



# MT28N20A

## 主要参数 MAIN CHARACTERISTICS

$I_D$	28A
$V_{DSS}$	200V
$R_{dson-max}$ (@ $V_{gs}=10V$ )	85m $\Omega$
$Q_g-typ$	52nC

### 用途

- 电信与工业领域隔离 DC/DC 转换
- 同步整流领域
- 汽车应用
- 不间断电源

### 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

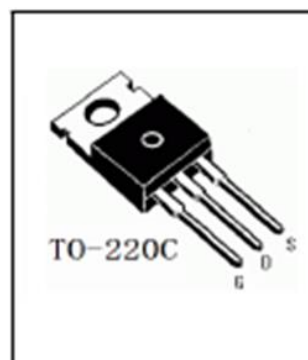
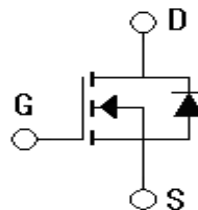
### APPLICATIONS

- Isolated DC/DC Converters in Telecom and Industrial
- Synchronous Rectification
- Automotive
- UPS

### 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		
MT28N20A-C-B	MT28N20A-C-BR	N/A	N/A	MT28N20A	TO-220C



绝对最大额定值 ABSOLUTE RATINGS ( $T_c=25^\circ\text{C}$ )

项 目 Parameter	符 号 Symbol	数 值 Value	单 位 Unit
		MT28N20A	
最高漏极-源极直流电压 Drain-Source Voltage	$V_{DSS}$	200	V
连续漏极电流 Drain Current -continuous	$I_D$ $T=25^\circ\text{C}$	28*	A
	$I_D$ $T=100^\circ\text{C}$	22*	A
最大脉冲漏极电流 (注1) Drain Current - pulse (note 1)	$I_{DM}$	112*	A
最高栅源电压 Gate-Source Voltage	$V_{GSS}$	+30/-30V	V
单脉冲雪崩能量 (注2) Single Pulsed Avalanche Energy (note 2)	$E_{AS}$	150	mJ
雪崩电流 (注1) Avalanche Current (note 1)	$I_{AS}$	38	A
耗散功率 Power Dissipation	$P_D$ $T_c=25^\circ\text{C}$ -Derate above $25^\circ\text{C}$	208	W
		1.66	W/ $^\circ\text{C}$
最高结温及存储温度 Operating and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	$T_L$	300	$^\circ\text{C}$

\*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	$BV_{DSS}$	$I_D=250\mu A, V_{GS}=0V$	200	-	-	V
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=200V, V_{GS}=0V,$ $T_C=25^\circ C$	-	-	10	$\mu A$
		$V_{DS}=160V, V_{GS}=0V,$ $T_C=100^\circ C$	-	-	200	$\mu A$
正向栅极体漏电流 Gate-body leakage current, forward	$I_{GSSF}$	$V_{DS}=0V, V_{GS}=30V$	-	-	100	nA
反向栅极体漏电流 Gate-body leakage current, reverse	$I_{GSSR}$	$V_{DS}=0V, V_{GS}=-30V$	-	-	-100	nA
<b>通态特性 On-Characteristics</b>						
阈值电压 Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=250\mu A$	3.5	4.5	5.5	V
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=28A$	-	60	85	m $\Omega$
<b>动态特性 Dynamic Characteristics</b>						
输入电容 Input capacitance	$C_{iss}$	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	3000	-	pF
输出电容 Output capacitance	$C_{oss}$		-	240	-	pF
反向传输电容 Reverse transfer capacitance	$C_{rss}$		-	90	-	pF
栅电阻 Gate resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V,$ $F=1MHz$	-	1.4	-	$\Omega$





## 电特性 ELECTRICAL CHARACTERISTICS

开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	$t_d(\text{on})$	$V_{DD}=100V, I_D=14A, R_G=25\Omega$ $V_{GS}=10V$ (note 3, 4)	-	58	-	ns
上升时间 Turn-On rise time	$t_r$		-	104	-	ns
延迟时间 Turn-Off delay time	$t_d(\text{off})$		-	74	-	ns
下降时间 Turn-Off Fall time	$t_f$		-	58	-	ns
栅极电荷总量 Total Gate Charge	$Q_g$	$V_{DS}=100V,$ $I_D=14A$ $V_{GS}=10V$ (note 3, 4)	-	52	-	nC
栅-源电荷 Gate-Source charge	$Q_{gs}$		-	22	-	nC
栅-漏电荷 Gate-Drain charge	$Q_{gd}$		-	19	-	nC
漏-源二极管特性及最大额定值 Drain-Source Diode Characteristics and Maximum Ratings						
正向压降 Drain-Source Diode Forward Voltage	$V_{SD}$	$T_J=25^\circ\text{C}, V_{GS}=0V, I_S=28A$ $V_G=V_D=0V, \text{force current}$	-	-	1.2	V
正向连续电流 Diode continuous forward current	$I_S$				28	A
正向脉冲电流 Diode pulse current	$I_{SM}$				112	A

