

ACP-3S I型三电平NPC逆变模块 ACP-3S I Type 3-Level NPC Inverter Module

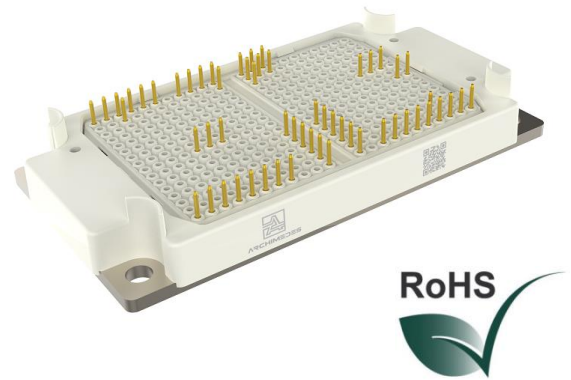
特性

Features

- 中性点位三电平逆变模块
Neutral Point Clamped Three-level Inverter Module
- 低电感布局
Low Inductive layout
- 低VCEsat/低开关损耗
Low VCEsat / Low Switching Losses
- 紧凑型设计
Compact Design
- 带铜基板
With copper baseplate

模块外观

Module Appearance



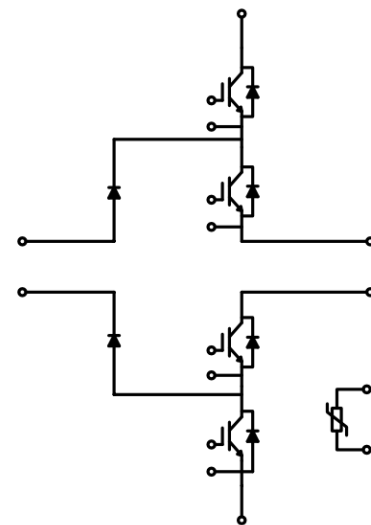
应用

Application

- 三电平应用/3-Level-Applications
- 储能/PCS
- 不间断电源/UPS Systems
- 太阳能系统/Solar Applications
- 电能质量/APF/SVG

电路拓扑

Circuit Topology



关键参数[T1&T4/D5&D6]

Key Parameters

Parameter		Symbol	Value	Unit
集电极－发射极电压 Collector-emitter voltage		V_{CES}	1200	V
连续集电极直流电流 Continuous DC collector current		I_{Cnom}	600	A
集电极重复峰值电流 Repetitive peak collector current		I_{CRM}	1200	A
集电极－发射极 饱和电压 Collector-Emitter saturation voltage	$T_{vj}=25^{\circ}\text{C}$	$*V_{CEsat}$	1.75	V
	$T_{vj}=125^{\circ}\text{C}$		2.10	
IGBT结－散热器热阻 IGBT thermal resistance		R_{thJH}	0.19	K/W
Diode结－散热器热阻 Diode thermal resistance		R_{thJH}	0.26	K/W
开通损耗能量 Turn-on energy	$T_{vj}=25^{\circ}\text{C}$	E_{on}	15.9	mJ
	$T_{vj}=125^{\circ}\text{C}$		17.4	
关断损耗能量 Turn-off energy	$T_{vj}=25^{\circ}\text{C}$	E_{off}	16.8	
	$T_{vj}=125^{\circ}\text{C}$		21.7	

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封装/Package

表 1 绝缘参数/Insulation coordination

Parameter	Conditions	Symbol	Value	Unit
绝缘测试电压 Isolation test voltage	DC, t = 3s	V_{ISOL}	5.0	kV
	RMS, f = 50Hz, t = 60s		3.5	
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_2O_3	
爬电距离 Creepage distance		d_{Creep}	> 12.7	mm
电气间隙 Clearance		d_{Clear}	> 12.7	mm
相对电痕指数 Comparative tracking index		CTI	≥ 600	

表 2 特征值/Characteristic values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
杂散电感, 模块 Stray inductance module		L_{sCE}		20		nH
储存温度 Storage temperature		T_{stg}	-40		125	°C
允许开关的温度范围 Temperature under switching conditions		$T_{vj(op)}$	-40		150	°C
重量 Weight		G		260		g

IGBT/ T1&T4
表 3 最大标定值/Maximum rated values

Parameter	Conditions	Symbol	Value	Unit
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	$T_H = 80^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	I_{CDC}	336	A
集电极重复峰值电流 Repetitive peak collector current	t_p limited by $T_{vj\max}$	I_{CRM}	1200	A
总耗散功率 Total Power dissipation	$T_H = 80^{\circ}\text{C}, T_{vj} = T_{vj\max}$	P_{tot}	500	W
栅极—发射极电压 Gate-emitter peak voltage		V_{GES}	± 20	V

表 4 特征值/Characteristic values

Parameter	Conditions		Symbol	Value			Unit
				Min.	Typ.	Max.	
集电极-发射极饱和电压 Collector-emitter saturation voltage	$I_C = 400\text{A}, V_{GE} = 15\text{V}$	$T_{vj} = 25^{\circ}\text{C}$	$*V_{CE(sat)}$		1.48		V
		$T_{vj} = 125^{\circ}\text{C}$			1.71		
		$T_{vj} = 150^{\circ}\text{C}$			1.80		
	$I_C = 600\text{A}, V_{GE} = 15\text{V}$	$T_{vj} = 25^{\circ}\text{C}$			1.75		
		$T_{vj} = 125^{\circ}\text{C}$			2.10		
		$T_{vj} = 150^{\circ}\text{C}$			2.24		
栅极阈值电压 Gate threshold voltage	$I_C = 4.0\text{mA}, V_{GE} = V_{CE}, T_{vj} = 25^{\circ}\text{C}$		V_{GEth}		4.70		V
栅极电荷 Gate charge	$V_{GE} = +15/-8\text{V}, V_{CE} = 600\text{V}, I_C = 400\text{A}$		Q_G		1480		nC
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}		33.0		nF
输出电容 Onput capacitance	$f = 1\text{MHz}, T_{vj} = 25^{\circ}\text{C}, V_{CE} = 25\text{V}, V_{GE} = 0\text{V}$		C_{oes}		4.5		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}		0.12		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}			500	μA
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}			1000	nA
开通延迟时间（感性负载） Turn-on delay time (inductive load)	$V_{CE} = 600\text{V}$ $I_C = 400\text{A}$ $V_{GE} = +15/-8\text{V}$ $R_{Gon} = 5.1\Omega$	$T_{vj} = 25^{\circ}\text{C}$	$t_{d(on)}$		79		ns
		$T_{vj} = 125^{\circ}\text{C}$			76		
		$T_{vj} = 150^{\circ}\text{C}$			74		
上升时间（感性负载） Rise time (inductive load)	$R_{Goff} = 2.0\Omega$ $L_s = 20\text{nH}$ Inductive Load	$T_{vj} = 25^{\circ}\text{C}$	t_r		42		ns
		$T_{vj} = 125^{\circ}\text{C}$			45		
		$T_{vj} = 150^{\circ}\text{C}$			46		

关断延迟时间（感性负载） Turn-off delay time (inductive load)		$T_{vj} = 25^{\circ}\text{C}$	$t_{d(off)}$		175		ns
		$T_{vj} = 125^{\circ}\text{C}$			180		
		$T_{vj} = 150^{\circ}\text{C}$			185		
下降时间（感性负载） Fall time (inductive load)		$T_{vj} = 25^{\circ}\text{C}$	t_f		150		ns
		$T_{vj} = 125^{\circ}\text{C}$			205		
		$T_{vj} = 150^{\circ}\text{C}$			215		
开通损耗能量（每脉冲） Turn-on energy loss per pulse		$T_{vj} = 25^{\circ}\text{C}$	E_{on}		15.9		mJ
		$T_{vj} = 125^{\circ}\text{C}$			17.4		
		$T_{vj} = 150^{\circ}\text{C}$			19.3		
关断损耗能量（每脉冲） Turn-off energy loss per pulse		$T_{vj} = 25^{\circ}\text{C}$	E_{off}		16.8		mJ
		$T_{vj} = 125^{\circ}\text{C}$			21.7		
		$T_{vj} = 150^{\circ}\text{C}$			22.7		
结—散热器热阻 Thermal resistance, junction to heatsink	每个IGBT, $\lambda_{grease} = 3.4\text{W}/(\text{m}^{\circ}\text{K})$ Per IGBT, $\lambda_{grease} = 3.4\text{W}/(\text{m}^{\circ}\text{K})$		R_{thJH}		0.19		K/W
最高结温 $T_{vj\max}$			$T_{vj\max}$	175			$^{\circ}\text{C}$

Diode/ D5&D6

表 5 最大标定值/Maximum rated values

Parameter	Conditions	Symbol	Value	Unit
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	$T_H = 80^{\circ}\text{C}$, $T_{vj\max} = 175^{\circ}\text{C}$	I_F	152	A
总耗散功率 Total Power dissipation	$T_H = 80^{\circ}\text{C}$, $T_{vj} = T_{vj\max}$	P_{tot}	365	W
正向重复峰值电流 Repetitive peak forward current	t_p limited by $T_{vj\max}$	I_{FRM}	800	A

