



# MT30NC4A

## 主要参数 MAIN CHARACTERISTICS

$I_D$	130A
$V_{DSS}$	30V
$R_{dson-max}$ (@ $V_{gs}=10V$ )	3.1m $\Omega$
$Q_g-typ$	98nC

### 用途

- 电信与工业领域隔离 DC/DC 转换
- 同步整流领域 DC/DC 与 AC/DC 转换

### 产品特性

- 低栅极电荷
- 低  $R_{dson}$
- 开关速度快
- 产品全部经过雪崩测试
- 高抗  $dv/dt$  能力
- RoHS 产品

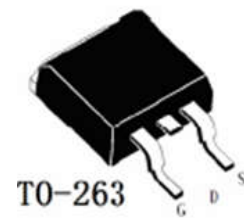
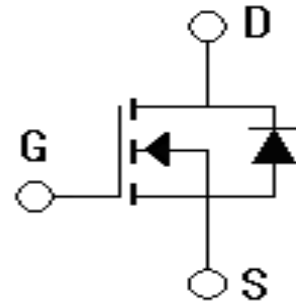
### APPLICATIONS

- Isolated DC/DC Converters in Telecom and Industrial
- Synchronous Rectification in DC/DC and AC/DC Converters

### FEATURES

- Low gate charge
- Low  $R_{dson}$
- Fast switching
- 100% avalanche tested
- Improved  $dv/dt$  capability
- RoHS product

## 封装 Package



## 订货信息 ORDER MESSAGE

订货型号 Order codes				印 记 Marking	封 装 Package
有卤-条管 Halogen-Tube	无卤-条管 Halogen-Free-Tube	有卤-编带 Halogen-Reel	无卤-编带 Halogen-Free-Reel		
MT30NC4A-S-B	MT30NC4A-S-BR	MT30NC4A -S-A	MT30NC4A -S-AR	MT30NC4A	TO-263





## 绝对最大额定值 ABSOLUTE RATINGS (Tc=25°C)

项 目 Parameter	符 号 Symbol	数 值 Value	单 位 Unit
		MT30NC4A	
最高漏极-源极直流电压 Drain-Source Voltage	$V_{DSS}$	30	V
连续漏极电流 Drain Current -continuous	$I_D$ T=25°C	130*	A
	$I_D$ T=100°C	76*	A
最大脉冲漏极电流 (注1) Drain Current - pulse (note 1)	$I_{DM}$	520*	A
最高栅源电压 Gate-Source Voltage	$V_{GSS}$	±20	V
单脉冲雪崩能量 (注2) Single Pulsed Avalanche Energy (note 2)	$E_{AS}$	135	mJ
雪崩电流 (注1) Avalanche Current (note 1)	$I_{AS}$	30	A
耗散功率 Power Dissipation	$P_D$ T <sub>C</sub> =25°C -Derate above 25°C	208	W
		1.67	W/°C
最高结温及存储温度 Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55~+150	°C
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T <sub>L</sub>	300	°C

\*漏极电流由最高结温限制

\*Drain current limited by maximum junction temperature





## 电特性 ELECTRICAL CHARACTERISTICS

项 目 Parameter	符 号 Symbol	测试条件 Tests conditions	最小 Min	典型 Typ	最大 Max	单 位 Units
<b>关态特性 Off –Characteristics</b>						
漏—源击穿电压 Drain-Source Voltage	$BV_{DSS}$	$I_D=250\mu A, V_{GS}=0V$	30	-	-	V
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30V, V_{GS}=0V,$ $T_J=25^\circ C$	-	-	1	$\mu A$
		$V_{DS}=30V, V_{GS}=0V, T_J=55^\circ C$	-	-	5	$\mu A$
正向栅极体漏电流 Gate-body leakage current, forward	$I_{GSSF}$	$V_{DS}=0V, V_{GS}=20V$	-	-	100	nA
反向栅极体漏电流 Gate-body leakage current, reverse	$I_{GSSR}$	$V_{DS}=0V, V_{GS}=-20V$	-	-	-100	nA
<b>通态特性 On-Characteristics</b>						
阈值电压 Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=250\mu A$	1.0	1.7	2.4	V
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D=20A$	-	2.4	3.1	m $\Omega$
		$V_{GS} = 4.5V, I_D=20A$	-	3.2	4.2	m $\Omega$
正向跨导 Forward Transconductance	$g_{fs}$	$V_{DS} = 10V, I_D=20A$ (note 4)	20.8	-	-	S
<b>动态特性 Dynamic Characteristics</b>						
输入电容 Input capacitance	$C_{iss}$	$V_{DS}=15V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	5471	-	pF
输出电容 Output capacitance	$C_{oss}$		-	1628	-	pF
反向传输电容 Reverse transfer capacitance	$C_{rss}$		-	1026	-	pF