## 热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	最大 Max	单 位 Unit
		MT28N20A	
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	0.60	$^\circ\text{C/W}$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	62.5	$^\circ\text{C/W}$

注释:

- 1: 脉冲宽度由最高结温限制
- 2:  $V_{DD}=25V, L=0.1mH, R_G=25\Omega, I_{AS}=28A$  起始结温  $T_J=25^\circ\text{C}$
- 3: 脉冲测试: 脉冲宽度 $\leq 300\mu\text{s}$ , 占空比 $\leq 2\%$
- 4: 基本与工作温度无关

Notes:

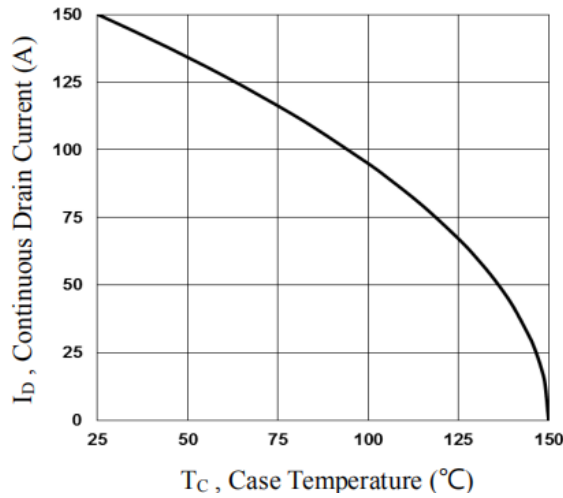
- 1: Pulse width limited by maximum junction temperature
- 2:  $V_{DD}=25V, L=0.1mH, R_G=25\Omega, I_{AS}=28A$  Starting  $T_J=25^\circ\text{C}$
- 3: Pulse Test: Pulse Width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$
- 4: Essentially independent of operating temperature