表 6 特征值/Characteristic values

Parameter	Conditions		Symbol	Value			Unit
				Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F = 400A, V_{GE} = 0V$	$T_{vj} = 25^{\circ}C$	$*V_F$		1.77		V
		$T_{vj} = 125^{\circ}C$			2.36		
		$T_{vj} = 150^{\circ}C$			2.65		
	$I_F = 600A, V_{GE} = 0V$	$T_{vj} = 25^{\circ}C$			2.24		
		$T_{vj} = 125^{\circ}C$			3.29		

		$T_{vj} = 150^{\circ}\text{C}$			3.68		
反向恢复时间 Reverse recovery time		$T_{vj} = 25^{\circ}\text{C}$	t_{rr}		43		ns
		$T_{vj} = 125^{\circ}\text{C}$			44		
		$T_{vj} = 150^{\circ}\text{C}$			65		
反向恢复峰值电流 Peak reverse recovery current	$V_R = 600\text{V}$ $I_F = 400\text{A}$ $V_{GE} = -8\text{V}$	$T_{vj} = 25^{\circ}\text{C}$	I_{RM}		58		A
		$T_{vj} = 125^{\circ}\text{C}$			61		
		$T_{vj} = 150^{\circ}\text{C}$			91		
反向恢复电荷 Recovered charge	$R_{Gon} = 5.1\Omega$ $L_s = 20\text{nH}$ Inductive Load	$T_{vj} = 25^{\circ}\text{C}$	Q_r		1.0		μC
		$T_{vj} = 125^{\circ}\text{C}$			2.5		
		$T_{vj} = 150^{\circ}\text{C}$			4.3		
反向恢复损耗（每脉冲） Reverse recovery energy		$T_{vj} = 25^{\circ}\text{C}$	E_{rec}		0.35		mJ
		$T_{vj} = 125^{\circ}\text{C}$			0.74		
		$T_{vj} = 150^{\circ}\text{C}$			1.23		
结—散热器热阻 Thermal resistance, junction to heatsink	每个二极管, $\lambda_{grease} = 3.4\text{W}/(\text{m}^2\text{K})$ Per diode, $\lambda_{grease} = 3.4\text{W}/(\text{m}^2\text{K})$		R_{thJH}		0.26		K/W
最高结温 $T_{vj\max}$			$T_{vj\max}$		175		$^{\circ}\text{C}$

IGBT/ T2&T3

表 7 最大标定值/Maximum rated values

Parameter	Conditions	Symbol	Value	Unit
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	$T_H = 80^{\circ}\text{C}$, $T_{vj\max} = 175^{\circ}\text{C}$	I_{CDC}	336	A
集电极重复峰值电流 Repetitive peak collector current	t_p limited by $T_{vj\max}$	I_{CRM}	1200	A
总耗散功率 Total Power dissipation	$T_H = 80^{\circ}\text{C}$, $T_{vj} = T_{vj\max}$	P_{tot}	500	W
栅极—发射极电压 Gate-emitter peak voltage		V_{GES}	± 20	V

表 8 特征值/Characteristic values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
集电极-发射极饱和电压 Collector-emitter saturation voltage	$I_C = 400\text{A}$, $V_{GE} = 15\text{V}$	$T_{vj} = 25^{\circ}\text{C}$		1.48		V
		$T_{vj} = 125^{\circ}\text{C}$		1.71		
		$T_{vj} = 150^{\circ}\text{C}$		1.80		

	$I_C = 600A, V_{GE} = 15V$	$T_{vj} = 25^{\circ}C$			1.75		
		$T_{vj} = 125^{\circ}C$			2.10		
		$T_{vj} = 150^{\circ}C$			2.24		
栅极阈值电压 Gate threshold voltage	$I_C = 4.0mA, V_{GE} = V_{CE}, T_{vj} = 25^{\circ}C$		V_{GEth}		4.70		V
栅极电荷 Gate charge	$V_{GE} = +15/-8V, V_{CE} = 600V, I_C = 400A$		Q_G		1480		nC
输入电容 Input capacitance	$f = 1MHz, T_{vj} = 25^{\circ}C, V_{CE} = 25V, V_{GE} = 0V$		C_{ies}		33.0		nF
输出电容 Onput capacitance	$f = 1MHz, T_{vj} = 25^{\circ}C, V_{CE} = 25V, V_{GE} = 0V$		C_{oes}		4.5		nF
反向传输电容 Reverse transfer capacitance	$f = 1MHz, T_{vj} = 25^{\circ}C, V_{CE} = 25V, V_{GE} = 0V$		C_{res}		0.12		nF
集电极－发射极截止电流 Collector-emitter cut-off current	$V_{CE} = 1200V, V_{GE} = 0V, T_{vj} = 25^{\circ}C$		I_{CES}			500	μA
栅极－发射极漏电流 Gate-emitter leakage current	$V_{CE} = 0V, V_{GE} = 20V, T_{vj} = 25^{\circ}C$		I_{GES}			1000	nA
开通延迟时间（感性负载） Turn-on delay time (inductive load)	$V_{CE} = 600V$ $I_C = 400A$ $V_{GE} = +15/-8V$ $R_{Gon} = 5.1\Omega$ $R_{Goff} = 2.0\Omega$ $LS = 30nH$ <i>Inductive Load</i>	$T_{vj} = 25^{\circ}C$	$t_{d(on)}$		81		ns
		$T_{vj} = 125^{\circ}C$			80		
		$T_{vj} = 150^{\circ}C$			78		
上升时间（感性负载） Rise time (inductive load)		$T_{vj} = 25^{\circ}C$	t_r		54		ns
		$T_{vj} = 125^{\circ}C$			56		
		$T_{vj} = 150^{\circ}C$			57		
关断延迟时间（感性负载） Turn-off delay time (inductive load)		$T_{vj} = 25^{\circ}C$	$t_{d(off)}$		175		ns
		$T_{vj} = 125^{\circ}C$			185		
		$T_{vj} = 150^{\circ}C$			220		
下降时间（感性负载） Fall time (inductive load)		$T_{vj} = 25^{\circ}C$	t_f		135		ns
		$T_{vj} = 125^{\circ}C$			225		
		$T_{vj} = 150^{\circ}C$			270		
开通损耗能量（每脉冲） Turn-on energy loss per pulse		$T_{vj} = 25^{\circ}C$	E_{on}		17.7		mJ
		$T_{vj} = 125^{\circ}C$			18.9		
		$T_{vj} = 150^{\circ}C$			20.1		
关断损耗能量（每脉冲） Turn-off energy loss per pulse		$T_{vj} = 25^{\circ}C$	E_{off}		18.4		mJ
		$T_{vj} = 125^{\circ}C$			32.3		
		$T_{vj} = 150^{\circ}C$			36.2		
结－散热器热阻 Thermal resistance, junction to heatsink	每个IGBT, $\lambda_{grease} = 3.4W/(m^{\circ}K)$ Per IGBT, $\lambda_{grease} = 3.4W/(m^{\circ}K)$		R_{thJH}		0.19		K/W
最高结温 $T_{vi\ max}$			$T_{vj\ max}$	175			$^{\circ}C$

Diode/ D1&D4

表 9 最大标定值/Maximum rated values

Parameter	Conditions	Symbol	Value	Unit
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	$T_H = 80^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	I_F	152	A
总耗散功率 Total Power dissipation	$T_H = 80^{\circ}\text{C}, T_{vj} = T_{vj\max}$	P_{tot}	365	W
正向重复峰值电流 Repetitive peak forward current	t_p limited by $T_{vj\max}$	I_{FRM}	800	A

表 10 特征值/Characteristic values

Parameter	Conditions		Symbol	Value			Unit
				Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F = 400\text{A}, V_{GE} = 0\text{V}$	$T_{vj} = 25^{\circ}\text{C}$	$*V_F$		1.77		V
		$T_{vj} = 125^{\circ}\text{C}$			2.36		
		$T_{vj} = 150^{\circ}\text{C}$			2.65		
	$I_F = 600\text{A}, V_{GE} = 0\text{V}$	$T_{vj} = 25^{\circ}\text{C}$			2.24		
		$T_{vj} = 125^{\circ}\text{C}$			3.29		
		$T_{vj} = 150^{\circ}\text{C}$			3.68		
反向恢复时间 Reverse recovery time		$T_{vj} = 25^{\circ}\text{C}$	t_{rr}		23		ns
		$T_{vj} = 125^{\circ}\text{C}$			26		
		$T_{vj} = 150^{\circ}\text{C}$			28		
反向恢复峰值电流 Peak reverse recovery current	$V_R = 600\text{V}$ $I_F = 400\text{A}$ $V_{GE} = -8\text{V}$	$T_{vj} = 25^{\circ}\text{C}$	I_{RM}		42		A
		$T_{vj} = 125^{\circ}\text{C}$			48		
		$T_{vj} = 150^{\circ}\text{C}$			50		
反向恢复电荷 Recovered charge	$R_{Gon} = 5.1\Omega$ $L_s = 30\text{nH}$ Inductive Load	$T_{vj} = 25^{\circ}\text{C}$	Q_r		0.8		μC
		$T_{vj} = 125^{\circ}\text{C}$			1.2		
		$T_{vj} = 150^{\circ}\text{C}$			1.8		
反向恢复损耗（每脉冲） Reverse recovery energy		$T_{vj} = 25^{\circ}\text{C}$	E_{rec}		0.10		mJ
		$T_{vj} = 125^{\circ}\text{C}$			0.19		
		$T_{vj} = 150^{\circ}\text{C}$			0.25		
结—散热器热阻 Thermal resistance, junction to heatsink	每个二极管, $\lambda_{grease} = 3.4\text{W}/(\text{m}^{\circ}\text{K})$ Per diode, $\lambda_{grease} = 3.4\text{W}/(\text{m}^{\circ}\text{K})$		R_{thJH}		0.26		K/W
最高结温 $T_{vj\max}$			$T_{vj\max}$	175			$^{\circ}\text{C}$

