 150 °C
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	180	g

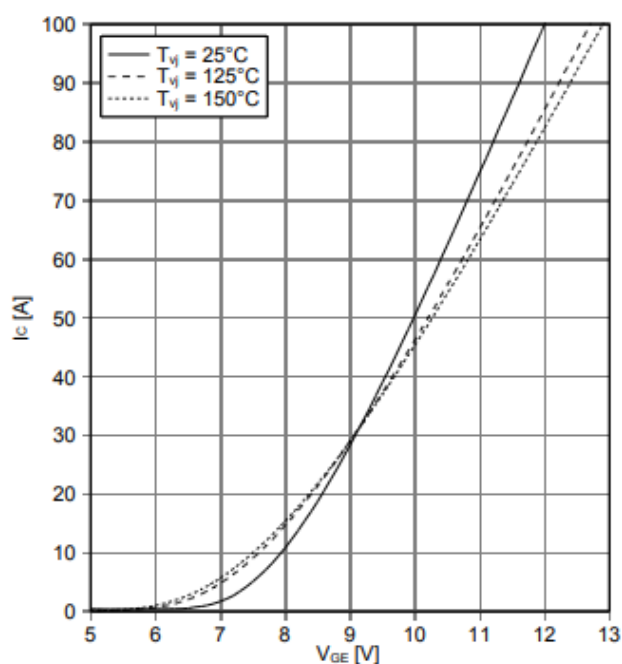
输出特性 IGBT, 逆变器 (典型)
output characteristic IGBT, Inverter (typical)
 $I_C = f(V_{CE})$
 $V_{GE} = 15\text{ V}$



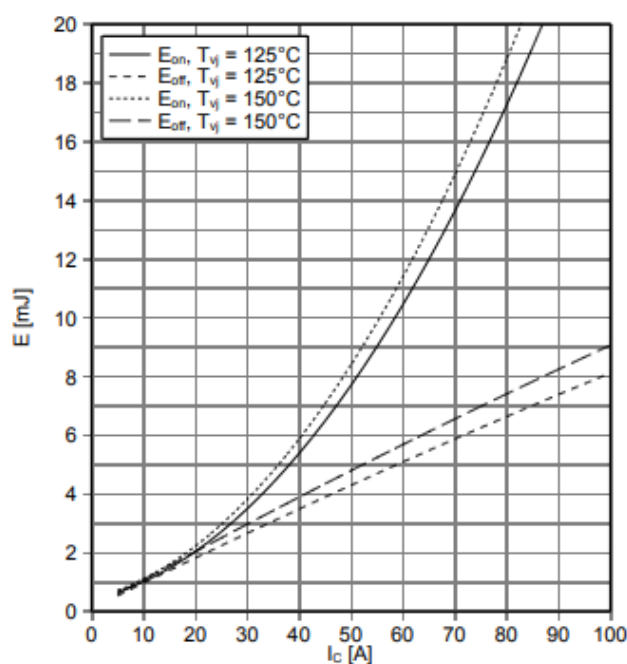
输出特性 IGBT, 逆变器 (典型)
output characteristic IGBT, Inverter (typical)
 $I_C = f(V_{CE})$
 $T_{vj} = 150^\circ\text{C}$



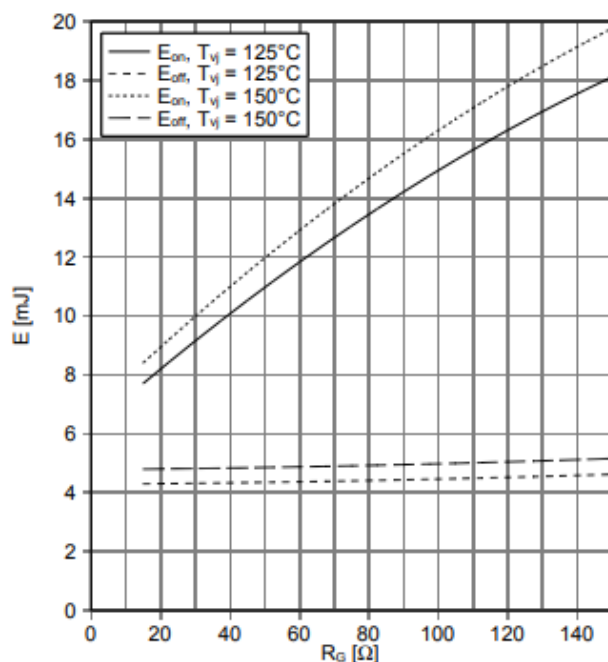
传输特性 IGBT, 逆变器 (典型)
transfer characteristic IGBT, Inverter (typical)
 $I_C = f(V_{GE})$
 $V_{CE} = 20\text{ V}$



