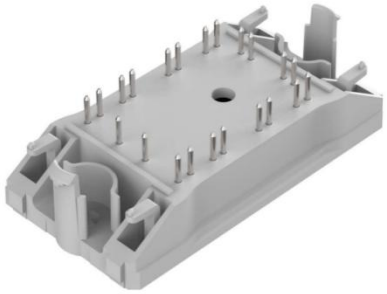
合肥中恒微半导体有限公司
HeFei Cpower Technology,Ltd.
TLM75M07S1P

➢ 产品外观 / Appearance



V_{CES} = 650V

$I_{C\ nom}$ = 75A / I_{CRM} = 150A

➢ 特性 / Features

A. 高能效	A. High-efficiency
B. 高开关频率	B. Ultra-fast switching frequency
C. 低杂散电感布局	C. Low Inductive Layout

➢ 用途 / Applications

A. 光伏逆变器	A. Solar Inverters
B. 不间断电源	B. Uninterruptible Power Supplies Systems
C. 三电平应用	C. 3-Level-Applications

➢ 相关信息 / Related Information

条形码 / Barcode Code

二维码 / DMX – Code

公司地址：合肥市高新区创新大道与明珠大道交叉口 106 号 5 号楼 2 层 C 区、D 区。

Address：Area C and D, 2nd floor, Building 5, No. 106, Intersection of Innovation Avenue and Mingzhu Avenue, High-tech Zone, Hefei City.

TLM75M07S1P

降压 IGBT/ Buck IGBT

最大额定值/ Maximum Rated Values

集电极-发射极电压 Collector–Emitter voltage	T_J=25℃	V_{CES}	650	V
连续集电极直流电流 Continuous DC collector current	T_C = 100℃, T_j max = 175℃	$I_{c\ nom}$	75	A
集电极重复峰值电流 Repetitive peak collector current	T_P=1ms	I_{CRM}	150	A
栅极-发射极峰值电压 Gate-emitter peak voltage		V_{GES}	+/-20	V

电特性/ Electrical Characteristics (T_j = 25℃ unless otherwise noted)

Parameter	Test Conditions		Symbol	Min	Typ	Max	Unit
集电极-发射极饱和电压 Collector-emitter saturation voltage	I_C = 75 A, V_{GE} = 15 V	T_j = 25℃ T_j = 125℃ T_j = 150℃	$V_{CE(sat)}$		1.45 1.65 1.70		V
栅极阈值电压 Gate threshold voltage	I_C = 4mA, V_{CE} = V_{GE}, T_j = 25℃		V_{GEth}		5.80		V
栅极电荷/Gate charge	V_{GE} = -15V … +15 V		Q_G		0.45		µC
内部栅极电阻 Internal gate resistor	T_j = 25℃		R_{Gint}		None		Ω
输入电容/Input capacitance	f = 1 MHz, V_{CE} = 25 V, V_{GE} = 0 V		C_{ies}		3.0		nF
反向传输电容 Reverse transfer capacitance			C_{res}		0.01		
集电极-发射极截止电流 Collector–Emitter Cut-off Current	V_{CE} = 650 V, V_{GE} = 0 V		I_{CES}			40	mA
栅极峰值电流 Gate Leakage Current	V_{CE} = 0 V, V_{GE} = 20 V		I_{GES}			120	nA
开通延迟时间 Turn–on Delay Time	I_C = 75 A, V_{CE} = 300 V V_{GE} = ±15 V R_G = 2 Ω Inductive Load Turn-on(T_j = 150℃): di/dt = 3370 A/µs Turn-off(T_j = 150℃): dv/dt = 4940 V/µs	T_J = 25℃ T_J = 125℃ T_J = 150℃	$t_{d(on)}$		10 15 20		ns
上升时间 Rise Time		T_J = 25℃ T_J = 125℃ T_J = 150℃	t_r		5 10 15		
关断延迟时间 Turn–off Delay Time		T_J = 25℃ T_J = 125℃ T_J = 150℃	$t_{d(off)}$		105 110 115		
下降时间 Fall Time		T_J = 25℃ T_J = 125℃ T_J = 150℃	t_f		85 90 95		
开通损耗能量 Turn–on Switching Loss per Pulse		T_J = 25℃ T_J = 125℃ T_J = 150℃	E_{on}		0.15 0.20 0.25		mJ
关断损耗能量 Turn off Switching Loss per Pulse		T_J = 25℃ T_J = 125℃ T_J = 150℃	E_{off}		0.45 0.55 0.60		
芯片 – 外壳热阻 Thermal Resistance – chip–to–case	每个 IGBT / per IGBT		R_{thJC}		0.191		K/W
开关状态下温度 Temperature under switching			$T_{j\ op}$	-40		150	℃

