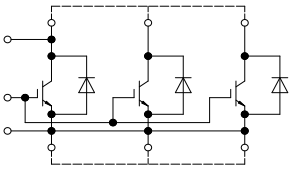
技术信息 / Technical Information

IGBT-模块
IGBT-Module

FZ3600R17HP4_B2

IHM-B 模块 采用第四代沟槽栅/场终止IGBT4和发射极控制二极管
IHM-B module with Trench/Fieldstop IGBT4 and Emitter Controlled diode





V_{CES} = 1700V
$I_{C\ nom}$ = 3600A / I_{CRM} = 7200A

典型应用
- 谐振逆变器应用
- 大功率变流器
- 牵引变流器
- 风力发电机

Typical Applications
- Resonant inverter applications
- High power converters
- Traction drives
- Wind turbines

电气特性
- 提高工作结温 $T_{vj\ op}$
- 低 V_{CEsat}
- 增大的二极管针对反馈运行模式

Electrical Features
- Extended operating temperature $T_{vj\ op}$
- Low V_{CEsat}
- Enlarged diode for regenerative operation

机械特性
- 4 kV 交流 1分钟 绝缘
- 碳化硅铝（AlSiC）基板提供更高的温度循环能力
- 封装的 CTI > 400
- 高爬电距离和电气间隙
- 高功率循环和温度循环能力
- 高功率密度
- IHM B 封装

Mechanical Features
- 4 kV AC 1min insulation
- AlSiC base plate for increased thermal cycling capability
- Package with CTI > 400
- High creepage and clearance distances
- High power and thermal cycling capability
- High power density
- IHM B housing

Module Label Code

Barcode Code 128



DMX - 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

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approved by: IB	revision: V3.1	UL approved (E83335)

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°C	V_{CES}		1700	V
连续集电极直流电流 Continuous DC collector current	T_C = 100°C, $T_{vj\,max}$ = 175°C	$I_{C\,nom}$		3600	A
集电极重复峰值电流 Repetitive peak collector current	t_P = 1 ms	I_{CRM}		7200	A
总功率损耗 Total power dissipation	T_C = 25°C, $T_{vj\,max}$ = 175°C	P_{tot}		19,5	kW
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 = 3600 A, V_{GE} = 15 V I_C = 3600 A, V_{GE} = 15 V I_C = 3600 A, V_{GE} = 15 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	$V_{CE\,sat}$	1,90 2,30 2,40	2,25	V V V
栅极阈值电压 Gate threshold voltage	I_C = 145 mA, V_{CE} = V_{GE}, T_{vj} = 25°C		V_{GEth}	5,20	5,80	6,40	V
栅极电荷 Gate charge	V_{GE} = -15 V ... +15 V		Q_G		38,0		µC
内部栅极电阻 Internal gate resistor	T_{vj} = 25°C		R_{Gint}		0,54		Ω
输入电容 Input capacitance	f = 1 MHz, T_{vj} = 25°C, V_{CE} = 25 V, V_{GE} = 0 V		C_{ies}		295		nF
反向传输电容 Reverse transfer capacitance	f = 1 MHz, T_{vj} = 25°C, V_{CE} = 25 V, V_{GE} = 0 V		C_{res}		9,50		nF
集电极-发射极截止电流 Collector-emitter cut-off current	V_{CE} = 1700 V, V_{GE} = 0 V, T_{vj} = 25°C		I_{CES}			5,0	mA