**电特性 ELECTRICAL CHARACTERISTICS**

开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{DD}=15V, I_D=50A, R_G=3.0\Omega,$ (note 3, 4)	-	17	-	ns
上升时间 Turn-On rise time	$t_r$		-	41	-	ns
延迟时间 Turn-Off delay time	$t_{d(off)}$		-	55	-	ns
下降时间 Turn-Off Fall time	$t_f$		-	66	-	ns
栅极电荷总量 Total Gate Charge	$Q_g$	$V_{DS}=15V,$ $I_D=50A$ $V_{GS}=10V$ (note 3, 4)	-	98	-	nC
栅-源电荷 Gate-Source charge	$Q_{gs}$		-	11	-	nC
栅-漏电荷 Gate-Drain charge	$Q_{gd}$		-	21	-	nC
漏-源二极管特性及最大额定值 Drain-Source Diode Characteristics and Maximum Ratings						
正向最大连续电流 Maximum Continuous Drain -Source Diode Forward Current	$I_S$	$T_C=25^\circ C$	-	-	130	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current	$I_{SM}$	$T_C=25^\circ C$	-	-	520	A
正向压降 Drain-Source Diode Forward Voltage	$V_{SD}$	$T_J=25^\circ C, V_{GS}=0V, I_{SD}=30A$	-	-	1.2	V
反向恢复时间 Reverse recovery time	$t_{rr}$	$I_S=30A,$ $dI_F/dt=100A/\mu s$ (note 3)	-	27	-	ns
反向恢复电荷 Reverse recovery charge	$Q_{rr}$		-	25	-	nC

**热特性 THERMAL CHARACTERISTIC**

项 目 Parameter	符 号 Symbol	最大 Max	单 位 Unit
		MT30NC4A	
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.6	$^\circ C/W$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	62.5	$^\circ C/W$

注释:

- 1: 脉冲宽度由最高结温限制
- 2:  $V_{DD}=30V, V_{GS}=10V, L=0.3mH, R_G=25\Omega$ , 起始结温  $T_J=25^\circ C$
- 3: 脉冲测试: 脉冲宽度 $\leq 300\mu s$ , 占空比 $\leq 2\%$
- 4: 基本与工作温度无关

Notes:

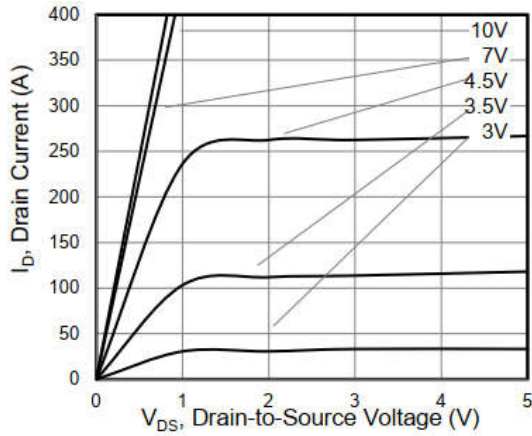
- 1: Pulse width limited by maximum junction temperature
- 2:  $V_{DD}=30V, V_{GS}=10V, L=0.3mH, R_G=25\Omega$ , Starting  $T_J=25^\circ C$
- 3: Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$
- 4: Essentially independent of operating temperature