Diode/ D2&D3

表 11 最大标定值/Maximum rated values

Parameter	Conditions	Symbol	Value	Unit
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	$T_H = 80^{\circ}\text{C}, T_{vj\max} = 175^{\circ}\text{C}$	I_F	285	A
总耗散功率 Total Power dissipation	$T_H = 80^{\circ}\text{C}, T_{vj} = T_{vj\max}$	P_{tot}	413	W
正向重复峰值电流 Repetitive peak forward current	t_p limited by $T_{vj\max}$	I_{FRM}	800	A

表 12 特征值/Characteristic values

Parameter	Conditions		Symbol	Value			Unit
				Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F = 400\text{A}, V_{GE} = 0\text{V}$	$T_{vj} = 25^{\circ}\text{C}$	$*V_F$		2.36		V
		$T_{vj} = 125^{\circ}\text{C}$			2.28		
		$T_{vj} = 150^{\circ}\text{C}$			2.21		
	$I_F = 600\text{A}, V_{GE} = 0\text{V}$	$T_{vj} = 25^{\circ}\text{C}$			3.20		
		$T_{vj} = 125^{\circ}\text{C}$			3.22		
		$T_{vj} = 150^{\circ}\text{C}$			3.15		
结—散热器热阻 Thermal resistance, junction to heatsink	每个二极管, $\lambda_{grease} = 3.4\text{W}/(\text{m}^{\circ}\text{K})$ Per diode, $\lambda_{grease} = 3.4\text{W}/(\text{m}^{\circ}\text{K})$		R_{thJH}		0.23		K/W
最高结温 $T_{vj\max}$			$T_{vj\max}$	175			$^{\circ}\text{C}$

*Value at chip level

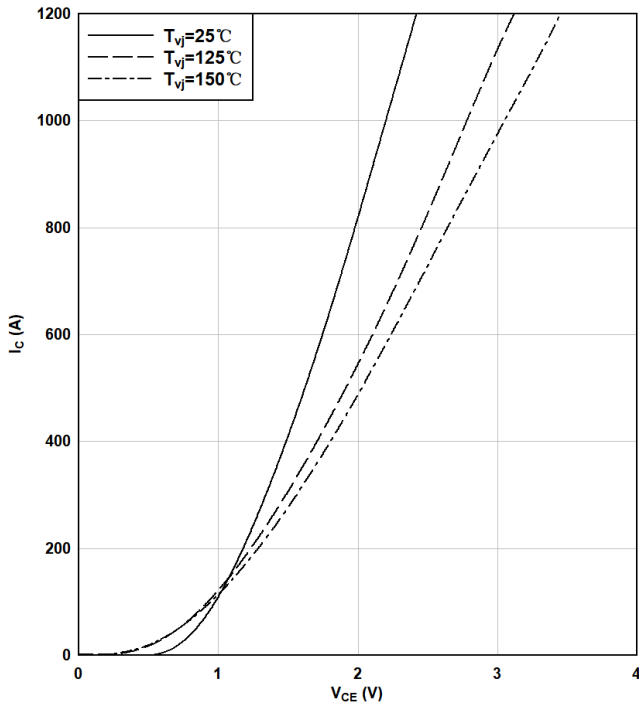
负温度系数热敏电阻/NTC-Thermistor

表 13 特征值/Characteristic values

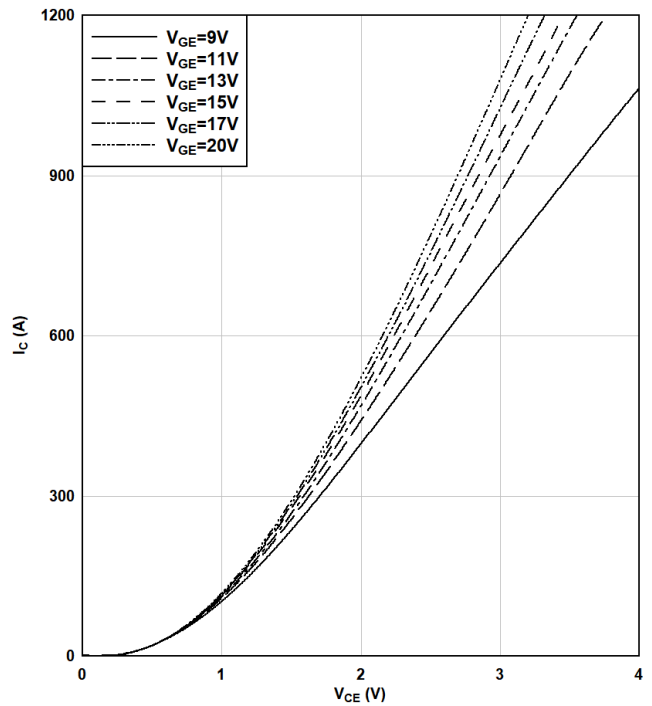
Parameter	Conditions	Symbol	Value	Unit
额定电阻值 Rated resistance	$T_{NTC} = 25^{\circ}\text{C}$	R_{25}	5	k Ω
R ₁₀₀ 偏差 Deviation of R_{100}	$T_{NTC} = 100^{\circ}\text{C}, R_{100} = 493\Omega$	$\Delta R/R$	± 5	%
耗散功率 Power dissipation	$T_{NTC} = 25^{\circ}\text{C}$	P_{25}	20.0	mW
B-值 B-value	$R_2 = R_{25} \exp[B_{25/50}(1/T_2 - 1/(298,15\text{K}))]$	$B_{25/50}$	3375	K
B-值 B-value	$R_2 = R_{25} \exp[B_{25/100}(1/T_2 - 1/(298,15\text{K}))]$	$B_{25/100}$	3433	K

特征参数图表/Characteristics Diagrams

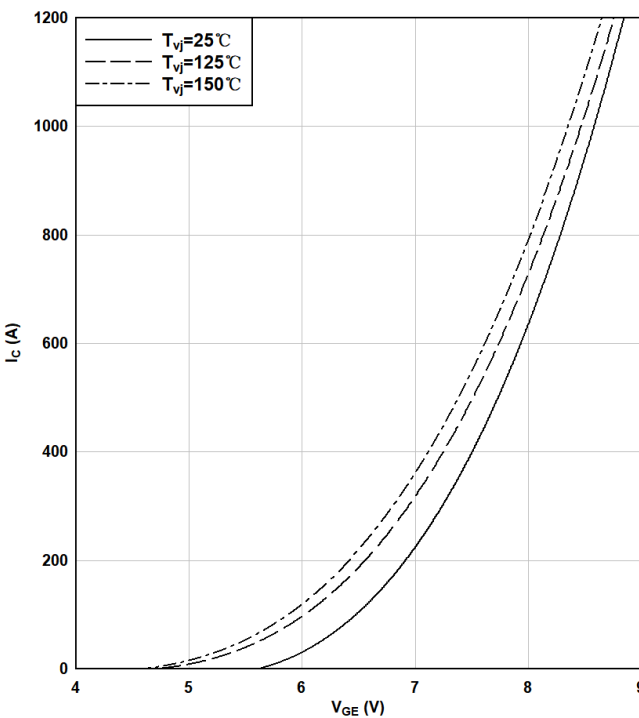
输出特性（典型），IGBT (T1/T4), 逆变器
Output characteristic (typical), IGBT(T1/T4), Inverter
 $I_C = f(V_{CE})$
 $V_{GE} = 15V$



