

1、主要参数 Main Characteristics

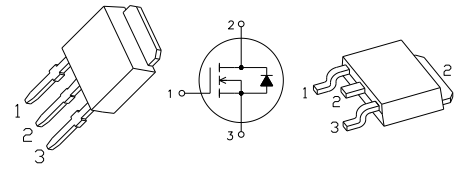
2、用途 Applications

- 负荷开关 Load Switch
- PWM 应用 PWM Application
- 电源管理 Power management

V_{DSS}	30	V
I_D	150	A
P_D	108	W
$R_{DS(ON)TYP}$	16	m Ω

3、产品特性 Features

- 沟槽工艺 MOSFET Trench FET Power MOSFET
- 低栅极电荷 Low gate charge
- 低 C_{rss} (典型值 431pF) Low C_{rss} (typical 431pF)
- 通态电阻低 Low ON Resistance
- 产品全部经过雪崩测试 100% avalanche tested
- RoHS 产品 RoHS product



TO-251S

TO-252S

1 栅极(G) 2 漏极 (D) 3 源极(S)

4. 电特性 Electrical Characteristics

4.1 极限值 Absolute Ratings ($T_c = 25^\circ\text{C}$)

参数名称 Parameter	符号 Symbol	额定值 Value	单位 Unit
漏极-源极电压 Drain-Source Voltage	V_{DSS}	30	V
连续漏极电流 Drain Current -continuous	I_D	$T_c = 25^\circ\text{C}$ 150 $T_c = 100^\circ\text{C}$ 98	A
最大脉冲漏极电流 (注 1) Drain Current - pulse (note 1)	I_{DM}	600	A
栅源电压 Gate-Source Voltage	V_{GS}	± 20	V
单脉冲雪崩能量 (注 2) Single Pulsed Avalanche Energy (note 2)	E_{AS}	225	mJ
耗散功率 Power Dissipation	P_D	108	W
结温, 贮存温度 Operating and Storage Temperature Range	T_j, T_{stg}	150, -55~175	$^\circ\text{C}$



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CM003N03C

Trench MOSFET

4.2 电参数 Electrical Characteristics (T_c = 25°C)

参数名称 Parameter	符号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单位 Units
截止特性 Off-Characteristics						
漏源击穿电压 Drain-Source Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	30			V
漏源击穿电压温度系数 Breakdown Voltage Temperature Coefficient	Δ BV _{DSS} / ΔT _J	I _D = 250 μA		0.08		V/°C
漏源漏电流 Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0, 25°C V _{DS} =24V, V _{GS} =0, 125°C			1 10	μA
栅源漏电流 Gate-body leakage current	I _{GSS}	V _{GS} = ±20V			±100	nA
导通特性 On-Characteristics						
静态导通电阻 (注3) Static Drain-Source On-Resistance (note 3)	R _{DS(on)*}	V _{GS} =10V, I _D =30A V _{GS} =4.5V, I _D =20A		16 18	20 22	mΩ
阈值电压 Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1	1.6	2.5	V
跨导 Forward Transconductance	g _{fs}	V _{DS} =15V, I _D =10A		11		S
脉冲宽度 tp≤380μs, 占空比 δ≤2%						
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V f=1.0MH		3500		pF
输出电容 Output capacitance	C _{oss}			500		
反向传输电容 Reverse transfer capacitance	C _{rss}			431		
开关特性 Switching Characteristics						
开启延迟(时间) Turn-On delay time	t _{d(ON)}	I _D = 30A V _{DD} = 15V V _{GS} = 10V R _{GEN} = 3Ω		26		nS
上升时间 Turn-On rise time	t _r			24		
关断延迟(时间) Turn-Off delay time	t _{d(OFF)}			91		
下降时间 Turn-Off Fall time	t _f			39		
栅极电荷 Total Gate Charge	Q _g	I _D =30A, V _{DS} =15V V _{GS} = 10V		38		nC
栅源电荷 Gate-Source charge	Q _{gs}			9		
栅漏电荷 Gate-Drain charge	Q _{gd}			13		