栅极-发射极漏电流 Gate-emitter leakage current	V_{CE} = 0 V, V_{GE} = 20 V, T_{vj} = 25°C		I_{GES}			400	nA
开通延迟时间(电感负载) Turn-on delay time, inductive load	I_C = 3600 A, V_{CE} = 900 V V_{GE} = ±15 V R_{Gon} = 0,6 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	$t_{d\,on}$		0,55 0,63 0,65		µs µs µs
上升时间(电感负载) Rise time, inductive load	I_C = 3600 A, V_{CE} = 900 V V_{GE} = ±15 V R_{Gon} = 0,6 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	t_r		0,28 0,29 0,295		µs µs µs
关断延迟时间(电感负载) Turn-off delay time, inductive load	I_C = 3600 A, V_{CE} = 900 V V_{GE} = ±15 V R_{Goff} = 0,5 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	$t_{d\,off}$		1,60 1,70 1,75		µs µs µs
下降时间(电感负载) Fall time, inductive load	I_C = 3600 A, V_{CE} = 900 V V_{GE} = ±15 V R_{Goff} = 0,5 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	t_f		0,21 0,315 0,345		µs µs µs
开通损耗能量 (每脉冲) Turn-on energy loss per pulse	I_C = 3600 A, V_{CE} = 900 V, L_S = 50 nH V_{GE} = ±15 V, di/dt = 12000 A/µs (T_{vj} = 150°C) R_{Gon} = 0,6 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	E_{on}		780 980 1050		mJ mJ mJ
关断损耗能量 (每脉冲) Turn-off energy loss per pulse	I_C = 3600 A, V_{CE} = 900 V, L_S = 50 nH V_{GE} = ±15 V, du/dt = 2350 V/µs (T_{vj} = 150°C) R_{Goff} = 0,5 Ω	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	E_{off}		1200 1450 1500		mJ mJ mJ
短路数据 SC data	V_{GE} ≤ 15 V, V_{CC} = 1000 V V_{CEmax} = V_{CES} -L_{sCE} ·di/dt	t_P ≤ 10 µs, T_{vj} = 150°C	I_{SC}		14000		A
结 - 外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		R_{thJC}			5,70	K/kW
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个 IGBT / per IGBT λ_{Paste} = 1 W/(m·K) / λ_{grease} = 1 W/(m·K)		R_{thCH}		9,70		K/kW
在开关状态下温度 Temperature under switching conditions			$T_{vj\,op}$	-40		150	°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°C	V_{RRM}	1700	V
连续正向直流电流 Continuous DC forward current		I_F	3600	A
正向重复峰值电流 Repetitive peak forward current	t_P = 1 ms	I_{FRM}	7200	A
I2t-值 I²t - value	V_R = 0 V, t_P = 10 ms, T_{vj} = 125°C V_R = 0 V, t_P = 10 ms, T_{vj} = 150°C	I²t	2100 2000	kA²s kA²s
最大损耗功率 Maximum power dissipation	T_{vj} = 125°C	P_{RQM}	4900	kW
最小开通时间 Minimum turn-on time		$t_{on\ min}$	10,0	µs