TLM75M07S1P

降压二极管 / Buck Diode

降压二极管 / Buck Diode

最大额定值/Maximum Rated Values

反向重复峰值电压 Repetitive peak reverse voltage	T_j = 25℃	V_{RRM}	650	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 ms	I_{FRM}	150	A

电特性 / Electrical Characteristics (T_J = 25℃, unless otherwise noted)

Parameter	Test Conditions		Symbol	Min	Typ	Max	Unit
二极管正向电压 Diode Forward Voltage	I_F = 75 A, V_{GE} = 0 V	T_J = 25℃ T_J = 125℃ T_J = 150℃	V_F		1.35 1.40 1.45		V
二极管正向电压 Diode Forward Voltage	I_F = 75 A, V_R = 600 V V_{GE} = -15 V -di_F/dt =1940 A/μs	T_J = 25℃ T_J = 125℃ T_J = 150℃	I_{RRM}		75 80 85		A
反向恢复峰值电流 Peak Reverse Recovery Current		T_J = 25℃ T_J = 125℃ T_J = 150℃	Q_{rr}		2.5 4.0 4.5		uC
反向恢复能量 Reverse Recovery Energy		T_J = 25℃ T_J = 125℃ T_J = 150℃	E_{rec}		0.40 0.90 1.00		mJ
芯片 – 外壳热阻 Thermal Resistance – chip–to–case	Thickness = 2 Mil ±2%, λ= 2.8 W/mK		R_{thJC}		0.247		℃/W
开关状态下温度 Temperature under switching			$T_{j\,op}$	-40		150	℃

TLM75M07S1P

升压 IGBT/ Boost IGBT

最大额定值/ Maximum Rated Values

集电极-发射极电压 Collector−Emitter voltage	T_J=25℃	V_{CES}	650	V
连续集电极直流电流 Continuous DC collector current	T_C = 100℃, T_j max = 175℃	$I_{c\ nom}$	75	A
集电极重复峰值电流 Repetitive peak collector current	T_P=1ms	I_{CRM}	150	A
栅极-发射极峰值电压 Gate-emitter peak voltage		V_{GES}	+/-20	V

电特性/ Electrical Characteristics (T_J = 25℃ unless otherwise noted)