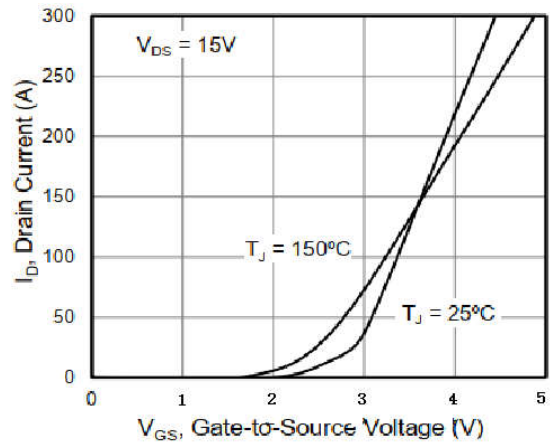


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

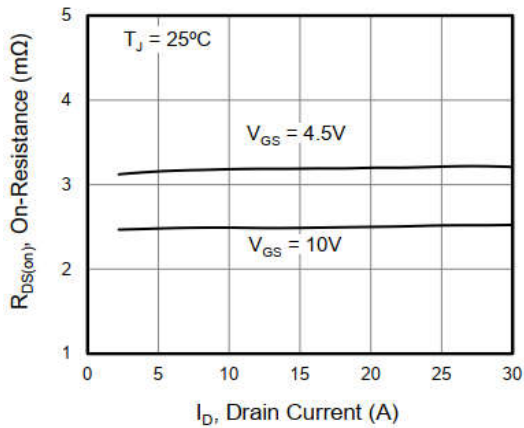
On-Region Characteristics



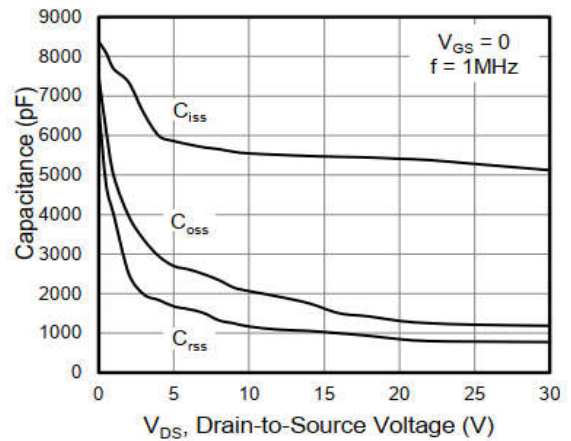
Transfer Characteristics



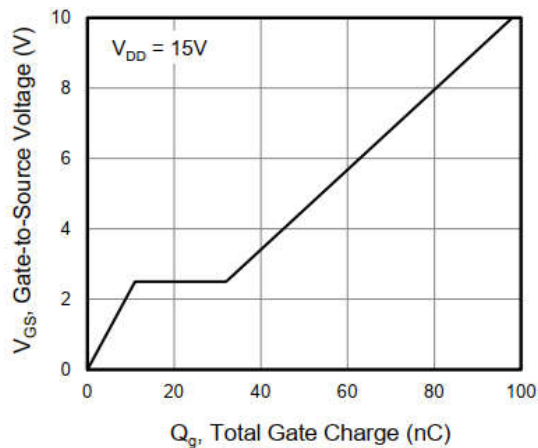
On-Resistance Variation vs. Drain Current and Gate Voltage