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源-漏二极管特性 Drain-Source Diode Characteristics						
源漏二极管连续电流 Maximum Continuous Drain-Source Diode Forward Current	I_{SD}	$T_c = 25\text{ }^\circ\text{C}$			150	A
源漏二极管脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current	I_{SDM}				600	A
源漏二极管正向压降 Drain-Source Diode Forward Voltage	V_{FSD}	$I_{SD}=30\text{A}, V_{GS}=0$			1.5	V
反向恢复时间 Reverse recovery time	t_{rr}	$I_{SD}=20\text{A}, T_j = 25\text{ }^\circ\text{C}$ $dI_F/dt=100\text{A}/\mu\text{s}, V_{GS}=0\text{V}$		42		nS
反向恢复电荷 Reverse recovery charge	Q_{rr}			39		nC

参数名称 Parameter	符号 Symbol	额定值 Value	单位 Unit
热阻（结到壳） Thermal Resistance, Junction to Case	$R_{\theta JC}$	1.56	$^\circ\text{C}/\text{W}$
热阻（结到环境） Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C}/\text{W}$

注:

- 1 重复脉冲, 宽度由最高结温限制
- 2 $L=0.5\text{mH}, I_D=30\text{A}$, 起始结温 $T_j=25\text{ }^\circ\text{C}$
- 3 脉冲测试: 脉冲宽度 $\leq 300\text{ }\mu\text{s}$, 占空比 $\leq 0.5\%$

Notes:

- 1 Pulse width limited by maximum junction temperature
- 2 $L=0.5\text{mH}, I_D=30\text{A}$, Starting $T_j=25\text{ }^\circ\text{C}$
- 3 Pulse Test: Pulse Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 0.5\%$

5. 特性曲线 Characteristics Curve

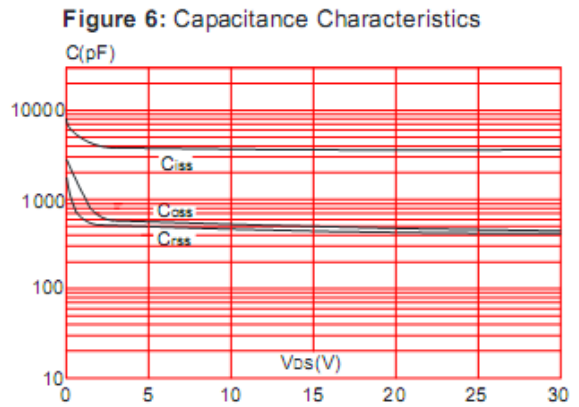
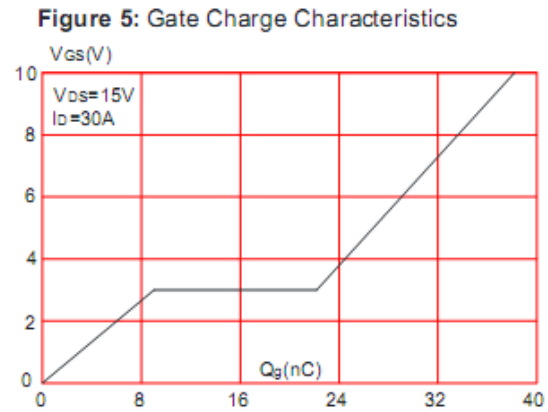
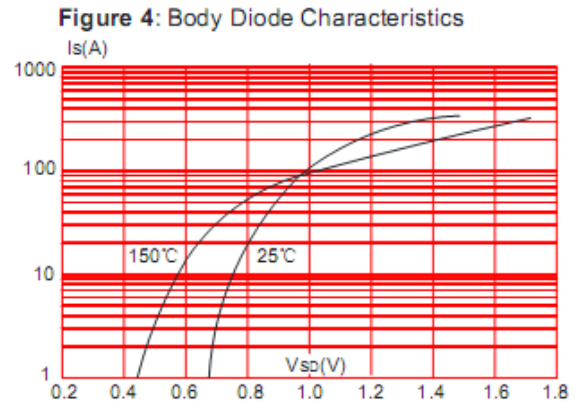
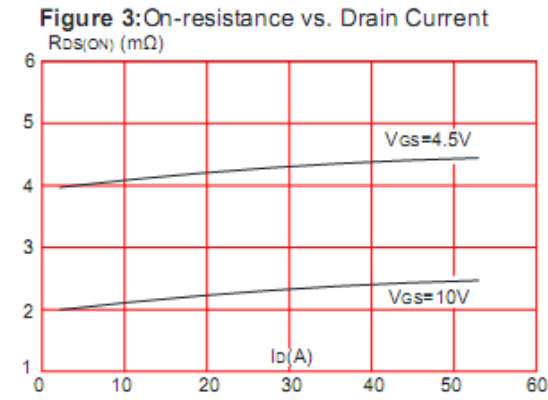
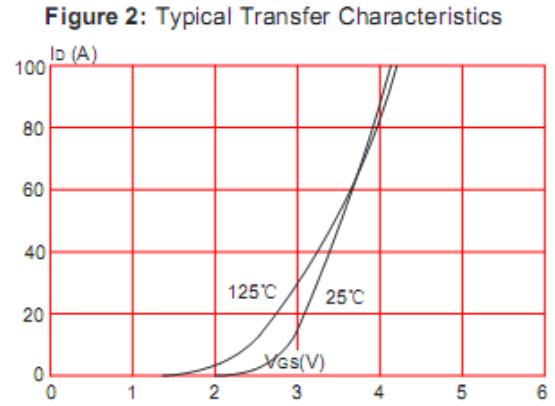
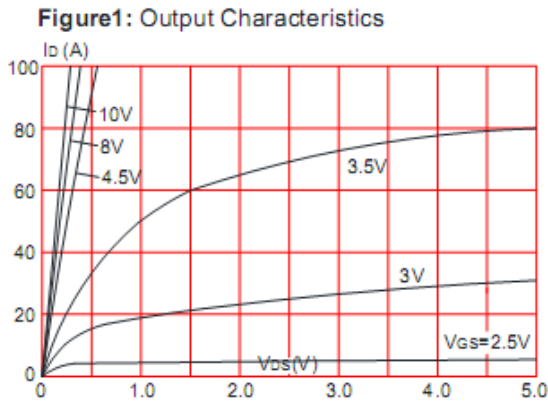