Parameter	Test Conditions		Symbol	Min	Typ	Max	Unit
集电极-发射极饱和电压 Collector-emitter saturation voltage	I_C = 75 A, V_{GE} = 15 V	T_j = 25℃ T_j = 125℃ T_j = 150℃	$V_{CE(sat)}$		1.45 1.65 1.70		V
栅极阈值电压 Gate threshold voltage	I_C = 4mA, V_{CE} = V_{GE}, T_j = 25℃		V_{GEth}		5.80		V
栅极电荷/Gate charge	V_{GE} = -15V … +15 V		Q_G		0.45		µC
内部栅极电阻 Internal gate resistor	T_j = 25℃		R_{Gint}		None		Ω
输入电容/Input capacitance	f = 1 MHz, V_{CE} = 25 V, V_{GE} = 0 V		C_{ies}		3.0		nF
反向传输电容 Reverse transfer capacitance			C_{res}		0.01		
集电极-发射极截止电流 Collector−Emitter Cut-off Current	V_{CE} = 650 V, V_{GE} = 0 V		I_{CES}			40	mA
栅极峰值电流 Gate Leakage Current	V_{CE} = 0 V, V_{GE} = 20 V		I_{GES}			120	nA
开通延迟时间 Turn−on Delay Time	I_C = 75 A, V_{CE} = 300 V V_{GE} = ±15 V R_G = 2 Ω Inductive Load Turn-on(T_j = 150℃): di/dt = 3370 A/µs Turn-off(T_j = 150℃): dv/dt = 4940 V/µs	T_J = 25℃ T_J = 125℃ T_J = 150℃	$t_{d(on)}$		10 15 20		ns
上升时间 Rise Time		T_J = 25℃ T_J = 125℃ T_J = 150℃	t_r		5 10 15		
关断延迟时间 Turn−off Delay Time		T_J = 25℃ T_J = 125℃ T_J = 150℃	$t_{d(off)}$		105 110 115		
下降时间 Fall Time		T_J = 25℃ T_J = 125℃ T_J = 150℃	t_f		85 90 95		
开通损耗能量 Turn−on Switching Loss per Pulse		T_J = 25℃ T_J = 125℃ T_J = 150℃	E_{on}		0.15 0.20 0.25		mJ
关断损耗能量 Turn off Switching Loss per Pulse		T_J = 25℃ T_J = 125℃ T_J = 150℃	E_{off}		0.45 0.55 0.60		
芯片 – 外壳热阻 Thermal Resistance − chip−to−case	每个 IGBT / per IGBT		R_{thJC}		0.191		℃/W
开关状态下温度 Temperature under switching			$T_{j\ op}$	-40		150	℃

TLM75M07S1P

升压二极管 / Boost Diode
钳位二极管/ Clamp Diode

降压二极管 / Buck Diode

最大额定值/Maximum Rated Values

反向重复峰值电压 Repetitive peak reverse voltage	T_j = 25℃	V_{RRM}	650	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 ms	I_{FRM}	150	A

电特性 / Electrical Characteristics (T_J = 25℃, unless otherwise noted)

Parameter	Test Conditions		Symbol	Min	Typ	Max	Unit
二极管正向电压 Diode Forward Voltage	I_F = 75 A, V_{GE} = 0 V	T_J = 25℃ T_J = 125℃ T_J = 150℃	V_F		1.35 1.40 1.45		V
二极管正向电压 Diode Forward Voltage	I_F = 75 A, V_R = 600 V V_{GE} = -15 V -di$_F$/dt =1940 A/μs	T_J = 25℃ T_J = 125℃ T_J = 150℃	I_{RRM}		75 80 85		A
反向恢复峰值电流 Peak Reverse Recovery Current		T_J = 25℃ T_J = 125℃ T_J = 150℃	Q_{rr}		2.5 4.0 4.5		uC
反向恢复能量 Reverse Recovery Energy		T_J = 25℃ T_J = 125℃ T_J = 150℃	E_{rec}		0.40 0.90 1.00		mJ
芯片 – 外壳热阻 Thermal Resistance – chip–to–case	Thickness = 2 Mil ±2%, λ= 2.8 W/mK		R_{thJC}		0.247		℃/W
开关状态下温度 Temperature under switching			$T_{j\,op}$	-40		150	℃

钳位二极管 / Clamp Diode

最大额定值/Maximum Rated Values

反向重复峰值电压 Repetitive peak reverse voltage	T_j = 25℃	V_{RRM}	650	V
连续正向直流电流 Continuous DC forward current		I_F	75	A

特性 / Electrical Characteristics (T_J = 25℃, unless otherwise noted)

Parameter	Test Conditions		Symbol	Min	Typ	Max	Unit
二极管正向电压 Diode Forward Voltage	IF = 75 A	T_J = 25℃ T_J = 125℃ T_J = 150℃	V_F		1.35 1.40 1.45		V

TLM75M07S1P

负温度系数热敏电阻/NTC-Thermistor

特征值 / Characteristic Values			Min.	Typ.	Max.	
额定阻值 Rated resistance	TC = 25℃	R25		22		kΩ
阻值误差 Deviation of R100	TC = 100℃, R100 = 1468 Ω	ΔR/R	-5		5	%
功率损耗 Power dissipation	TC = 25℃	P25			200	mW
B 值/B – value	R2=R25 exp [B25/50(1/T2 – 1/(298.15K))]	B25/50		3950		K
B 值/B – value	R2=R25 exp [B25/100(1/T2 – 1/(298.15K))]	B25/100		3433		K