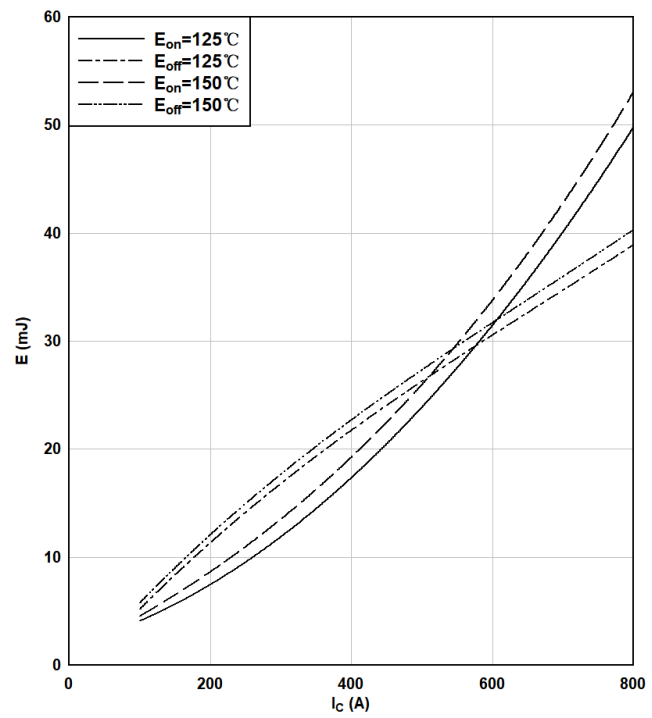
输出特性（典型），IGBT(T1/T4), 逆变器
Output characteristic field (typical), IGBT(T1/T4), Inverter
 $I_C = f(V_{CE})$
 $T_{vj} = 150^\circ C$



传输特性（典型），IGBT(T1/T4), 逆变器
Transfer characteristic (typical), IGBT(T1/T4), Inverter
 $I_C = f(V_{GE})$
 $V_{CE} = 20V$

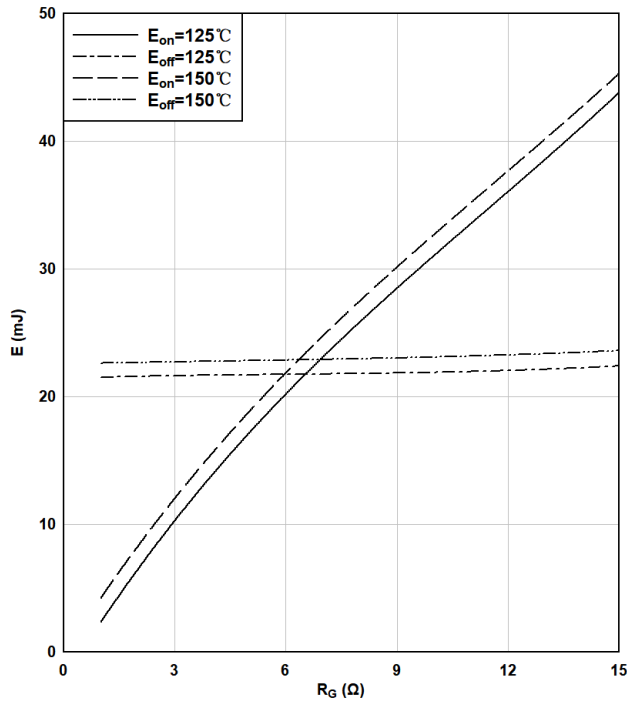


开关损耗（典型），IGBT(T1/T4), 逆变器
Switching losses (typical), IGBT(T1/T4), Inverter
 $E = f(I_C)$
 $V_{CE} = 600V$, $R_{Gon} = 5.1\Omega$, $R_{Goff} = 2.0\Omega$, $V_{GE} = +15/-8V$

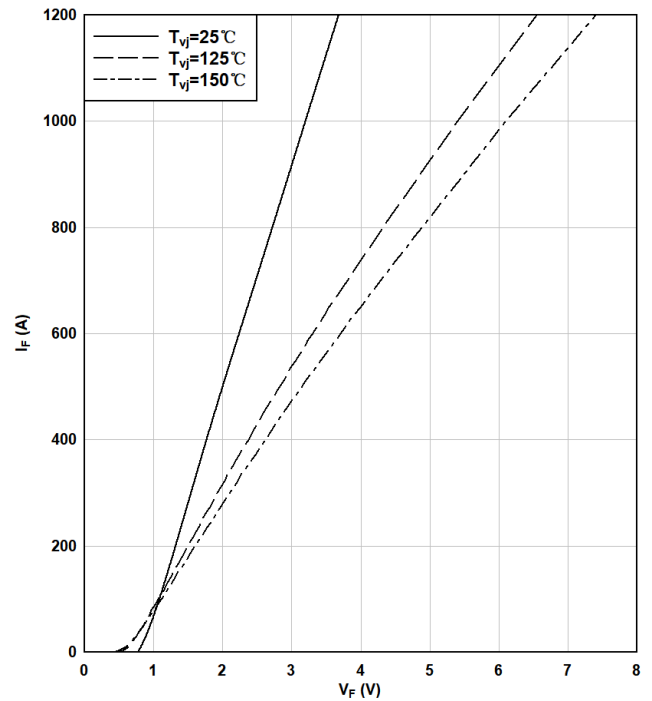


(续) 特征参数图表/Characteristics Diagrams

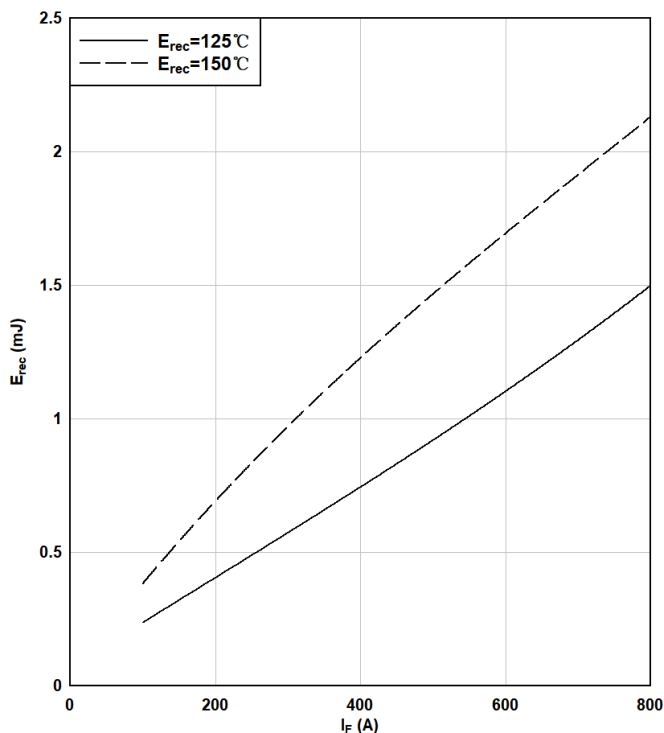
开关损耗 (典型), IGBT(T1/T4), 逆变器
Switching losses (typical), IGBT(T1/T4), Inverter
 $E = f(R_G)$
 $I_C = 400A$, $V_{CE} = 600V$, $V_{GE} = +15/-8V$



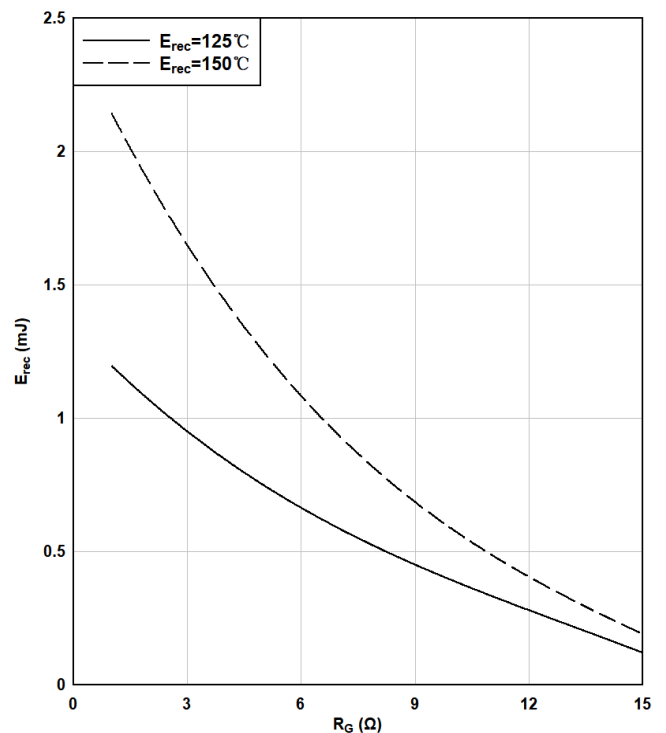
正向特性 (典型), 二极管(D5/D6)
Forward characteristic (typical), Diode(D5/D6)
 $I_F = f(V_F)$



开关损耗 (典型), 二极管(D5/D6)
Switching losses (typical), Diode(D5/D6)
 $E_{rec} = f(I_F)$
 $V_{CE} = 600V$, $R_{Gon} = 5.1Ω$

