

#### ➤ 产品外观 / Appearance



$V_{CES} = 1200V$

$I_{C\ nom} = 150A / I_{CRM} = 300A$

#### ➤ 特性 / Features

A. 低饱和压降

A. Low  $V_{CEsat}$

B. 低开关损耗

B. Low Switching Losses

C. 低电感模块结构

C. Low Inductance Module Structure

#### ➤ 用途 / Applications

A. 电机传动

A. Motor Drives

B. 不间断电源应用

B. UPS Systems

C. 高频开关应用

C. High Frequency Switching Application

#### ➤ 相关信息 / Related Information

条形码 / Barcode Code

二维码 / DMX – Code



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# CLA150ZL120S1P

## IGBT, 制动-斩波器 / IGBT, Chopper



### 最大额定值 / Maximum Rated Values

集电极-发射极电压 Collector-emitter voltage	$T_j = 25^\circ\text{C}$	$V_{CES}$	1200	V
连续集电极直流电流 Continuous DC collector current	$T_C = 100^\circ\text{C}, T_{j\max} = 150^\circ\text{C}$	$I_{C\text{ nom}}$	150	A
集电极重复峰值电流 Repetitive peak collector current	$t_p = 1\text{ ms}$	$I_{CRM}$	300	A
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	$I_C = 150\text{ A}, V_{GE} = 15\text{ V}$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	$V_{CE\text{ sat}}$	1.95 2.15	2.25	V
栅极阈值电压 Gate threshold voltage	$I_C = 4\text{ mA}, V_{CE} = V_{GE}, T_j = 25^\circ\text{C}$		$V_{GE\text{ th}}$	5.0	5.8	6.5
内部栅极电阻 Internal gate resistor	$T_j = 25^\circ\text{C}$		$R_{G\text{ int}}$	1.25		$\Omega$
输入电容/Input capacitance	$f = 1\text{ MHz}, T_j = 25^\circ\text{C}, V_{CE} = 25\text{ V}, V_{GE} = 0\text{ V}$		$C_{ies}$	12.5		nF
反向传输电容 Reverse transfer capacitance			$C_{res}$	0.6		nF
集电极-发射极截止电流 Collector-emitter cut-off current	$V_{CE} = 1200\text{ V}, V_{GE} = 0\text{ V}, T_j = 25^\circ\text{C}$		$I_{CES}$		1.0	mA
栅极-发射极漏电流 Gate-emitter leakage current	$V_{CE} = 0\text{ V}, V_{GE} = 20\text{ V}, T_j = 25^\circ\text{C}$		$I_{GES}$		400	nA
开通延迟时间 Turn-on delay time	$I_C = 150\text{ A}, V_{CE} = 600\text{ V}$ $V_{GE} = \pm 15\text{ V}$ $R_G = 4.7\ \Omega$ Inductive Load	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	$t_{d\text{ on}}$	68 90		ns
上升时间/Rise time		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	$t_r$	63 75		ns
关断延迟时间 Turn-off delay time		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	$t_{d\text{ off}}$	519 580		ns
下降时间/Fall time		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	$t_f$	34 40		ns
开通损耗能量 Turn-on energy loss		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	$E_{on}$	15.1 21.6		mJ
关断损耗能量 Turn-off energy loss		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	$E_{off}$	7.0 10.5		mJ
短路数据/SC data		$V_{GE} \leq 15\text{ V}, V_{CC} = 600\text{ V}$ $t_p \leq 10\ \mu\text{s}, T_j = 125^\circ\text{C}$		$I_{sc}$	1100	
结 - 外壳热阻 Thermal resistance, junction to case	每个 IGBT / per IGBT		$R_{thJC}$		0.11	K/W
在开关状态下温度 Temperature under switching			$T_{j\text{ op}}$	-40	125	$^\circ\text{C}$

# CLA150ZL120S1P

## 二极管, 制动-斩波器 / Diode, Chopper



### 最大额定值 / Maximum Rated Values

反向重复峰值电压 Repetitive peak reverse voltage	$T_j = 25^\circ\text{C}$	$V_{RRM}$	1200	V
连续正向直流电流 Continuous DC forward current		$I_F$	150	A
正向重复峰值电流 Repetitive peak forward current	$t_p = 1\text{ ms}$	$I_{FRM}$	300	A