TLM75M07S1P

模块 / Module

绝缘配置 / Insulation Coordination

隔离试验电压 Isolation test voltage	RMS, f = 50 Hz, t = 1 min	V_{ISOL}	4.0	kV
模块基板材料 Material of module baseplate			Cu	
内部绝缘/Internal Isolation	基本绝缘 (class 1, IEC61140) Basic insulation (class 1, IEC61140)		Al_2O_3	
爬电距离/Creepage distance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal	dCreep	10.0	mm
间隙/Clearance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal	dClear	7.5	mm
相对漏电起痕指数 Comparative tracking index		CTI	> 200	

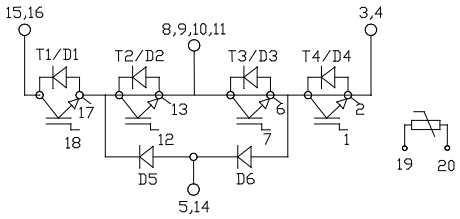
特征值 / Characteristic Values

			Min.	Typ.		
杂散电感，模块 Stray inductance module		L_{sCE}		20		nH
模块引线电阻 Module lead resistance	TC = 25℃, 每个开关 / per switch	$R_{CC' + EE}$		1.6		mΩ
储存温度/Storage temperature		T_{stg}	-40		125	℃
模块安装的安装扭距 Mounting torque for module mounting	螺丝 M5 / Screw M5	M	3.00		5.00	Nm
重量/Weight		G		188		g