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

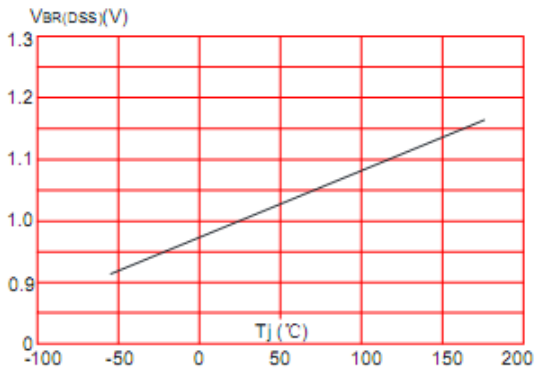


Figure 8: Normalized on Resistance vs. Junction Temperature

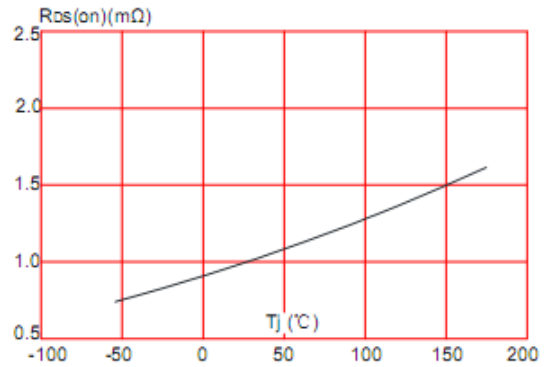


Figure 9: Maximum Safe Operating Area

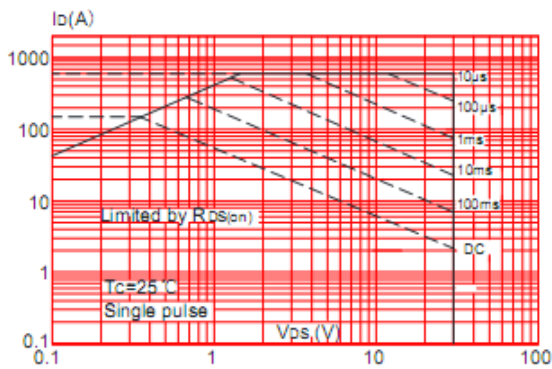


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

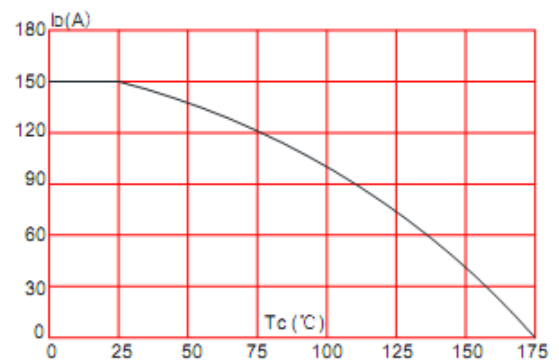
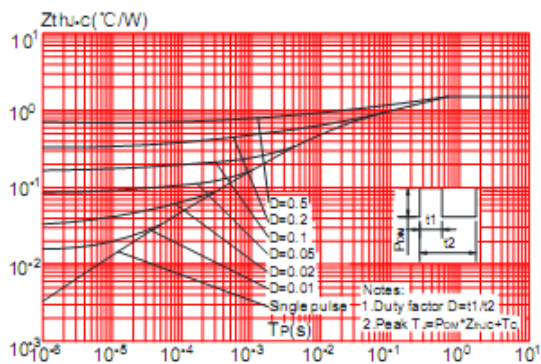