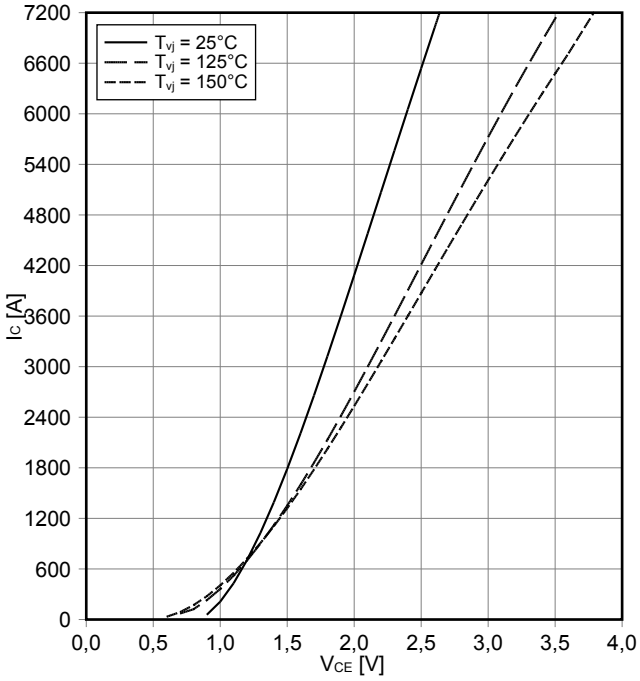
特征值 / Characteristic Values

			min.	typ.	max.	
正向电压 Forward voltage	I_F = 3600 A, V_{GE} = 0 V I_F = 3600 A, V_{GE} = 0 V I_F = 3600 A, V_{GE} = 0 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	V_F		1,65 1,65 1,65	2,10	V V V
反向恢复峰值电流 Peak reverse recovery current	I_F = 3600 A, - di_F/dt = 12000 A/µs (T_{vj}=150°C) V_R = 900 V V_{GE} = -15 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	I_{RM}		2900 3400 3650		A A A
恢复电荷 Recovered charge	I_F = 3600 A, - di_F/dt = 12000 A/µs (T_{vj}=150°C) V_R = 900 V V_{GE} = -15 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	Q_r		850 1550 1750		µC µC µC
反向恢复损耗（每脉冲） Reverse recovery energy	I_F = 3600 A, - di_F/dt = 12000 A/µs (T_{vj}=150°C) V_R = 900 V V_{GE} = -15 V	T_{vj} = 25°C T_{vj} = 125°C T_{vj} = 150°C	E_{rec}		550 1050 1250		mJ mJ mJ
结 - 外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		R_{thJC}			8,06	K/kW
外壳 - 散热器热阻 Thermal resistance, case to heatsink	每个二极管 / per diode λ_{Paste} = 1 W/(m·K) / λ_{grease} = 1 W/(m·K)		R_{thCH}		10,5		K/kW
在开关状态下温度 Temperature under switching conditions			$T_{vj\ op}$	-40		150	°C

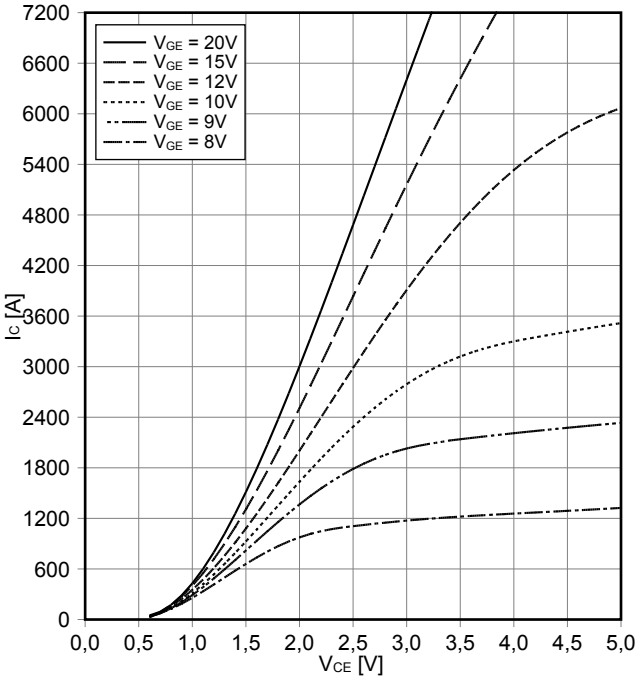
模块 / Module

绝缘测试电压 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				AlSiC		
爬电距离 Creepage distance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal			32,2 32,2		mm
电气间隙 Clearance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal			19,1 19,1		mm
相对电痕指数 Comperative tracking index		CTI		> 400		
			min.	typ.	max.	
杂散电感,模块 Stray inductance module		L_{sCE}		6,0		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	$R_{CC'+EE'}$		0,085		mΩ
储存温度 Storage temperature		T_{stg}	-40		150	°C
模块安装的安装扭距 Mounting torque for modul mounting	螺丝 M6 根据相应的应用手册进行安装 Screw M6 - Mounting according to valid application note	M	4,25		5,75	Nm
端子联接扭距 Terminal connection torque	螺丝 M4 根据相应的应用手册进行安装 Screw M4 - Mounting according to valid application note 螺丝 M8 根据相应的应用手册进行安装 Screw M8 - Mounting according to valid application note	M	1,8 8,0	- -	2,1 10	Nm Nm
重量 Weight		G		1200		g