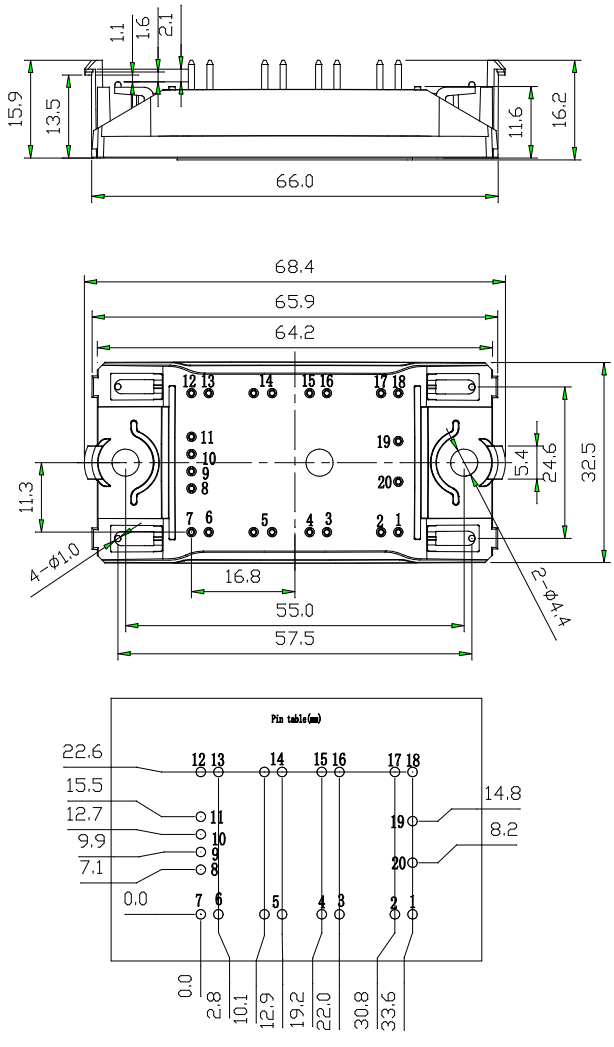
TLM75M07S1P

封装/Package

电路拓扑/Circuit Topology



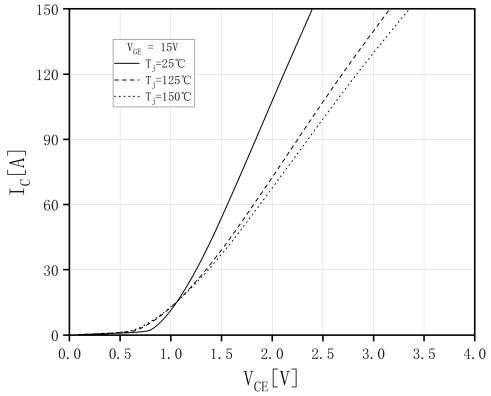
封装尺寸 / Package outlines



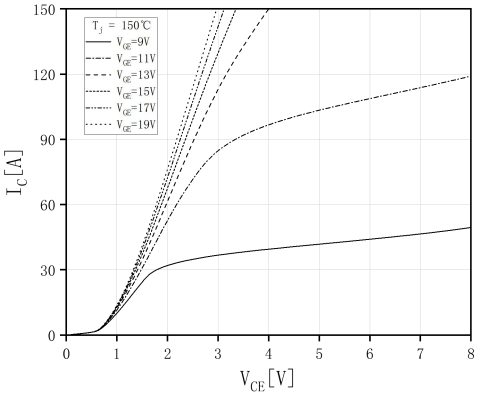
TLM75M07S1P

性能 / Performance

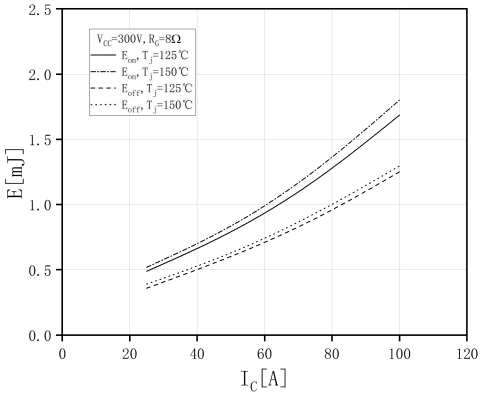
降压输出特性 IGBT, 逆变器（典型）
Buck output characteristic IGBT, Inverter (typical)



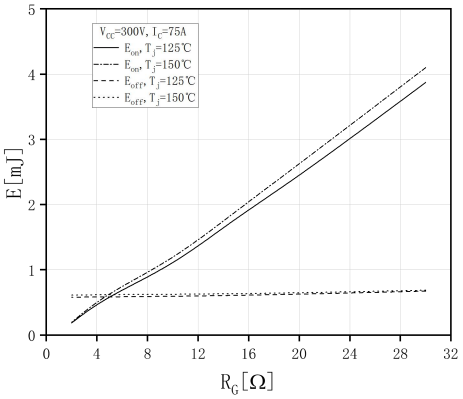
降压输出特性 IGBT, 逆变器（典型）
Buck output characteristic IGBT, Inverter (typical)



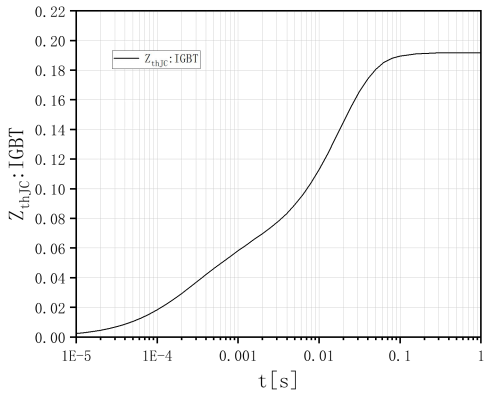
降压开关损耗 IGBT, 逆变器（典型）
Buck switching losses IGBT, Inverter (typical)



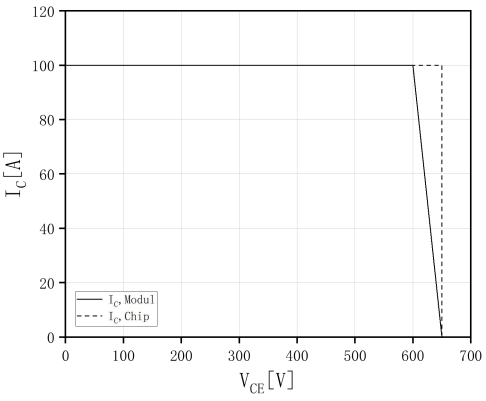
降压开关损耗 IGBT, 逆变器（典型）
Buck switching losses IGBT, Inverter (typical)