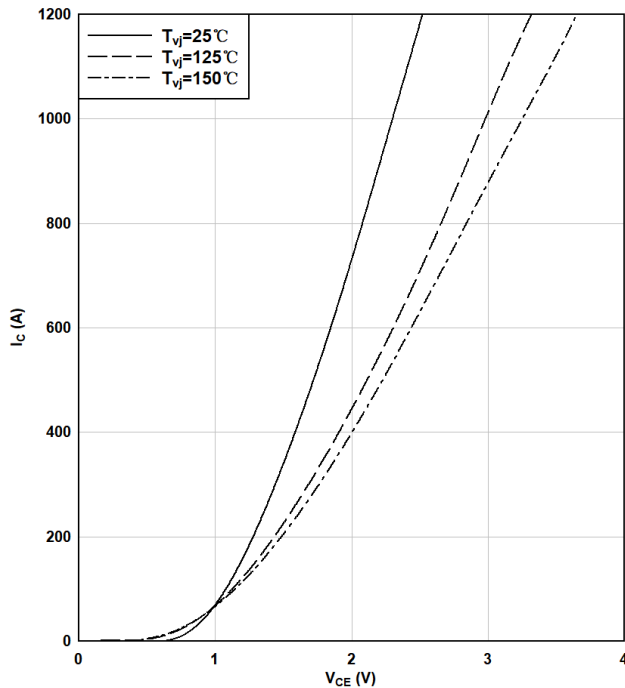


开关损耗 (典型), 二极管(D5/D6)
Switching losses (typical), Diode(D5/D6)
 $E_{rec} = f(R_G)$
 $I_F = 400A$, $V_{CE} = 600V$

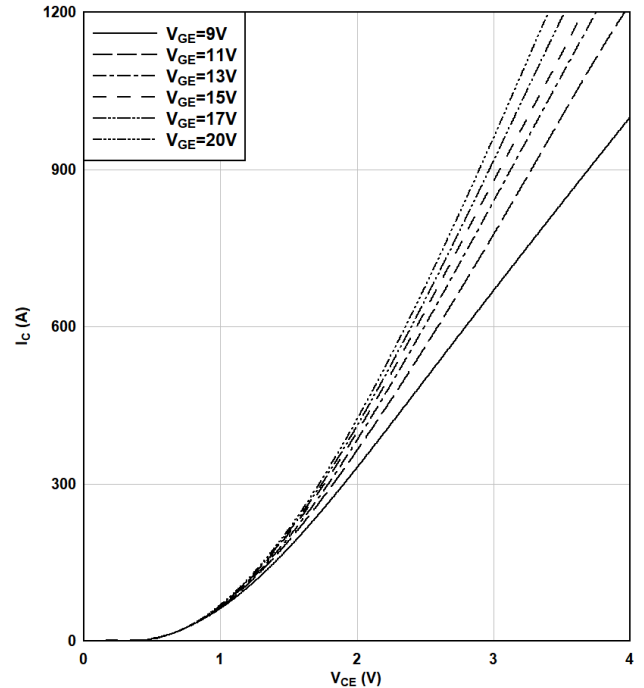


(续) 特征参数图表/Characteristics Diagrams

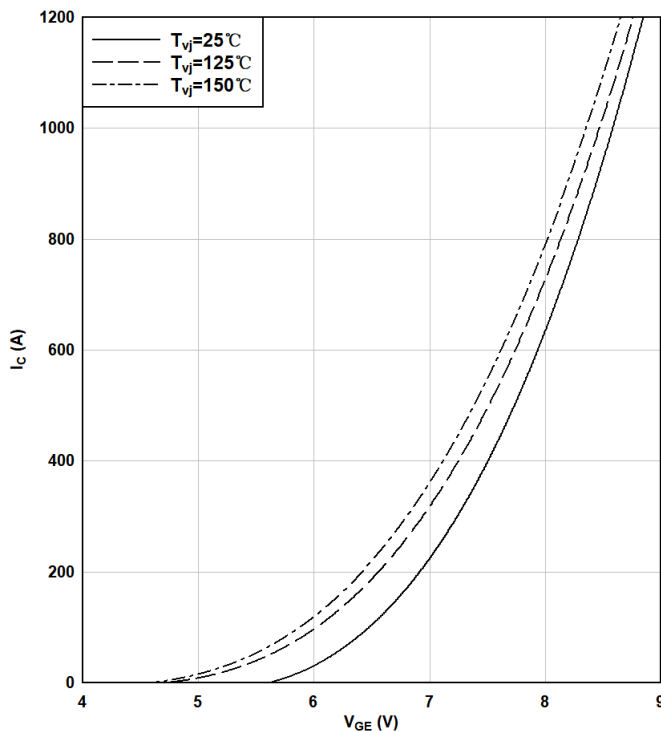
输出特性 (典型), IGBT (T2/T3), 逆变器
Output characteristic (typical), IGBT(T2/T3), Inverter
 $I_C = f(V_{CE})$
 $V_{GE} = 15V$



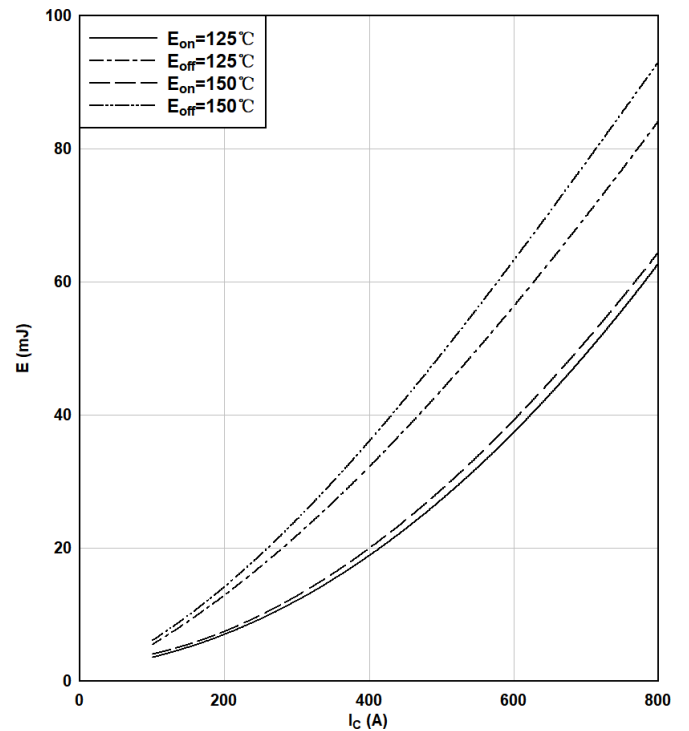
输出特性 (典型), IGBT (T2/T3), 逆变器
Output characteristic field (typical), IGBT(T2/T3), Inverter
 $I_C = f(V_{CE})$
 $T_{vj} = 150^\circ C$



传输特性 (典型), IGBT (T2/T3), 逆变器
Transfer characteristic (typical), IGBT(T2/T3), Inverter
 $I_C = f(V_{GE})$
 $V_{CE} = 20V$

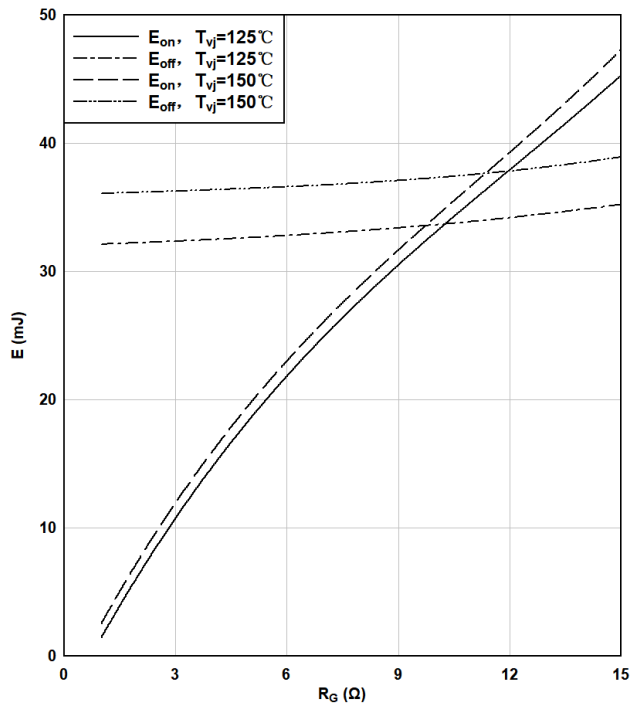


开关损耗 (典型), IGBT (T2/T3), 逆变器
Switching losses (typical), IGBT(T2/T3), Inverter
 $E = f(I_C)$
 $V_{CE} = 600V$, $R_{Gon} = 5.1\Omega$, $R_{Goff} = 2.0\Omega$, $V_{GE} = +15/-8V$