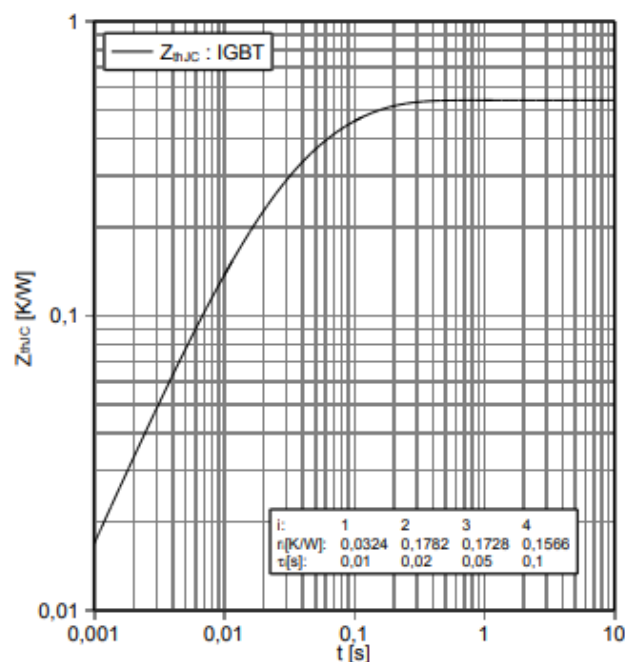
开关损耗 IGBT, 逆变器 (典型)
switching losses IGBT, Inverter (typical)
 $E_{on} = f(I_C)$, $E_{off} = f(I_C)$
 $V_{GE} = \pm 15\text{ V}$, $R_{Gon} = 15\ \Omega$, $R_{Goff} = 15\ \Omega$, $V_{CE} = 600\text{ V}$



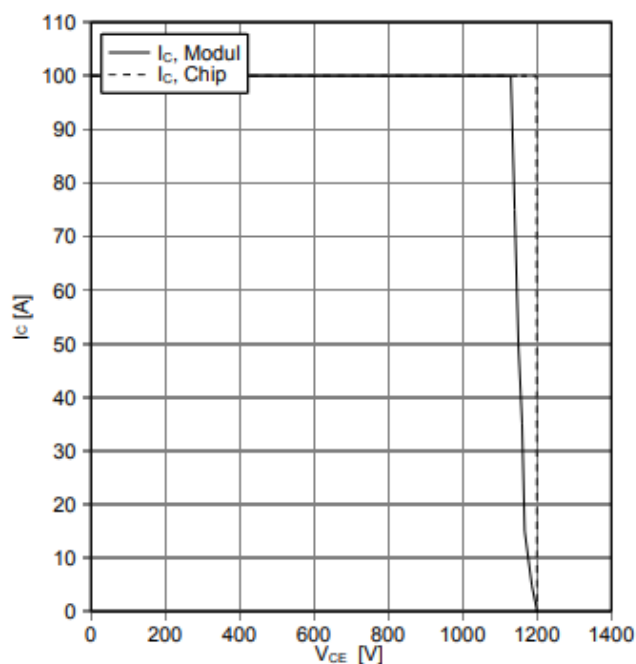
开关损耗 IGBT, 逆变器 (典型)
switching losses IGBT, Inverter (typical)
 $E_{on} = f(R_G)$, $E_{off} = f(R_G)$
 $V_{GE} = \pm 15\text{ V}$, $I_C = 50\text{ A}$, $V_{CE} = 600\text{ V}$