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



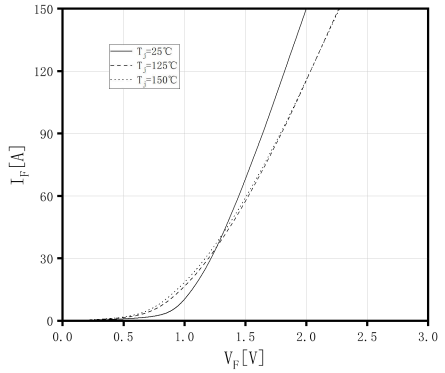
反偏安全工作区 IGBT, 逆变器（RBSOA）
Reverse bias safe operating area IGBT, Inverter(RBSOA)



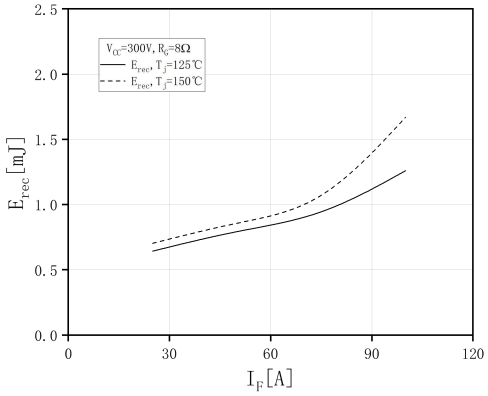
TLM75M07S1P

性能 / Performance

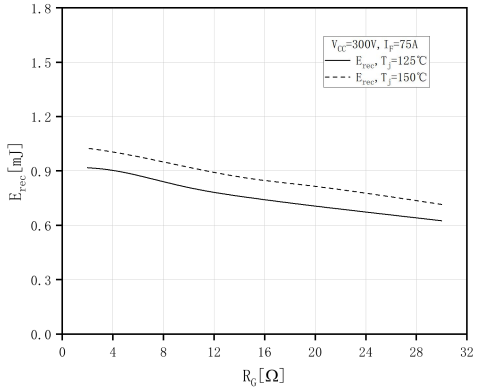
降压正向偏压特性 二极管,逆变器（典型）
Buck forward characteristic of Diode, Inverter(typical)



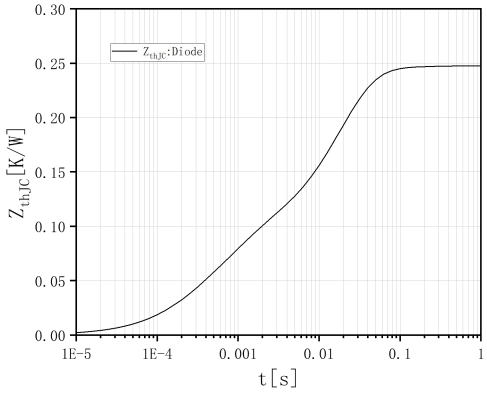
降压开关损耗 二极管, 逆变器（典型）
Buck switching losses Diode, Inverter(typical)



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



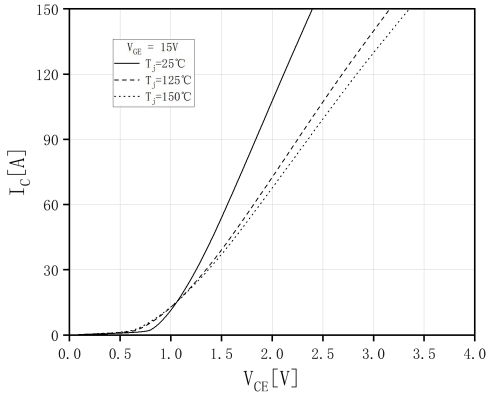
瞬态热阻抗 二极管, 逆变器
transient thermal impedance Diode, Inverter