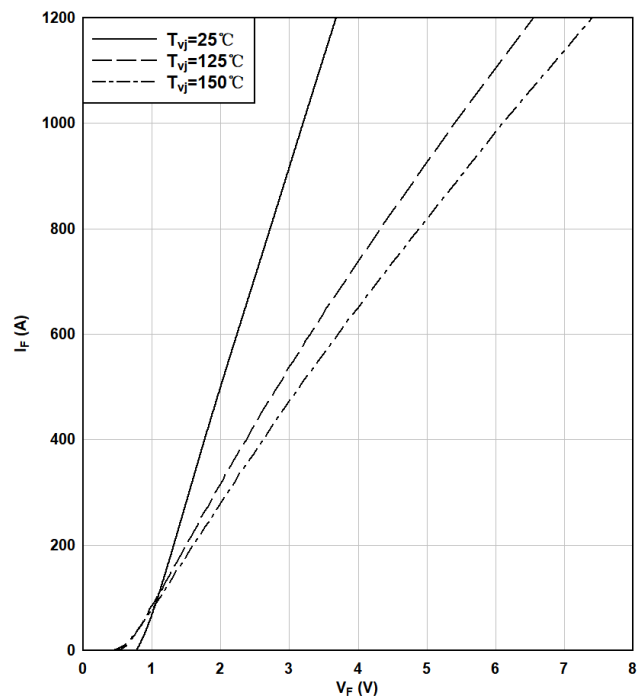


(续) 特征参数图表/Characteristics Diagrams

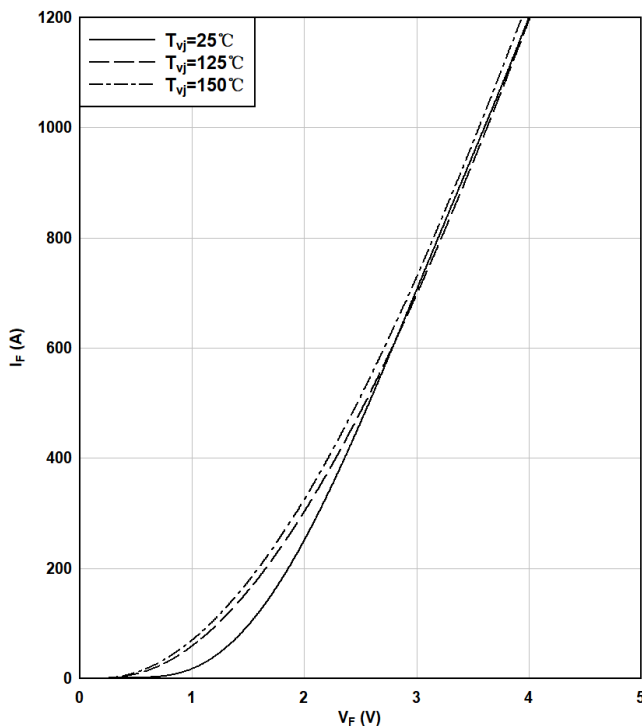
开关损耗 (典型), IGBT(T2/T3)逆变器
Switching losses (typical), IGBT(T2/T3), Inverter
 $E = f(R_G)$
 $I_C = 400A$, $V_{CE} = 600V$, $V_{GE} = +15/-8V$



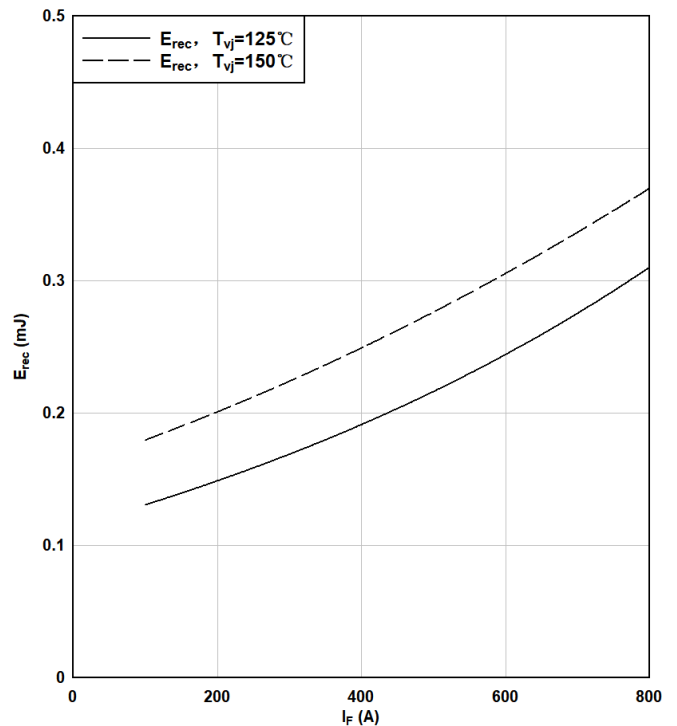
正向特性 (典型), 二极管(D1/D4)
Forward characteristic (typical), Diode(D1/D4)
 $I_F = f(V_F)$



正向特性 (典型), 二极管(D2/D3)
Forward characteristic (typical), Diode(D2/D3)
 $I_F = f(V_F)$

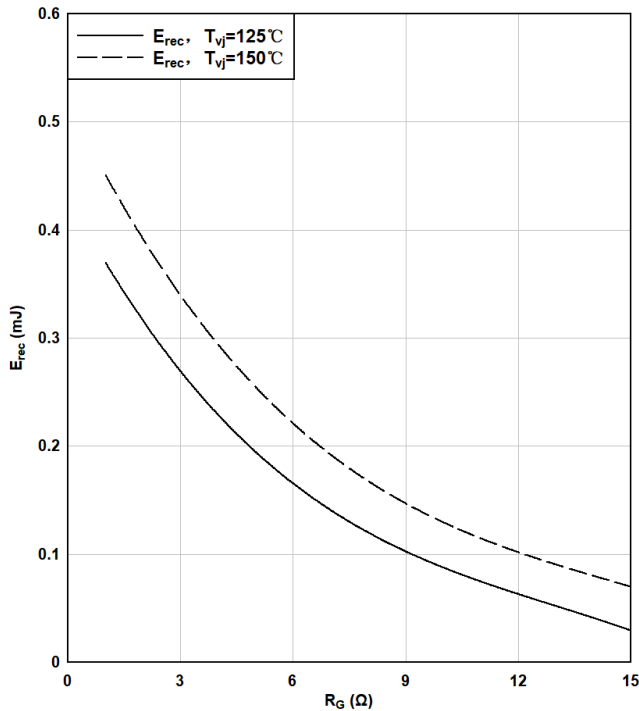


开关损耗 (典型), 二极管(D1/D4)
Switching losses (typical), Diode(D1/D4)
 $E_{rec} = f(I_F)$
 $V_{CE} = 600V$, $R_{Gon} = 5.1\Omega$

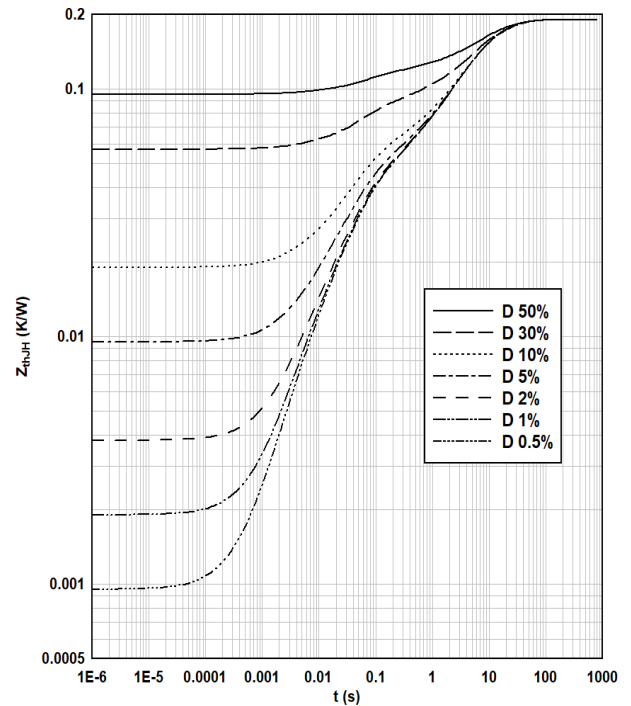


(续) 特征参数图表/Characteristics Diagrams

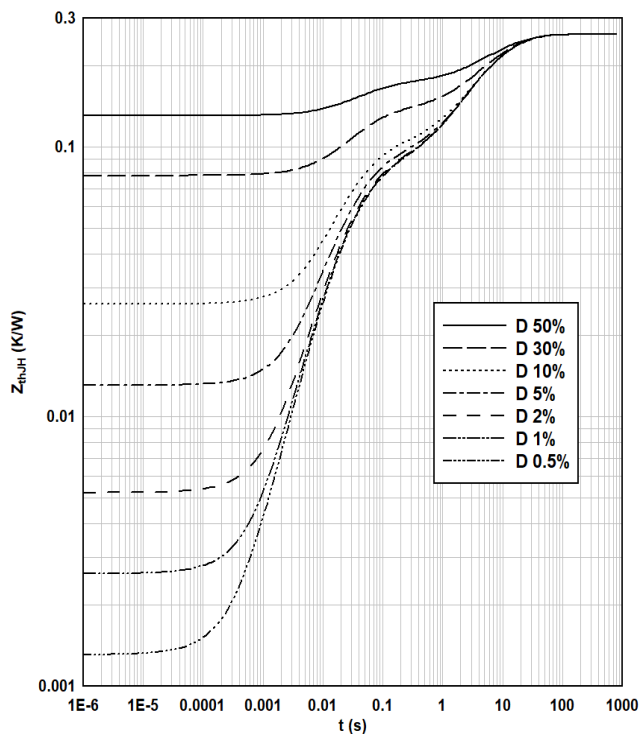
开关损耗 (典型), 二极管(D1/D4)
Switching losses (typical), Diode(D1/D4)
 $E_{rec} = f(R_G)$
 $I_F = 400A, V_{CE} = 600V$