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



6. 测试电路 Test Circuit

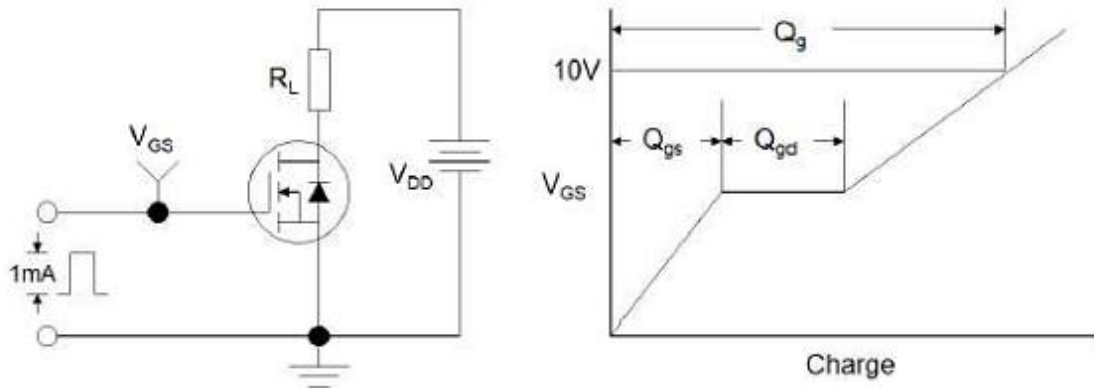


Figure1:Gate Charge Test Circuit & Waveform

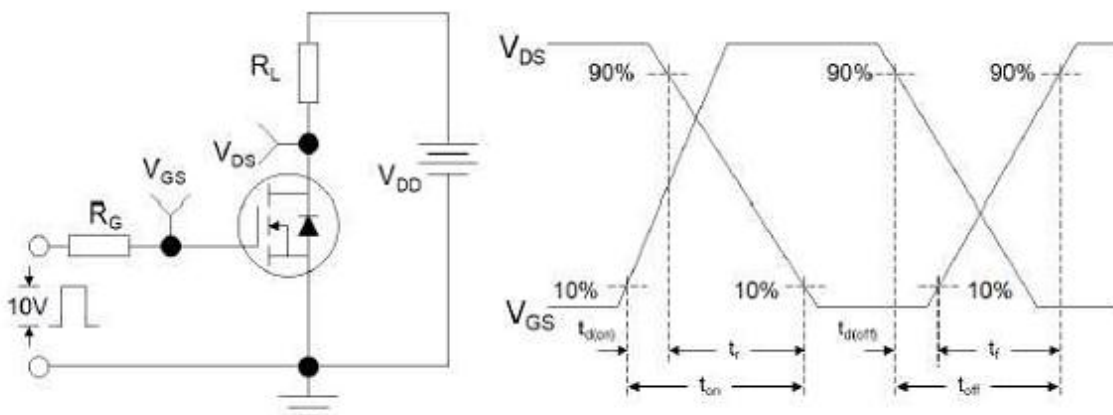