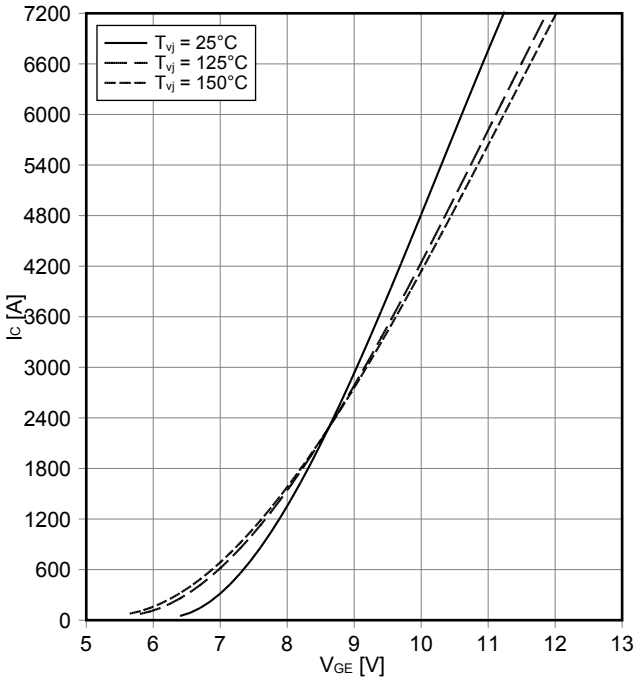
输出特性 IGBT, 逆变器 （典型)
output characteristic IGBT,Inverter (typical)
$I_C = f(V_{CE})$
V_{GE} = 15 V



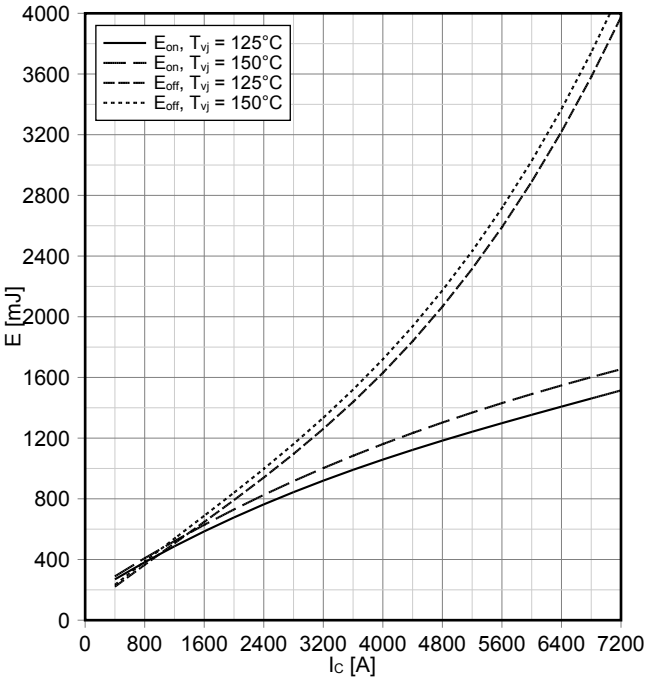
输出特性 IGBT, 逆变器 （典型)
output characteristic IGBT,Inverter (typical)
$I_C = f(V_{CE})$
T_{vj} = 150°C



传输特性 IGBT, 逆变器 (典型)
transfer characteristic IGBT,Inverter (typical)
$I_C = f(V_{GE})$
V_{CE} = 20 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} = ±15 V, R_{Gon} = 0.6 Ω, R_{Goff} = 0.5 Ω, V_{CE} = 900 V