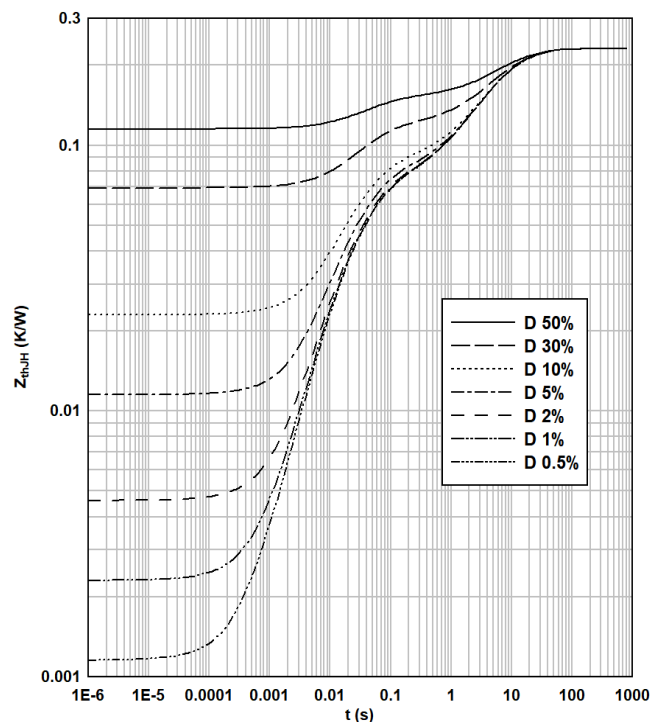
瞬态热阻抗, IGBT(T1/T2/T3/T4)
Transient thermal impedance, IGBT(T1/T2/T3/T4)
 $Z_{thJH} = f(t)$



瞬态热阻抗, 二极管(D1/D4/D5/D6)
Transient thermal impedance, Diode (D1/D4/D5/D6)
 $Z_{thJH} = f(t)$



瞬态热阻抗, 二极管(D2/D3)
Transient thermal impedance, Diode (D2/D3)
 $Z_{thJH} = f(t)$

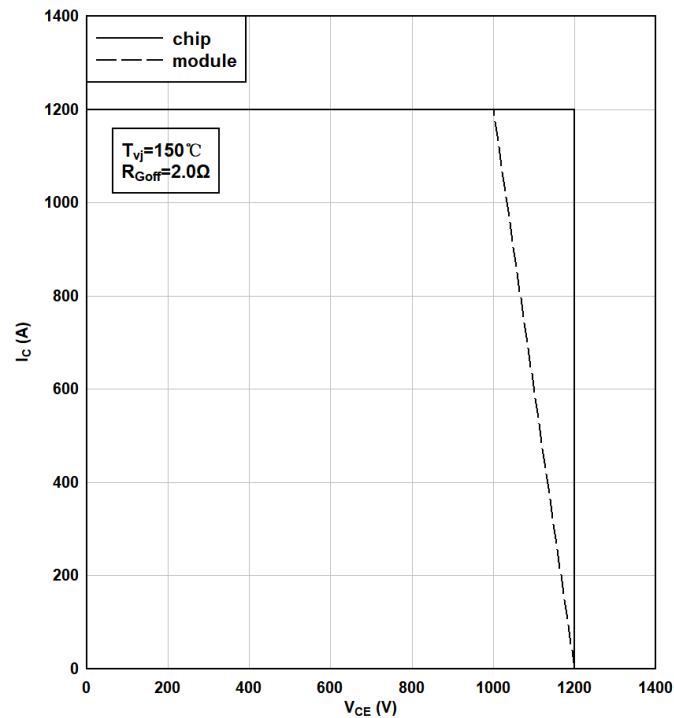


(续) 特征参数图表/Characteristics Diagrams

反偏安全工作区 IGBT, 逆变器 (T1/T4)

Reverse bias safe operating area IGBT, Inverter(T1/T4)

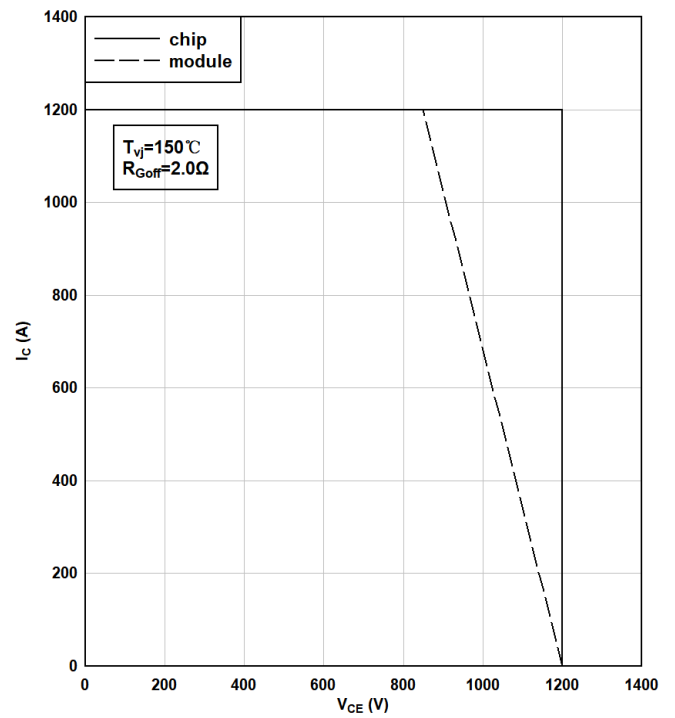
$I_C = f(V_{CE})$



反偏安全工作区 IGBT, 逆变器 (T2/T3)

Reverse bias safe operating area IGBT, Inverter(T2/T3)