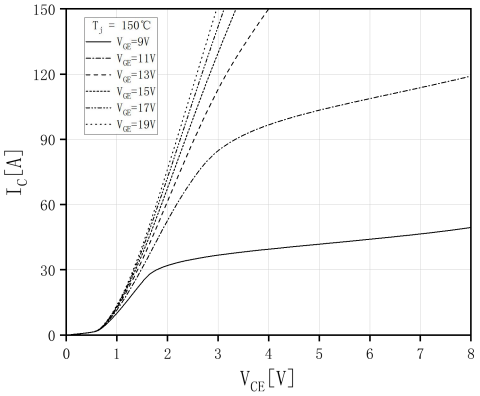
TLM75M07S1P

性能 / Performance

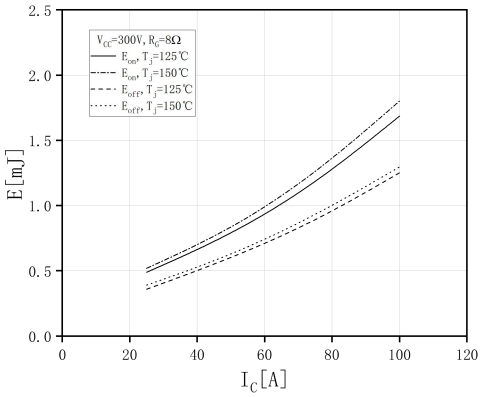
升压输出特性 IGBT, 逆变器（典型）
Boost output characteristic IGBT, Inverter (typical)



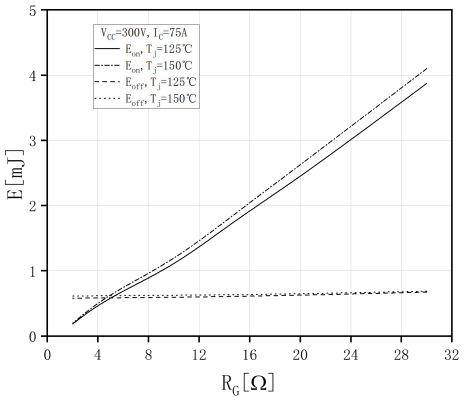
升压输出特性 IGBT, 逆变器（典型）
Boost output characteristic IGBT, Inverter (typical)



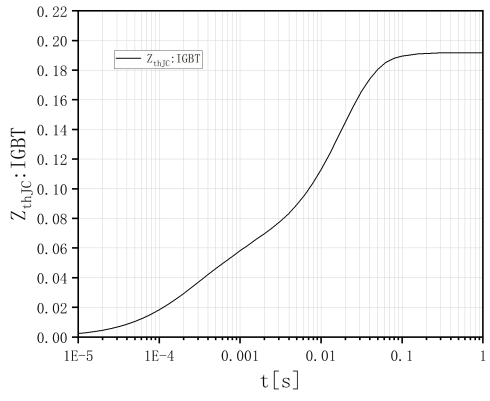
升压开关损耗 IGBT, 逆变器（典型）
Boost switching losses IGBT, Inverter (typical)



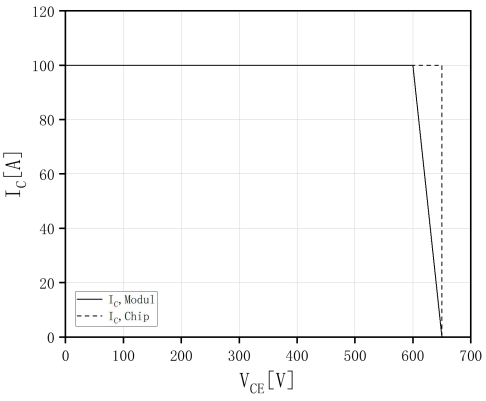
升压开关损耗 IGBT, 逆变器（典型）
Boost switching losses IGBT, Inverter (typical)



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



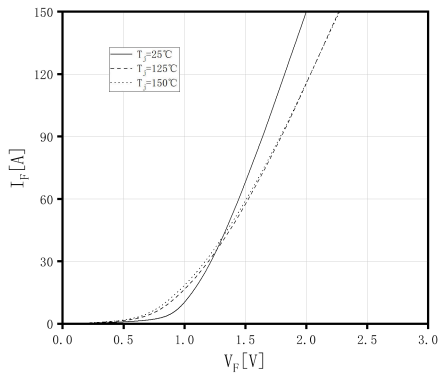
反偏安全工作区 IGBT, 逆变器（RBSOA）
Reverse bias safe operating area IGBT, Inverter(RBSOA)