### 特征值 / Characteristic Values

			Min.	Typ.	Max.	
正向电压/Forward voltage	$I_F = 150\text{ A}, V_{GE} = 0\text{ V}$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	$V_F$	1.70 1.75		V
反向恢复峰值电流 Peak reverse recovery current		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	$I_{RM}$	115 140		A
恢复电荷/Recovered charge	$I_F = 150\text{ A}, V_R = 600\text{ V}$ $V_{GE} = -15\text{ V}$ $-di_F/dt = 2250\text{ A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	$Q_r$	11.4 16.8		$\mu\text{C}$
反向恢复损耗 Reverse recovery energy		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	$E_{rec}$	7.6 12.1		mJ
结 - 外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		$R_{thJC}$		0.18	K/W
在开关状态下温度 Temperature under switching			$T_{j\text{ op}}$	-40	125	$^\circ\text{C}$

# CLA150ZL120S1P

## 反向二极管 / Diode, Reverse



### 最大额定值 / Maximum Rated Values

反向重复峰值电压 Repetitive peak reverse voltage	$T_j = 25^\circ\text{C}$	$V_{RRM}$	1200	V
连续正向直流电流 Continuous DC forward current		$I_F$	150	A
正向重复峰值电流 Repetitive peak forward current	$t_p = 1\text{ ms}$	$I_{FRM}$	300	A

### 特征值 / Characteristic Values

			Min.	Typ.	Max.	
正向电压/Forward voltage	$I_F = 150\text{ A}, V_{GE} = 0\text{ V}$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	$V_F$	1.70 1.75		V
反向恢复峰值电流 Peak reverse recovery current		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	$I_{RM}$	115 140		A
恢复电荷/Recovered charge	$I_F = 150\text{ A}, V_R = 600\text{ V}$ $V_{GE} = -15\text{ V}$ $-di_F/dt = 2250\text{ A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	$Q_r$	11.4 16.8		$\mu\text{C}$
反向恢复损耗 Reverse recovery energy		$T_j = 25^\circ\text{C}$ $T_j = 125^\circ\text{C}$	$E_{rec}$	7.6 12.1		mJ
结 - 外壳热阻 Thermal resistance, junction to case	每个二极管 / per diode		$R_{thJC}$		0.18	K/W
在开关状态下温度 Temperature under switching			$T_{j\text{ op}}$	-40	125	$^\circ\text{C}$

# CLA150ZL120S1P

## 模块 / Module



绝缘测试电压 Isolation test voltage	RMS, f = 50 Hz, t = 1 min.	V <sub>ISOL</sub>	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 (class1, IEC 61140)		Al <sub>2</sub> O <sub>3</sub>	
爬电距离/Creepage distance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal		17.0 20.0	mm
电气间隙/Clearance	端子至散热器 / terminal to heatsink 端子至端子 / terminal to terminal		17.0 9.5	mm
相对电痕指数 Comperative tracking index		CTI	> 200	

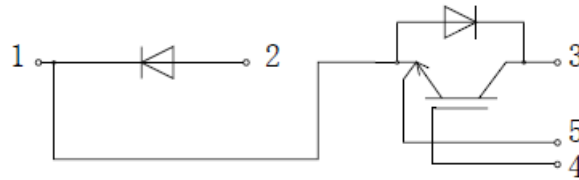
			Min.	Typ.	Max.	
杂散电感, 模块 Stray inductance module		L <sub>SCE</sub>		30		nH
模块引线电阻 Module lead resistance	T <sub>c</sub> = 25 °C, 每个开关 / per switch	R <sub>CC'+EE'</sub>		0.65		mΩ
储存温度/Storage temperature		T <sub>stg</sub>	-40		125	°C
模块安装的安装扭矩 / Mounting torque for module mounting	螺丝 M6 / Screw M6	M	3.00		5.00	Nm
端子联接扭矩 Terminal connection torque	螺丝 M5 / Screw M5	M	2.5		5.0	Nm
重量/Weight		G		150		g