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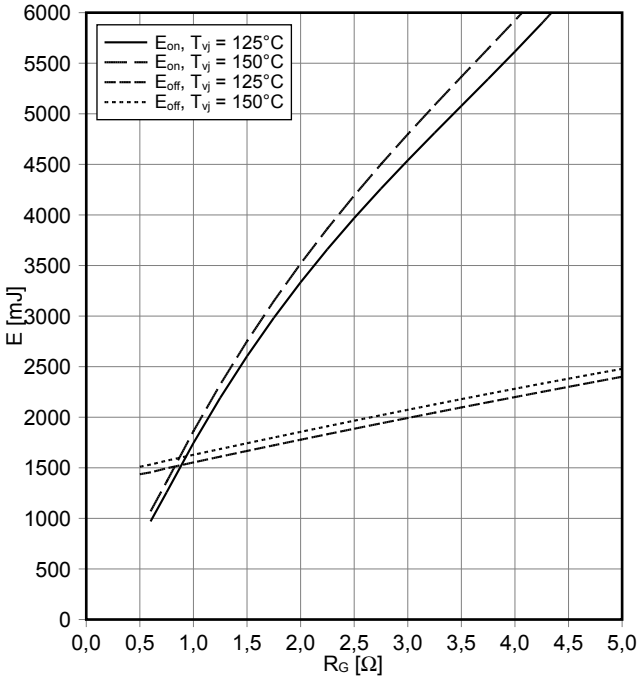
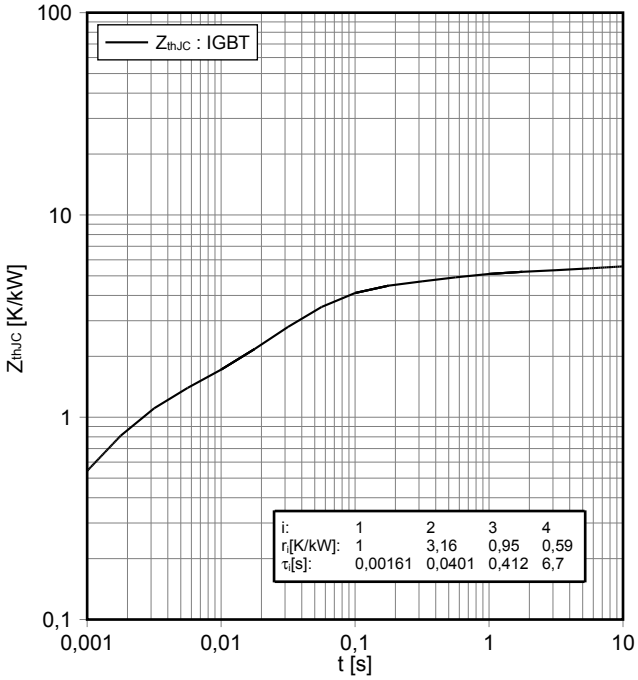
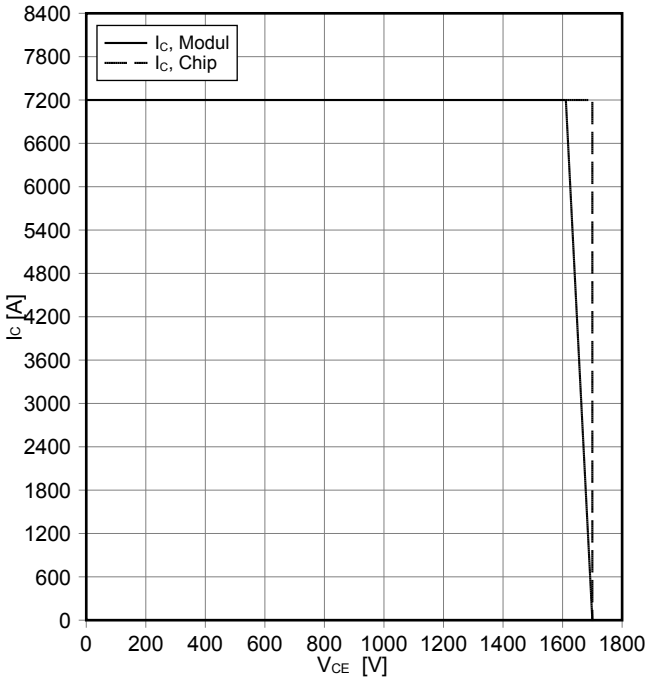
开关损耗 IGBT, 逆变器 （典型）
switching losses IGBT,Inverter (typical)
$E_{on} = f(R_G)$, $E_{off} = f(R_G)$
V_{GE} = ±15 V, I_C = 3600 A, V_{CE} = 900 V