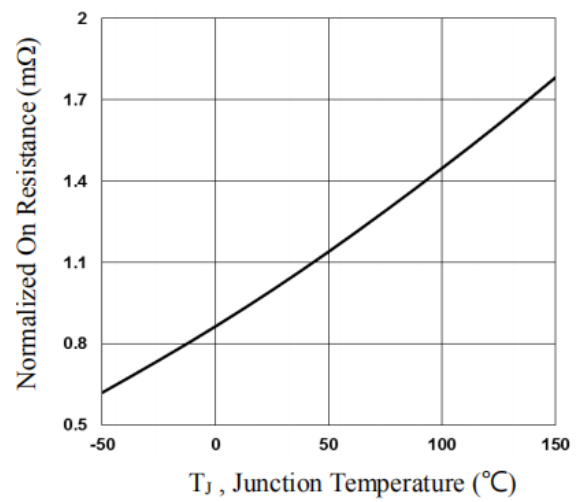


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

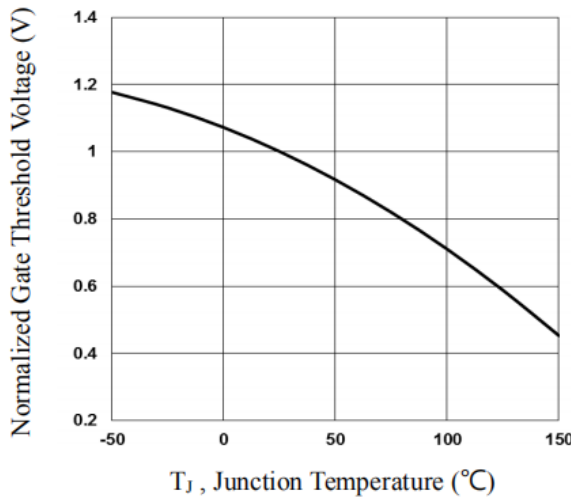
Continuous Drain Current vs Tc



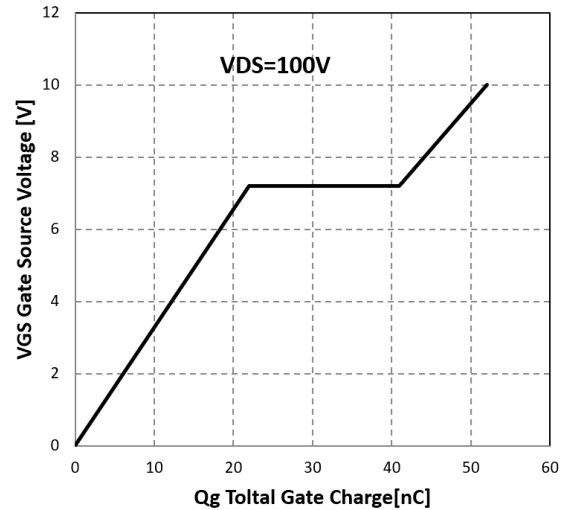
Normalized Rdson vs. Tj



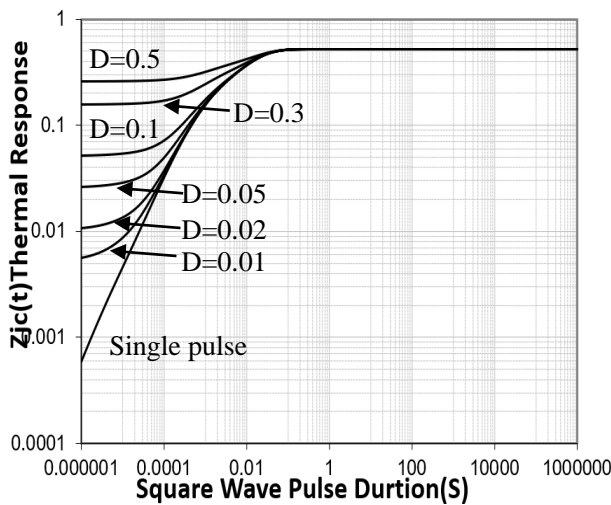
Normalized Vth vs. Tj



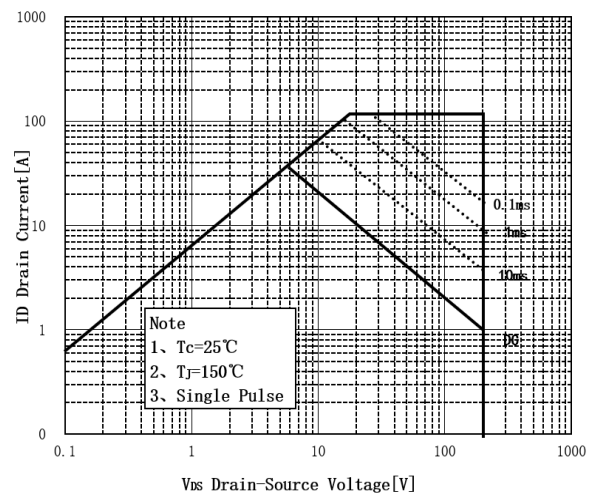
Gate Charge Characteristics



On-Region Characteristics



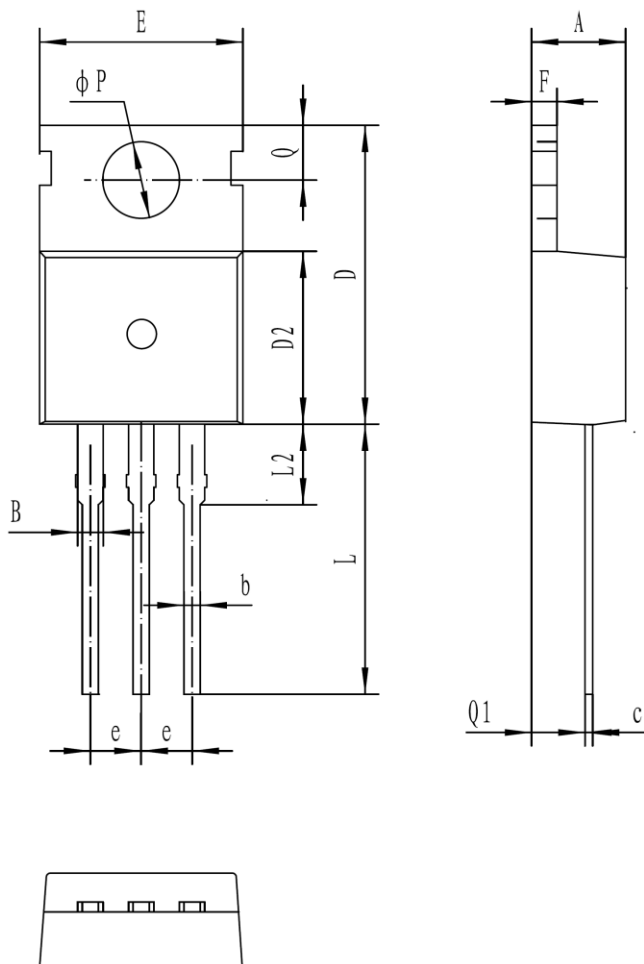
Maximum Safe Operation Area





TO-220C

单位 Unit: mm



符号 symbol	MIN	MAX
A	4.30	4.70
B	1.10	1.40
b	0.70	0.95
c	0.40	0.65
D	15.20	16.20
D2	9.00	9.40
E	9.70	10.10
e	2.39	2.69
F	1.25	1.40
L	12.60	13.60
L2	2.80	3.20
Q	2.60	3.00
Q1	2.20	2.60
P	3.50	3.80





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