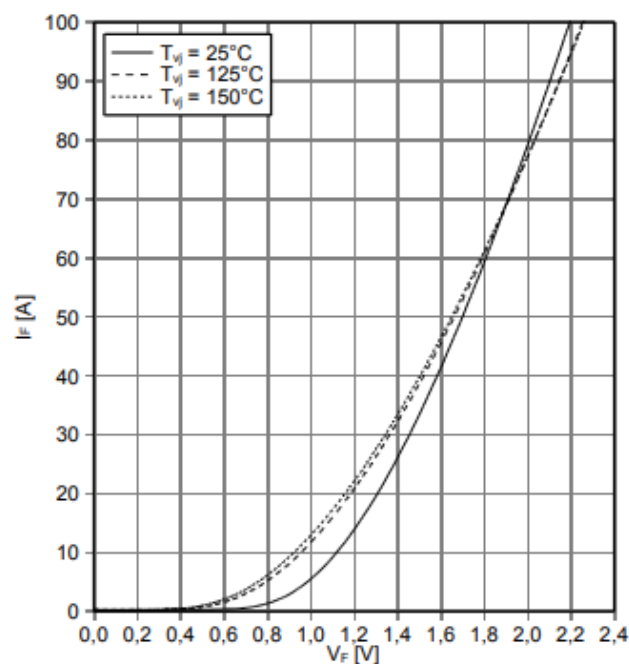
瞬态热阻抗 IGBT, 逆变器
transient thermal impedance IGBT, Inverter
 $Z_{thJC} = f(t)$



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

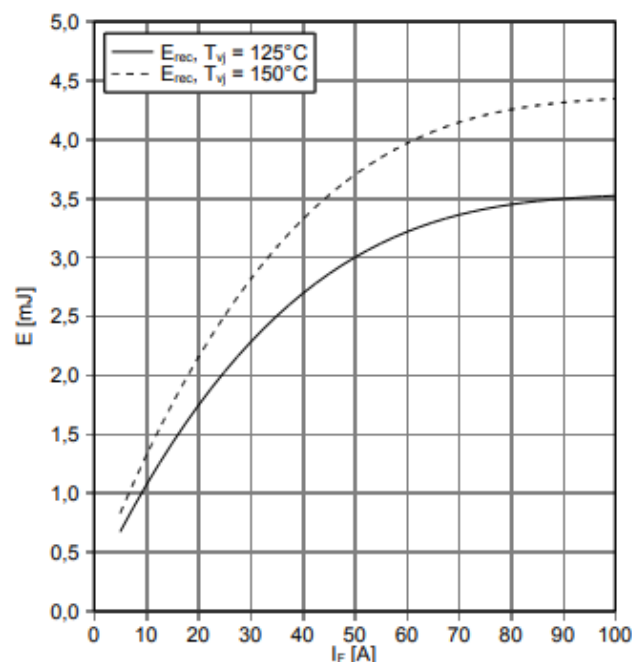


正向偏压特性 二极管, 逆变器 (典型)
forward characteristic of Diode, Inverter (typical)
 $I_F = f(V_F)$



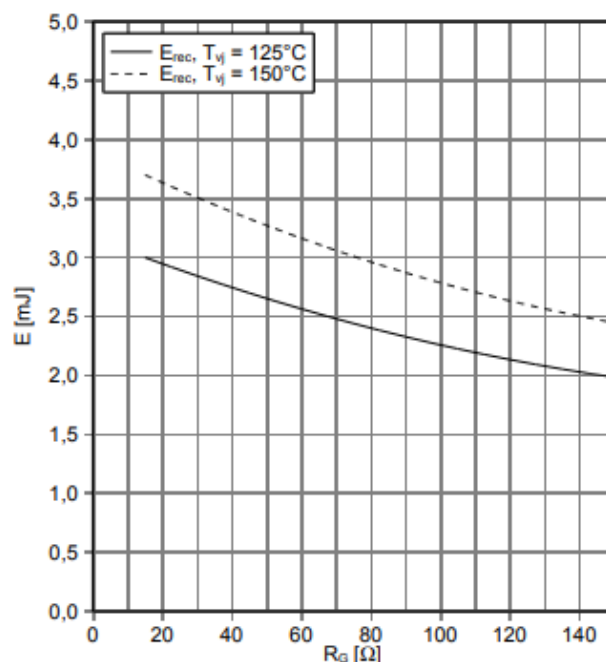
开关损耗 二极管,逆变器 (典型)
switching losses Diode, Inverter (typical)