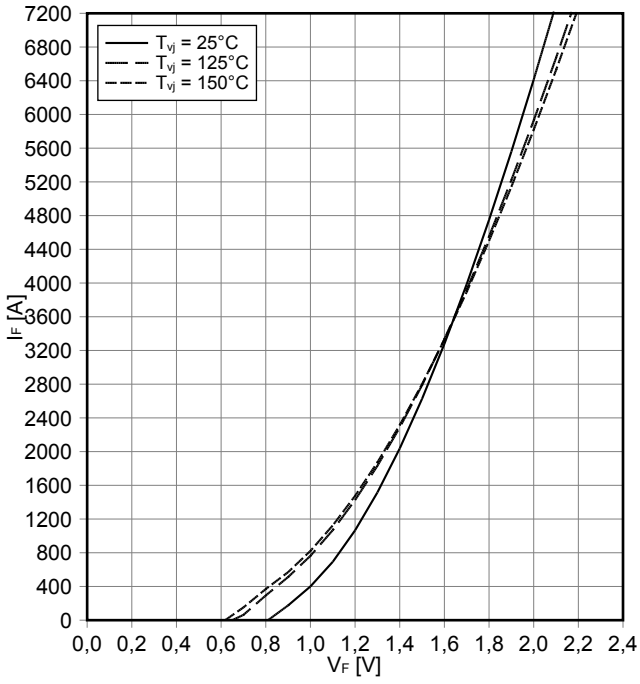
瞬态热阻抗 IGBT, 逆变器
transient thermal impedance IGBT,Inverter
$Z_{thJC} = f(t)$



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} = ±15 V, R_{Goff} = 0.5 Ω, T_{vj} = 150°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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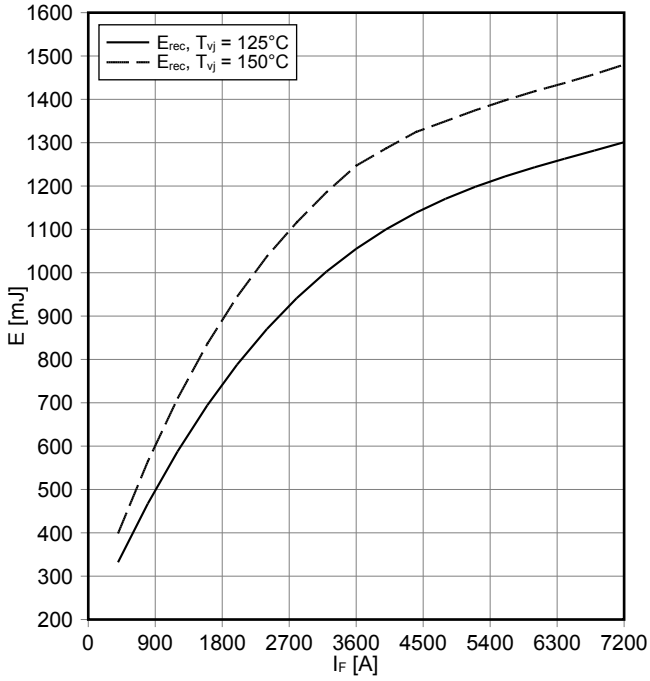
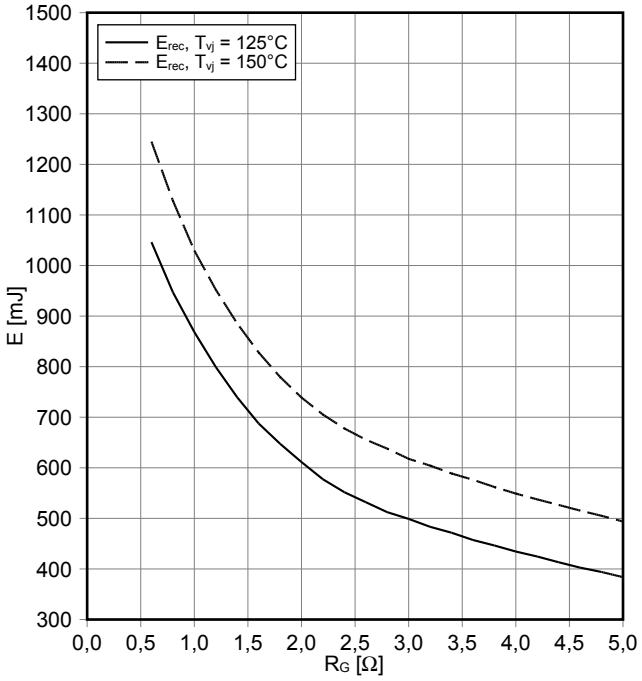
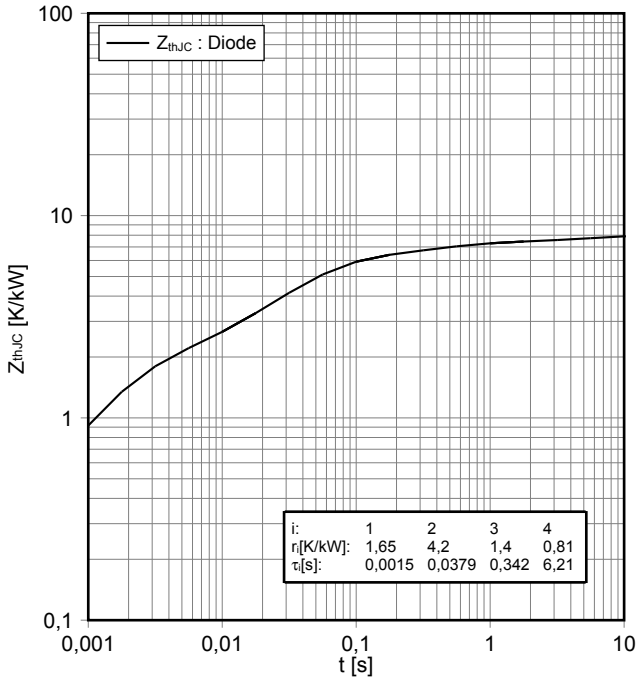
开关损耗 二极管,逆变器 （典型)
switching losses Diode, Inverter (typical)
$E_{rec} = f(I_F)$
$R_{Gon} = 0.6\ \Omega$, $V_{CE} = 900$ V