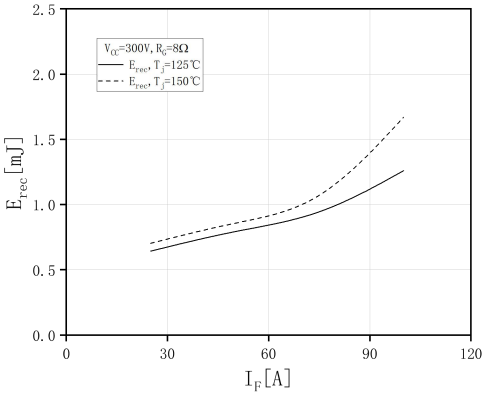
TLM75M07S1P

性能 / Performance

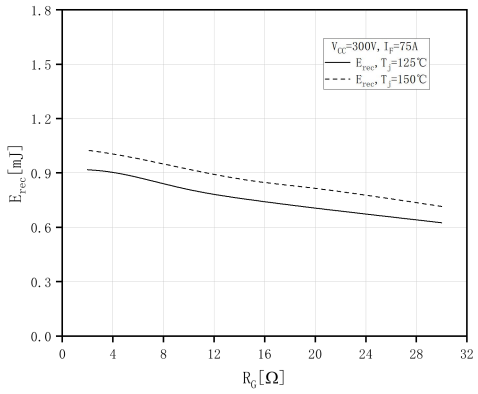
升压正向偏压特性 二极管,逆变器（典型）
Boost forward characteristic of Diode, Inverter(typical)



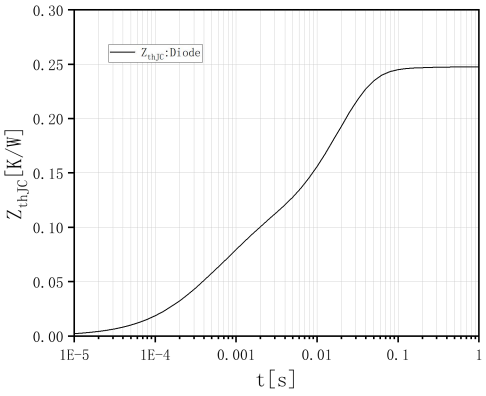
升压开关损耗 二极管, 逆变器（典型）
Boost switching losses Diode, Inverter(typical)



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



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



TLM75M07S1P

使用条件及条款

Terms & Conditions of usage

本文档所提供的任何信息绝不应当被视为针对任何条件或者品质而做出的保证（质量保证）。本公司对于本文档中所提及的任何事例、提示或者任何特定数值及/或任何关于产品应用方面的信息均在此明确声明本公司不承担任何保证或者责任，包括但不限于其不侵犯任何第三方知识产权的保证均在此排除。

此外，本文档所提供的任何信息均取决于客户履行本文档所载明的义务和客户遵守适用于客户产品以及与客户对于本公司产品的应用所相关的任何法律要求、规范和标准。

本文档所含的数据仅供经过专业技术培训的人员使用。客户自身的技术部门有义务对于产品是否适宜于其预期的应用和针对该种应用而言本文档中所提供的信息是否充分自行予以评估。如需产品、技术、交付条款和条件以及价格等进一步信息，请向本公司接洽。

The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics("quality guarantee"). With respect to any examples, hints or any typical values stated herein and/or any information regarding the application of the product, Cpower Technology hereby disclaims any and all warranties and liabilities of any kind, including without limitation warranties of non-infringement of intellectual property rights of any third party.

In addition, any information given in this document is subject to customer's compliance with its obligations stated in this document and any applicable legal requirements, norms and standards concerning customer's products and any use of the product of Cpower Technology in customer's applications.

The data contained in this document is exclusively intended for technically trained staff. It is the responsibility of customer's technical departments to evaluate the suitability of the product for the intended application and the completeness of the product information given in this document with respect to such application.

For further information on the product, technology, delivery terms and conditions and prices please contact Cpower Technology.