$E_{rec} = f(I_F)$
 $R_{Gon} = 15 \Omega$, $V_{CE} = 600 V$



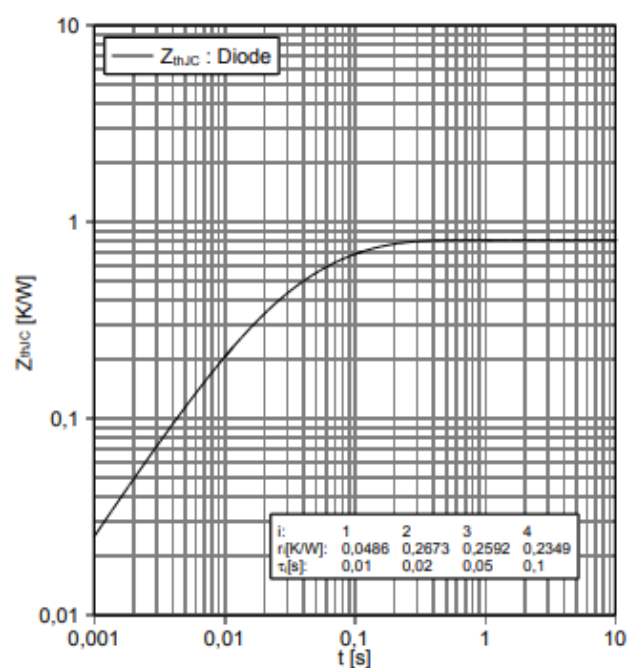
开关损耗 二极管,逆变器 (典型)
switching losses Diode, Inverter (typical)

$E_{rec} = f(R_G)$
 $I_F = 50 A$, $V_{CE} = 600 V$



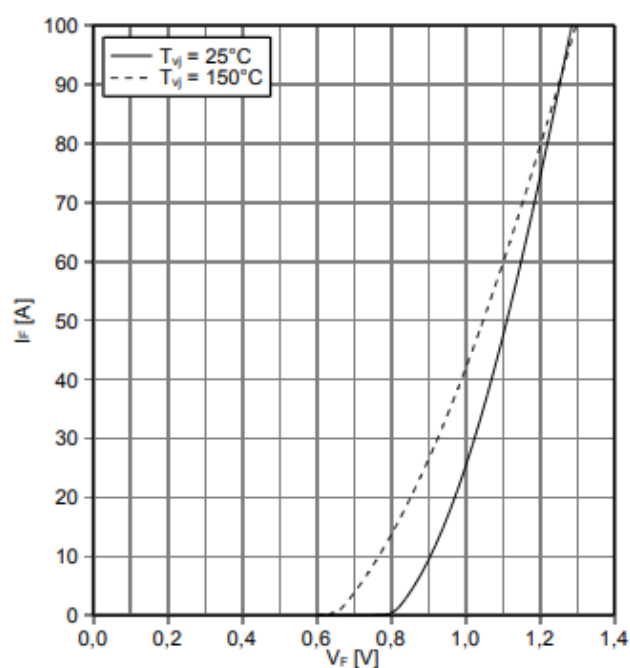
瞬态热阻抗 二极管,逆变器
transient thermal impedance Diode, Inverter

$Z_{thJC} = f(t)$

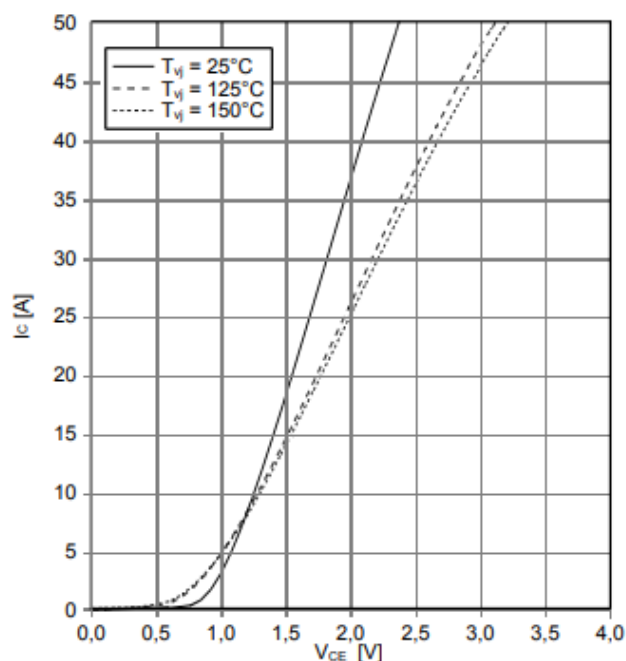


正向偏压特性 二极管,整流器 (典型)
forward characteristic of Diode, Rectifier (typical)