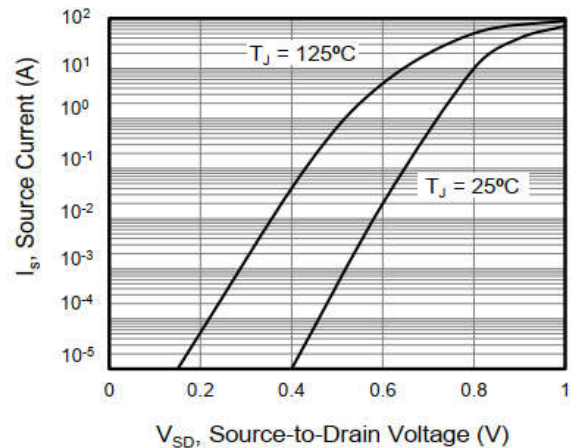
Capacitance Characteristics



Gate Charge Characteristics

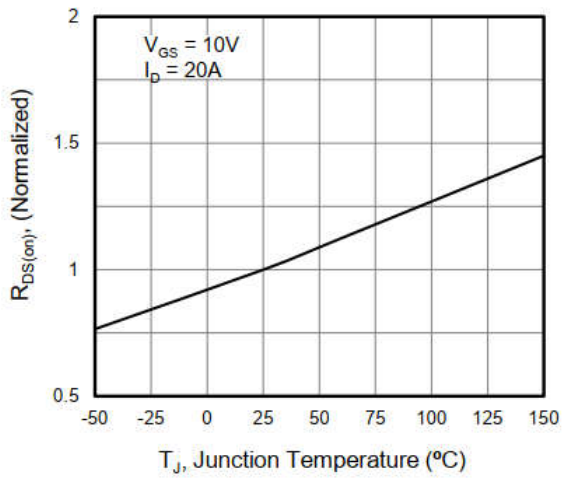


Body Diode Forward Voltage Variation vs. Source Current and Temperature

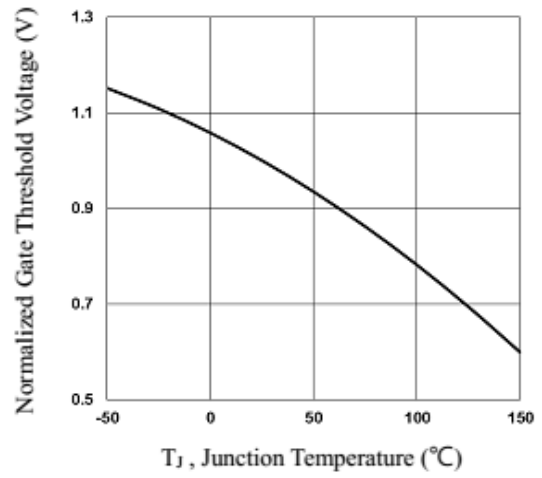




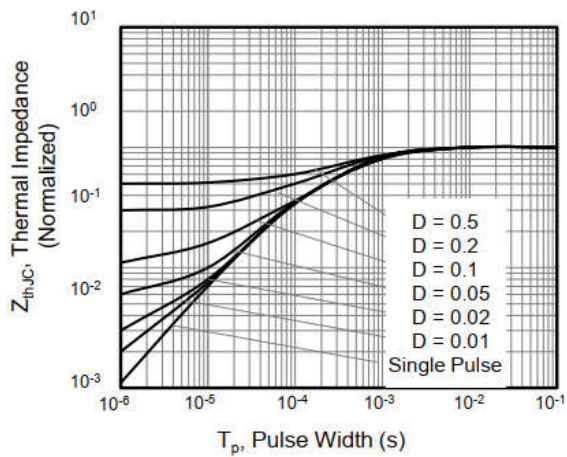
**On-Resistance Variation vs. Junction Temperature**



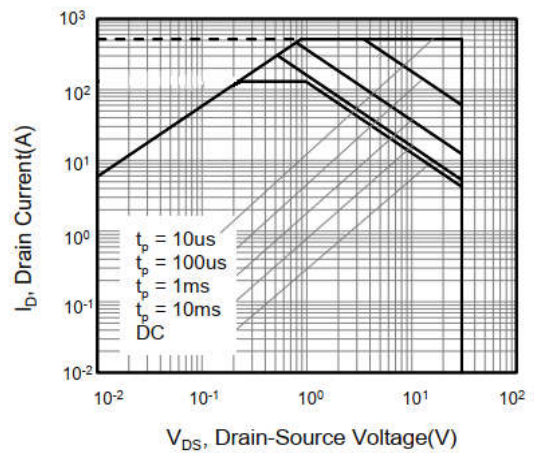
**Threshold Voltage Variation vs. Junction Temperature**



**Transient Thermal Impedance**



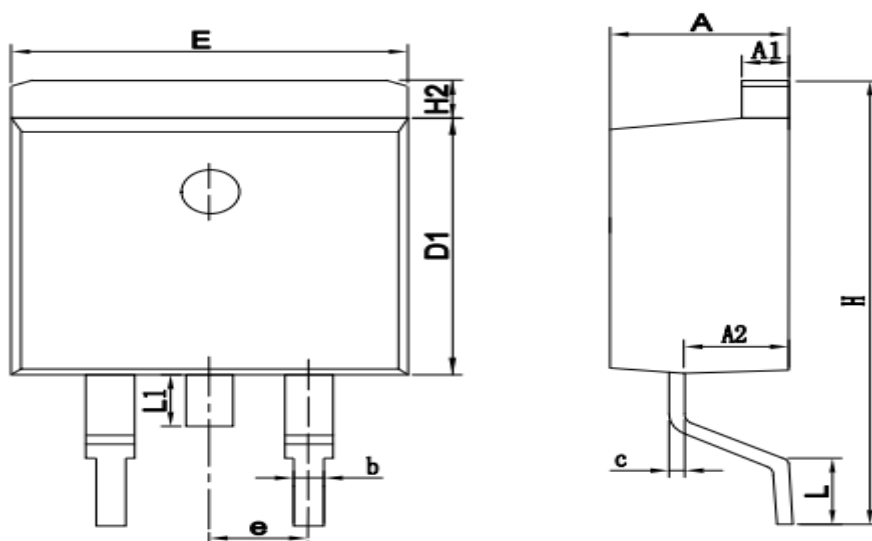
**Maximum Safe Operation**





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单位 Unit: mm



SYMBOL	MM	
	MIN	MAX
A	4.30	4.80
A1	1.12	1.42
A2	2.54	2.84
b	0.67	1.00
c	0.29	0.52
D1	8.40	9.00
E	9.80	10.46
e	2.54BSC	
H	14.00	16.00
H2	1.12	1.45
L	1.50	3.10
L1	1.45	1.70



**注意事项**

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**联系方式****吉林华微电子股份有限公司**

公司地址：吉林省吉林市深圳街 99 号

邮编：132013

总机：86-432-64678411

传真：86-432-64665812

网址：[www.hwdz.com.cn](http://www.hwdz.com.cn)

**市场营销部**

地址：吉林省吉林市深圳街 99 号

邮编：132013

电话：86-432-64675588

64675688

64678411

传真：86-432-64671533

**CONTACT****JILIN SINO-MICROELECTRONICS CO., LTD.**

ADD: No.99 Shenzhen Street, Jilin City, Jilin Province, China.

Post Code: 132013

Tel: 86-432-64678411

Fax: 86-432-64665812

Web Site: [www.hwdz.com.cn](http://www.hwdz.com.cn)

**MARKET DEPARTMENT**

ADD: No.99 Shenzhen Street, Jilin City, Jilin Province, China.

Post Code: 132013

Tel: 86-432-64675588

64675688

64678411

Fax: 86-432-64671533