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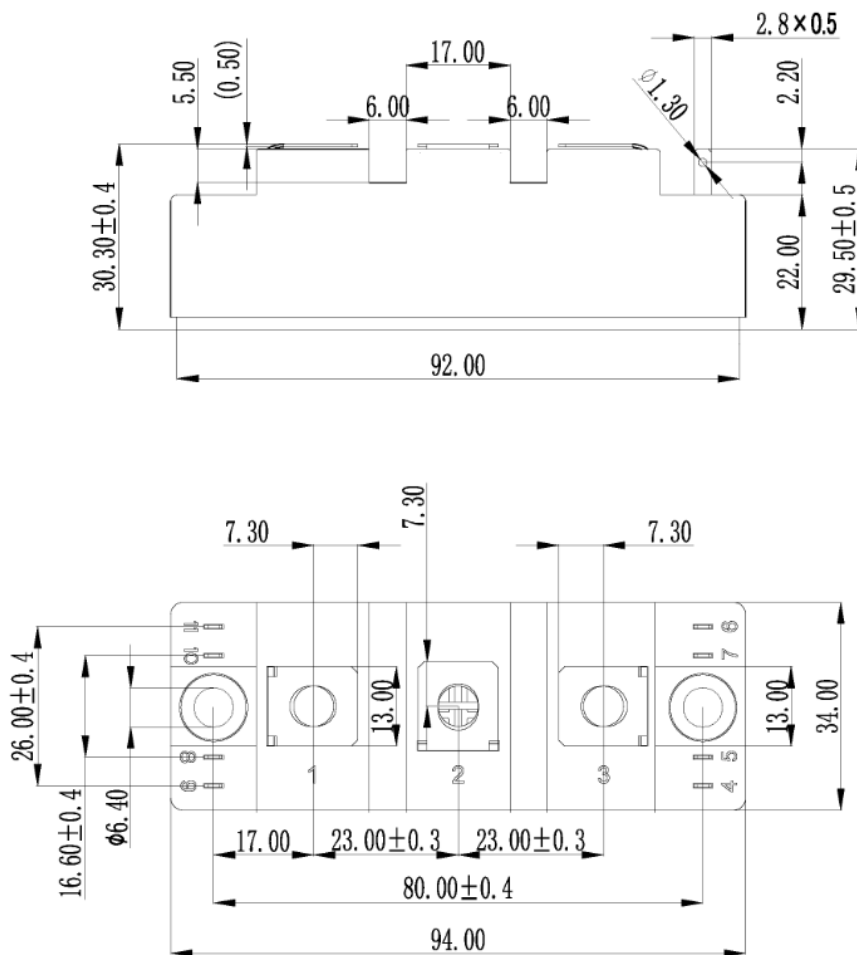


## 封装 / Package

### 接线图 / Circuit Diagram



### 封装尺寸 / Package outlines

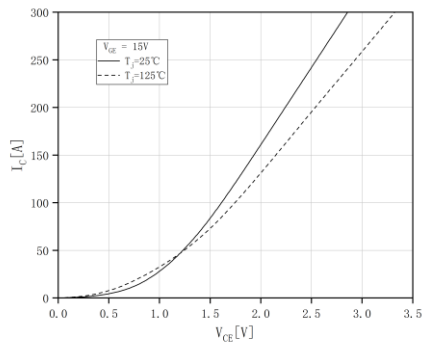


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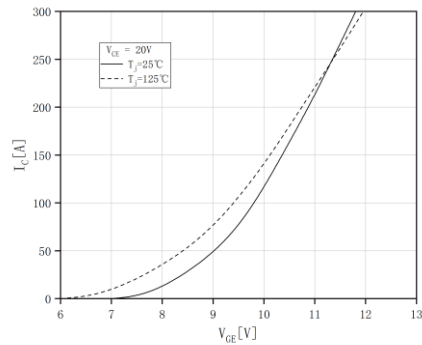


## 性能 / Performance

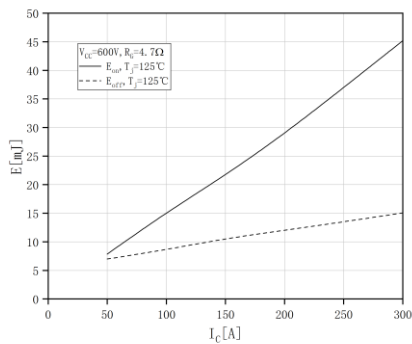
输出特性 IGBT, 制动-斩波器 (典型)  
output characteristic IGBT, Chopper (typical)



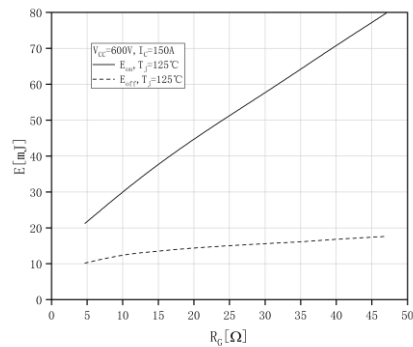
传输特性 IGBT, 制动-斩波器 (典型)  
output characteristic IGBT, Chopper (typical)



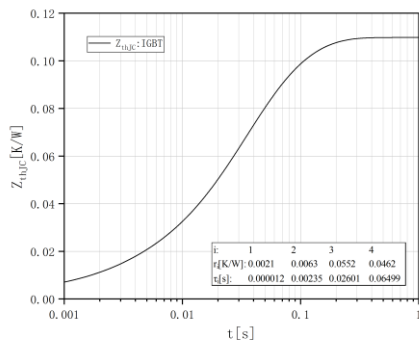
开关损耗 IGBT, 制动-斩波器 (典型)  
switching losses IGBT, Chopper (typical)