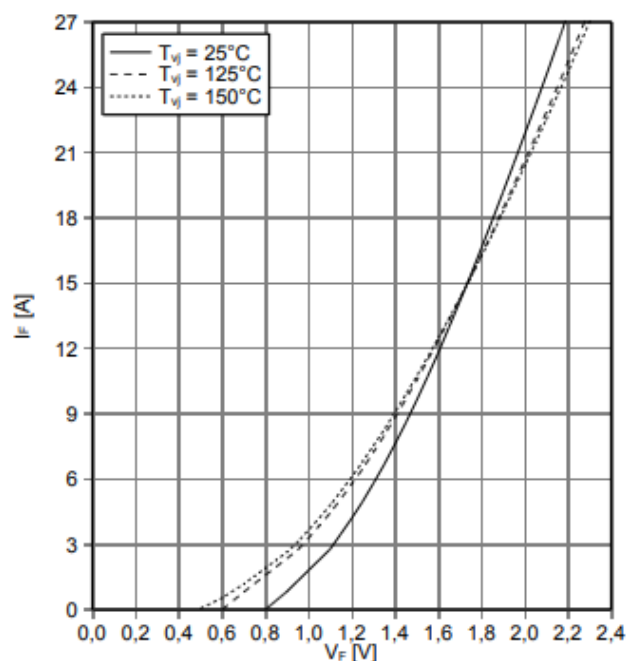
$I_F = f(V_F)$



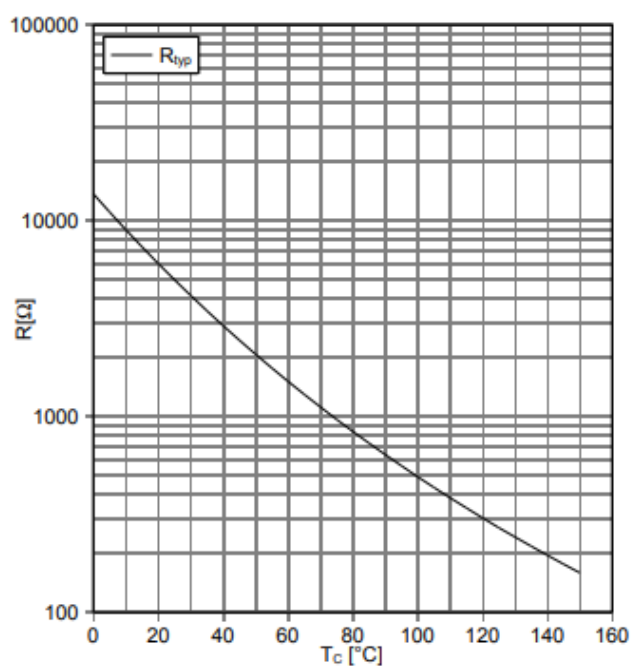
输出特性 IGBT, 制动-斩波器 (典型)
output characteristic IGBT, Brake-Chopper (typical)
 $I_C = f(V_{CE})$
 $V_{GE} = 15\text{ V}$



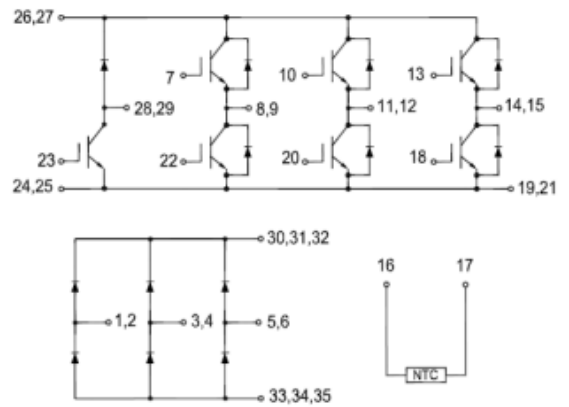
正向偏压特性 二极管, 制动-斩波器 (典型)
forward characteristic of Diode, Brake-Chopper (typical)
 $I_F = f(V_F)$



负温度系数热敏电阻 温度特性
NTC-Thermistor-temperature characteristic (typical)
 $R = f(T)$



接线图 / circuit_diagram_headline



封装尺寸 / package outlines