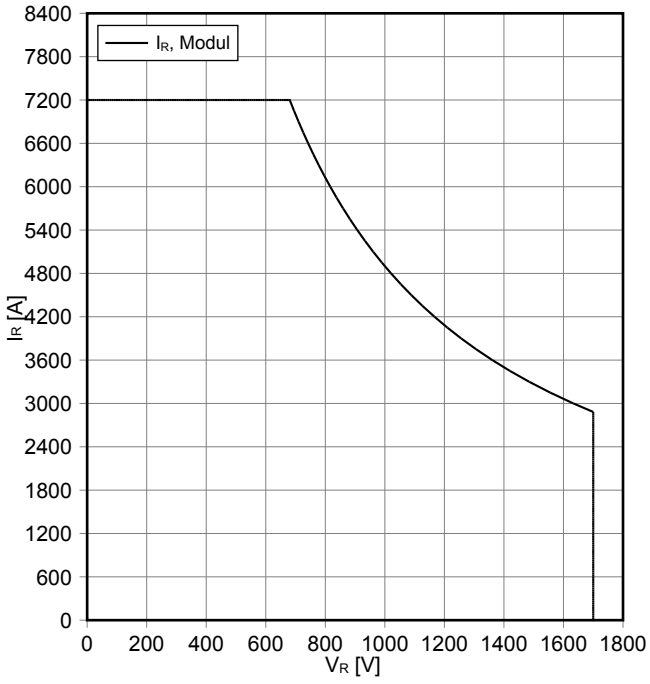
开关损耗 二极管,逆变器 （典型)
switching losses Diode, Inverter (typical)
$E_{rec} = f(R_G)$
$I_F = 3600$ A, $V_{CE} = 900$ V



瞬态热阻抗 二极管,逆变器
transient thermal impedance Diode, Inverter
$Z_{thJC} = f(t)$



安全工作区 二极管,逆变器 (SOA)
safe operation area Diode, Inverter (SOA)
$I_R = f(V_R)$
$T_{vj} = 150°C$