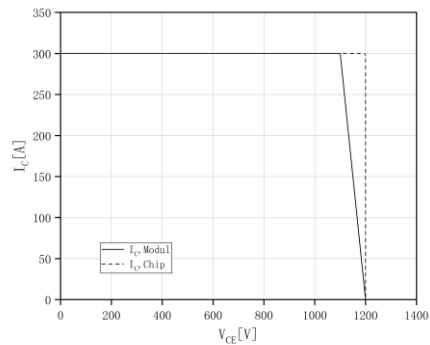
开关损耗 IGBT, 制动-斩波器 (典型)  
switching losses IGBT, Chopper (typical)



瞬态热阻抗 IGBT, 制动-斩波器  
transient thermal impedance IGBT, Chopper



反偏安全工作区 IGBT, 制动-斩波器 (RBSOA)  
Reverse bias safe operating area IGBT, Chopper(RBSOA)

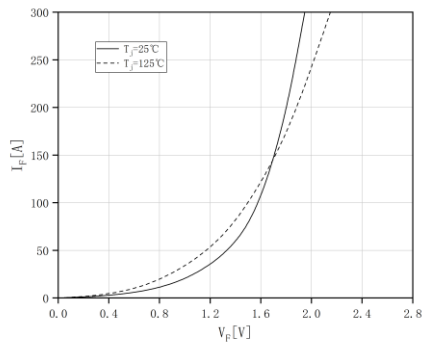


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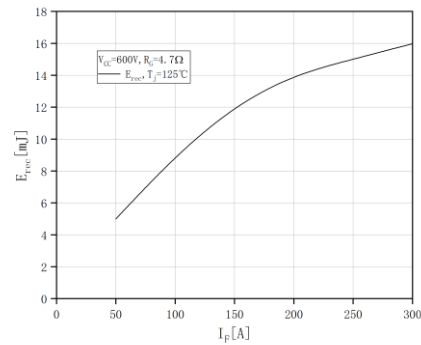


## 性能 / Performance

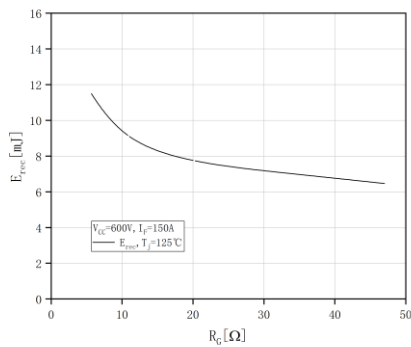
正向偏压特性 二极管, 制动-斩波器 (典型)  
forward characteristic of Diode, Chopper(typical)



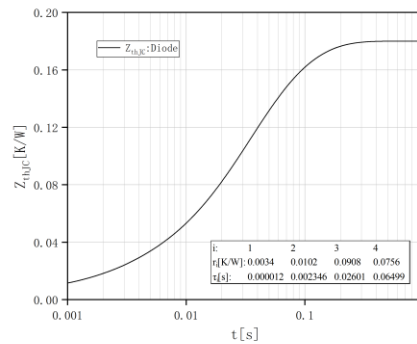
开关损耗 二极管, 制动-斩波器 (典型)  
switching losses Diode, Chopper(typical)



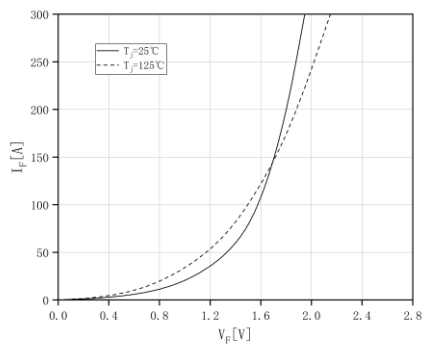
开关损耗 二极管, 制动-斩波器 (典型)  
switching losses Diode, Chopper(typical)



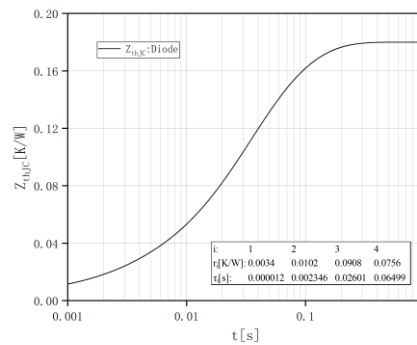
瞬态热阻抗 二极管, 制动-斩波器  
transient thermal impedance Diode, Chopper



正向偏压特性 反向二极管 (典型)  
forward characteristic of Diode, Reverse(typical)



瞬态热阻抗 反向二极管  
transient thermal impedance Diode, Reverse





# CLA150ZL120S1P

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