Figure 2: Resistive Switching Test Circuit & Waveforms

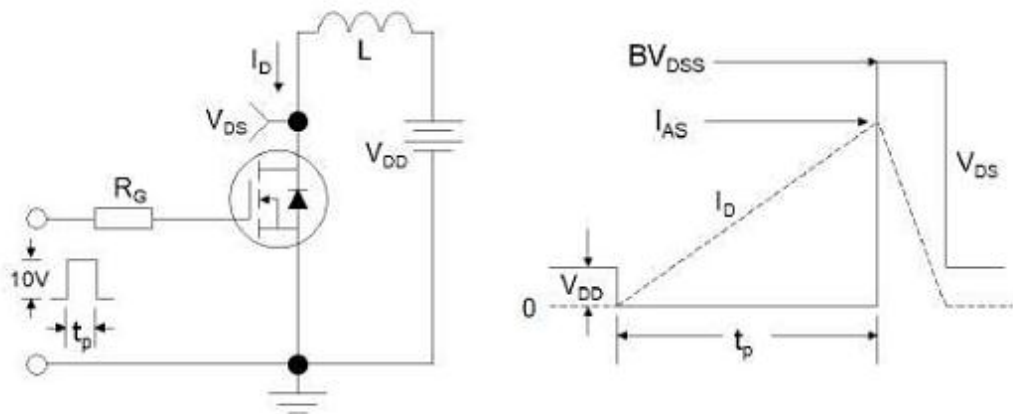
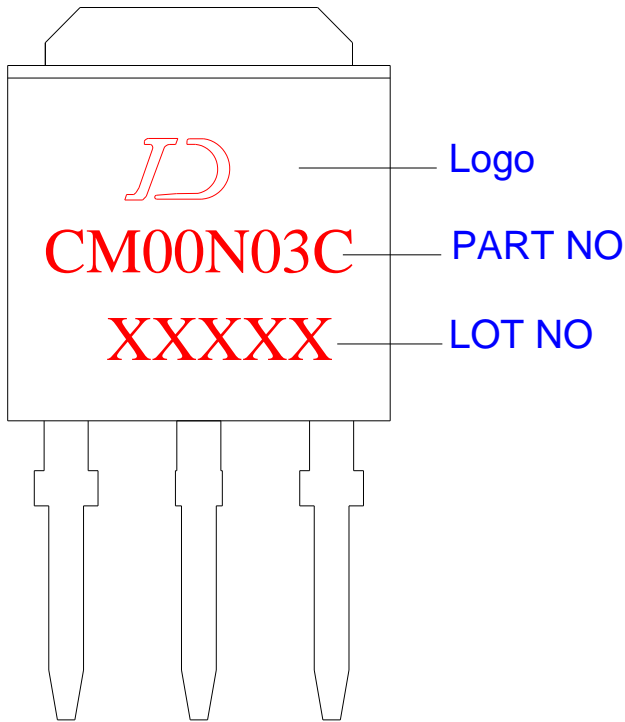


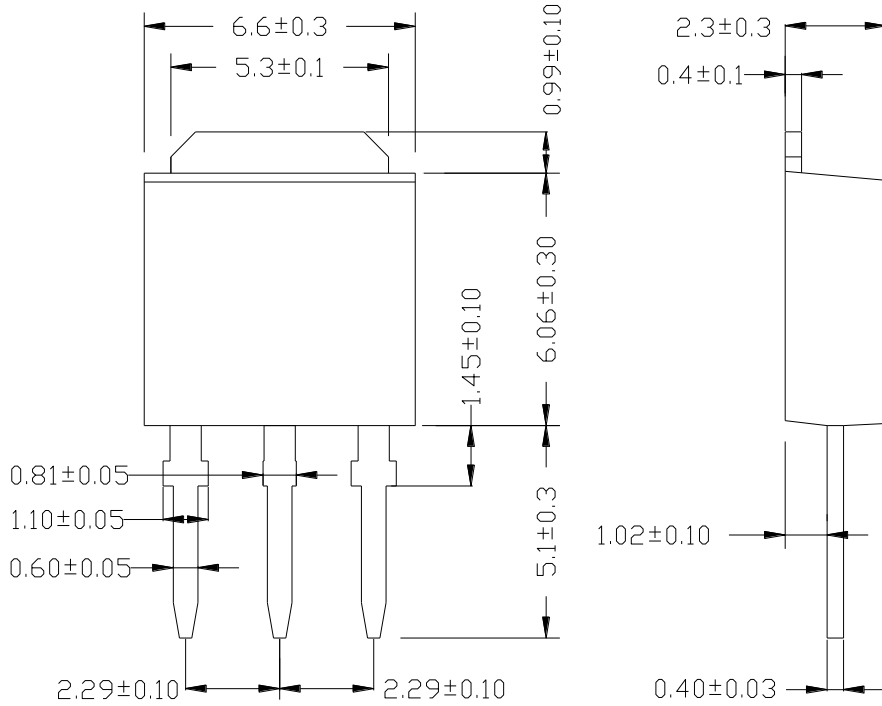
Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