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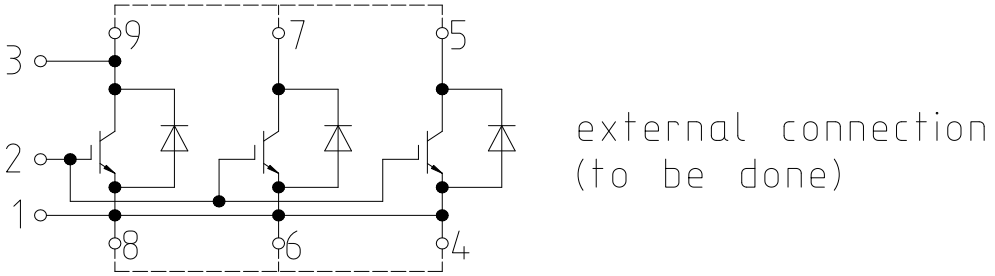
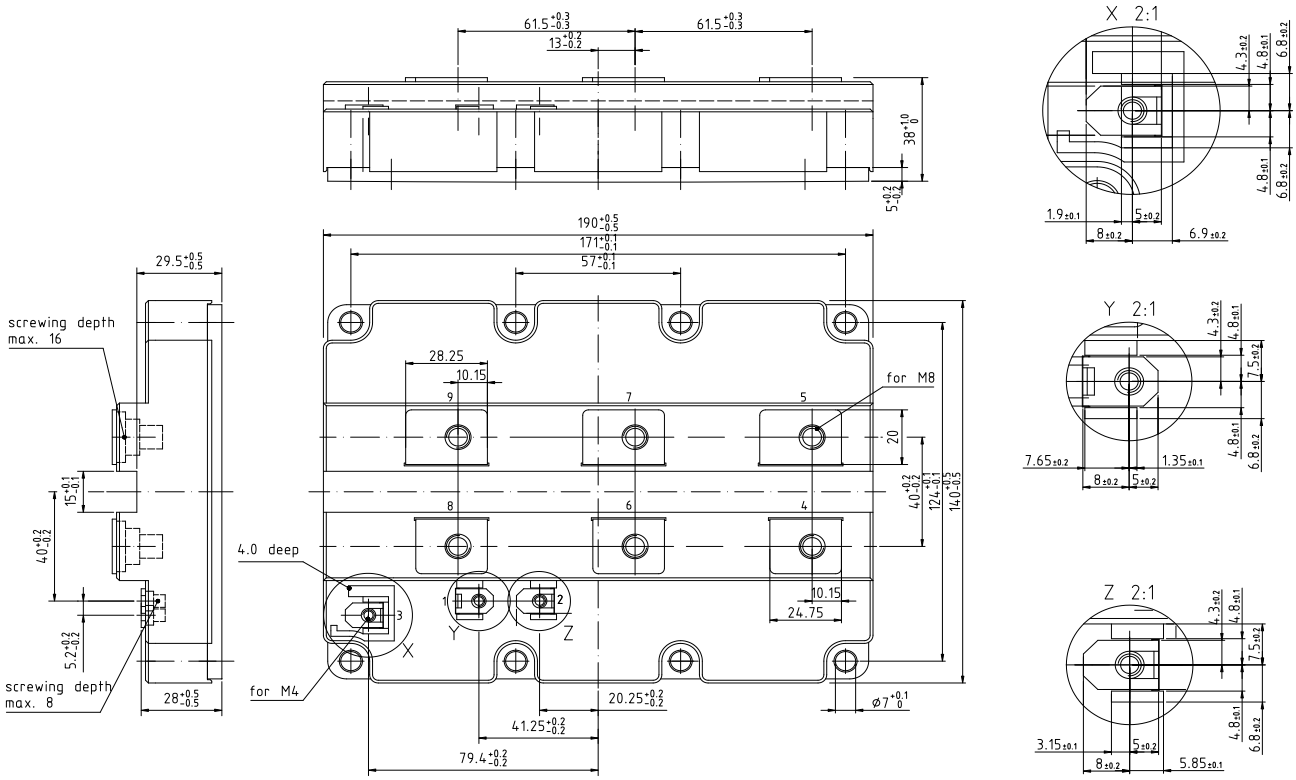
接线图 / Circuit diagram



封装尺寸 / Package outlines



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Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

www.entegreci.com

Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

www.entegreci.com | **destek@entegreci.com** | **0850 305 90 34**

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