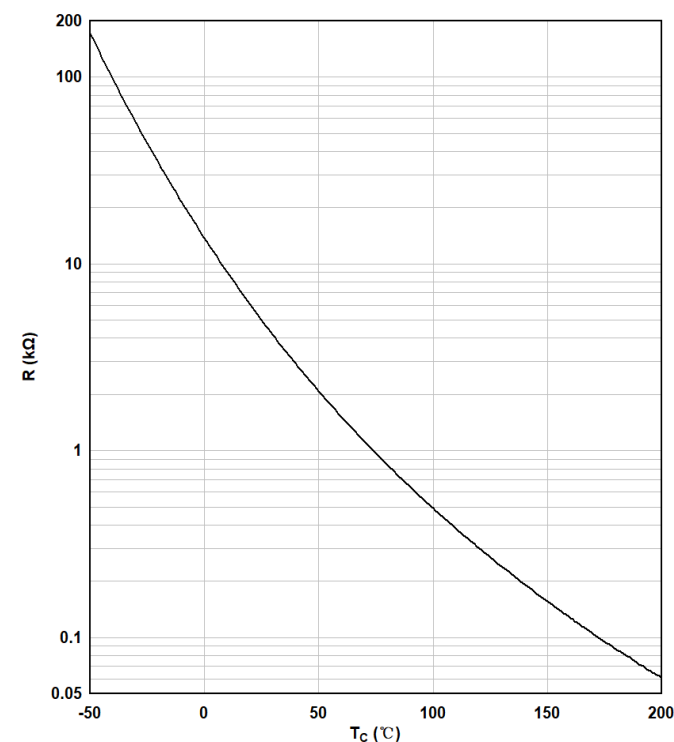
$I_C = f(V_{CE})$



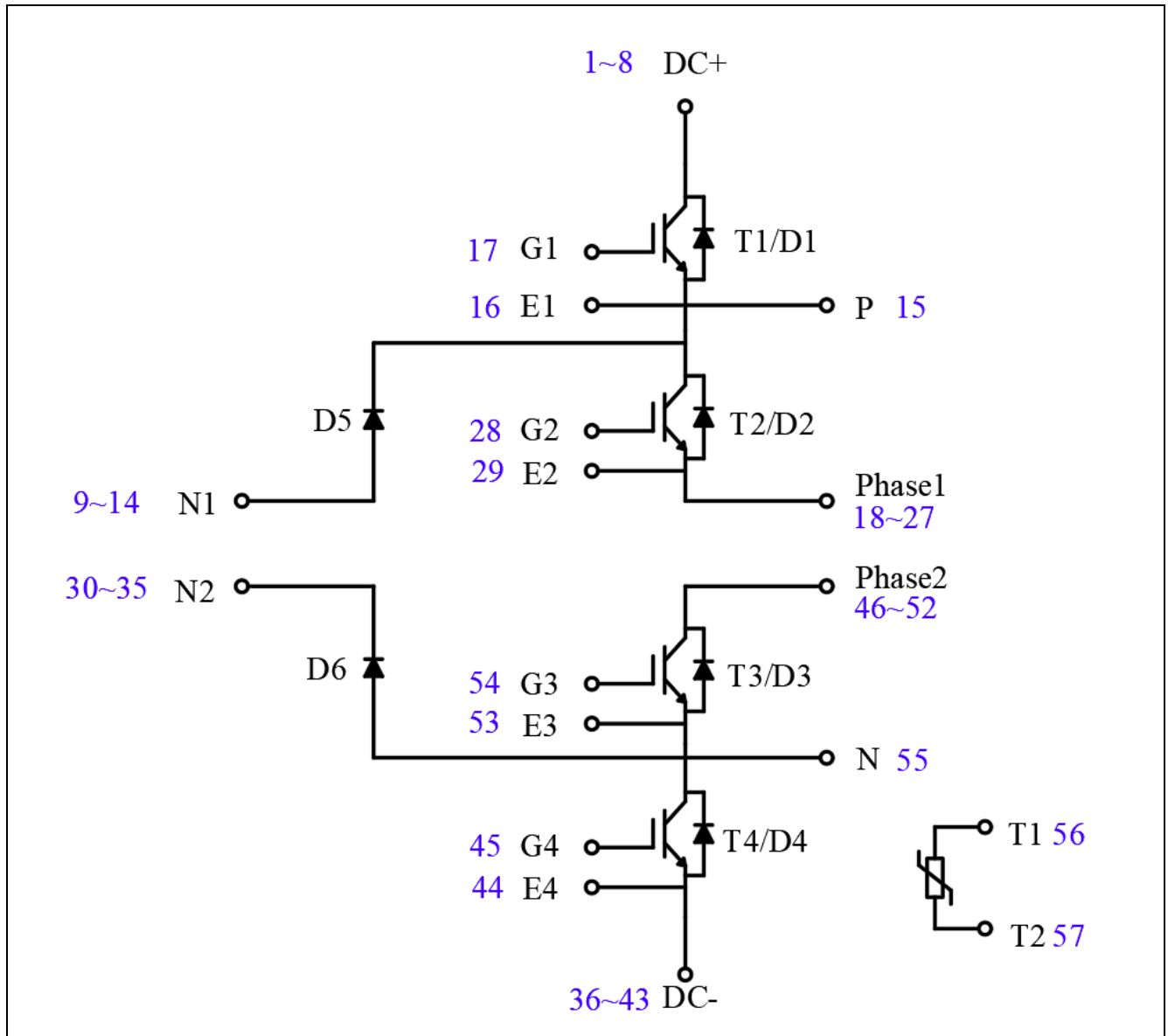
负温度系数热敏电阻温度特性

NTC-Thermistor-temperature characteristic(typical)

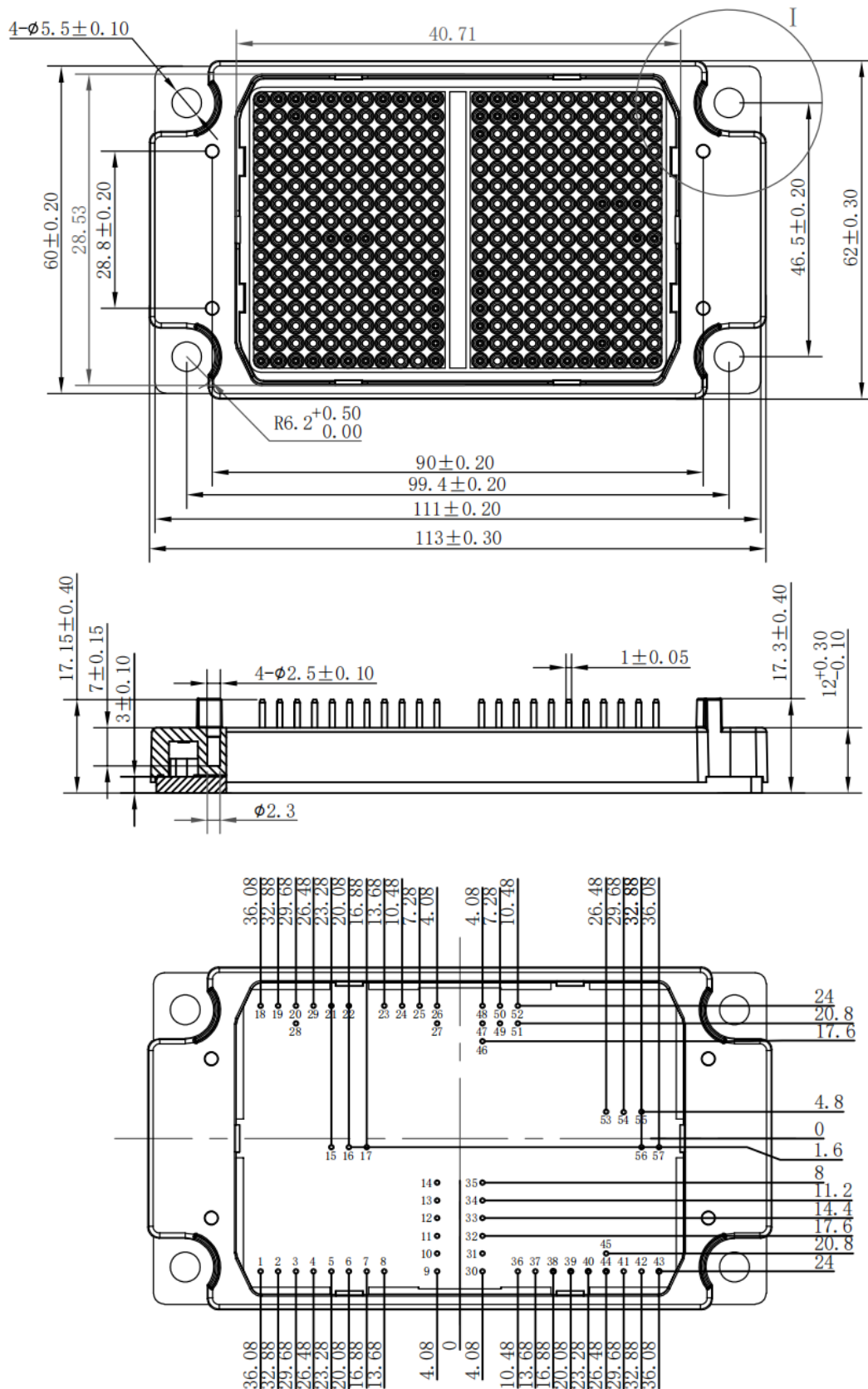
$R = f(T_C)$

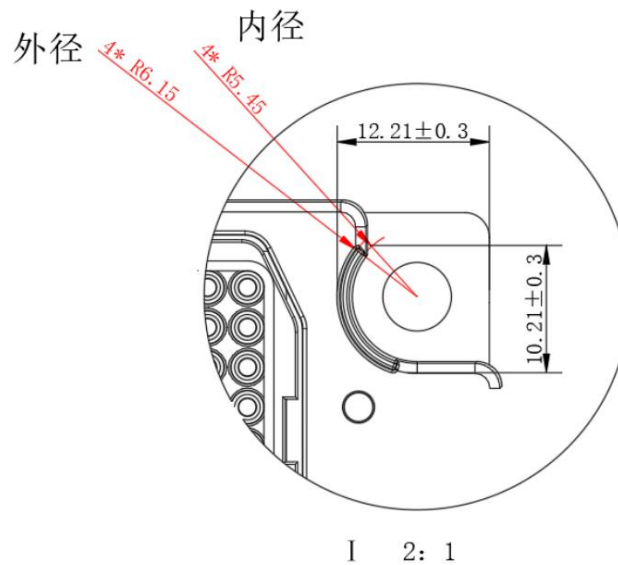


电路拓扑图 / Circuit Diagram



封装尺寸 / Package Outlines





模块标签信息/ Module Marking Information

Marking Diagram

AMG600L12P4H7RM = Specific Device

P4CQ22420010001 = Lot Traceability

ACP-3S = Package Type

声明与使用条件/ Notices and conditions of use

1. 阿基米德保留手册的更改权；

Archimedes reserves the right to change the manual;

2. 本手册中提供的数据一部分为产品的典型值，实际出厂测试的数据与典型值略有差异，但我司保证这些差异不会影响产品的正常使用，如果产品信息发生变更，我司会及时更新手册，请随时关注；

Part of the data provided in this manual is the typical value of the product, the actual factory test data and the typical value are slightly different, but our company guarantees that these differences will not affect the normal use of the product, if the product information changes, our company will update the manual in time, please pay attention at any time;

3. 在应用我司产品时请不要超过产品的最大额定值，否则我司无法保证产品应用的可靠性；

When applying our products, please do not exceed the maximum rating of the product, otherwise our

company can not guarantee the reliability of the product application;

4. 产品在使用时，严禁触碰，断电后确认无残余电荷且产品已完全冷却后，才可以在有静电防护措施下触碰产品；

When the product is in use, it is strictly forbidden to touch the product. After power off, it is confirmed that there is no residual charge and the product has been completely cooled, and it can only be touched under electrostatic protection measures;

5. 购买产品时请认准我司商标，如有疑问请与本司联系。

Please look for our trademark when purchasing products. If you have any questions, please contact us.