7. Marking (印章说明)

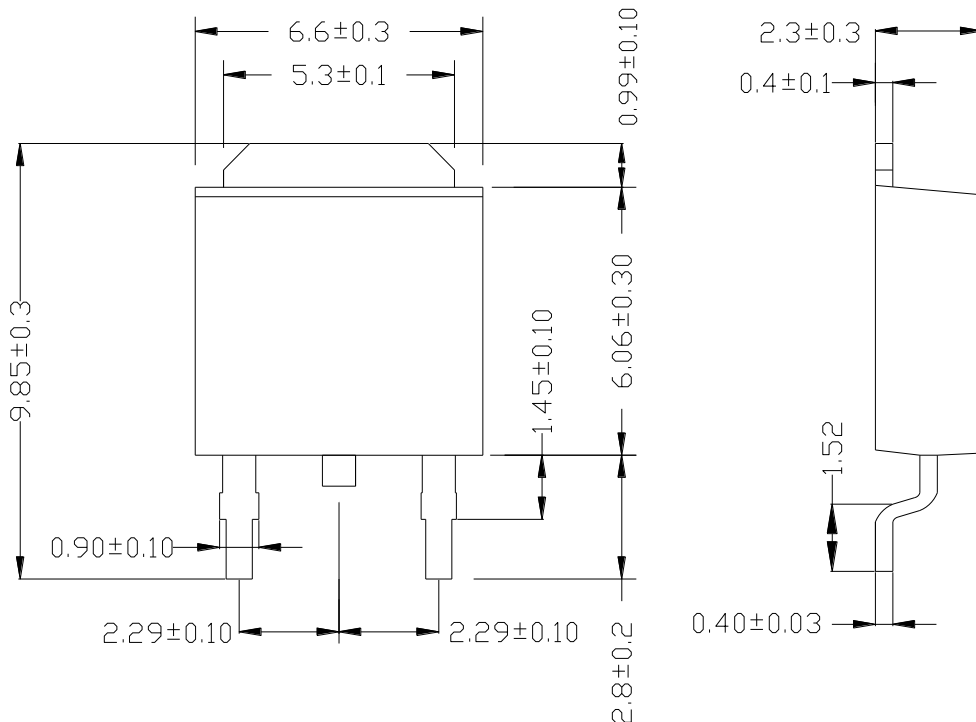


8. 产品外形尺寸图(单位: mm) Package Dimentions(Unit: mm)

T0-251S



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The name and content of poisonous and harmful material in products

Part's Name	Hazardous Substance					
	Pb	Hg	Cd	Cr(VI)	PBB	PBDE
Limit	≤0.1%	≤0.1%	≤0.01%	≤0.1%	≤0.1%	≤0.1%
Lead Frame	○	○	○	○	○	○
Molding Compound	○	○	○	○	○	○
Chip	○	○	○	○	○	○
Wire Bonding	○	○	○	○	○	○
Solder	×	○	○	○	○	○
Note	○: means the hazardous material is under the criterion of SJ/T11363-2006. ×: means the hazardous material exceeds the criterion of SJ/T11363-2006. The plumbum element of solder exist in products presently, but within the allowed range of Eurogroup's RoHS.					

Warnings

1. Exceeding the maximum ratings of the device in performance may cause damage to the device, even the permanent failure, which may affect the dependability of the machine. It is suggested to be used under 80 percent of the maximum ratings of the device.
2. When installing the heatsink, please pay attention to the torsional moment and the smoothness of the heatsink.
3. VDMOSFETs is the device which is sensitive to the static electricity, it is necessary to protect the device from being damaged by the static electricity when using it.
4. This publication is made by Jingdao Electronic and subject to regular change without notice.