



MP4N60ER

主要参数 MAIN CHARACTERISTICS

I_D	4A
V_{DSS}	600V
$R_{dson-max}$ ($V_{GS}=10V$)	2.5 Ω
Q_g-Typ	13nC

用途

- 高频开关电源
- 电子镇流器
- LED 电源

产品特性

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

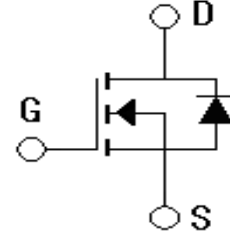
APPLICATIONS

- High efficiency switch mode power supplies
- Electronic lamp ballasts based on half bridge
- LED power supplies

FEATURES

- Low gate charge
- 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		
N/A	MP4N60ER-R-BR	N/A	MP4N60ER-R-AR	MP4N60ER	DPAK

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
最高漏极-源极直流电压 Drain-Source Voltage	V_{DSS}	600	V
连续漏极电流 Drain Current-continuous	I_D $T=25^\circ\text{C}$ $T=100^\circ\text{C}$	4	A
		2.4	A
最大脉冲漏极电流 (注1) Drain Current – pulse (note 1)	I_{DM}	16	A
最高栅源电压 Gate-Source Voltage	V_{GSS}	± 30	V
单脉冲雪崩能量 (注2) Single Pulsed Avalanche Energy (note 2)	E_{AS}	20	mJ
耗散功率 Power Dissipation	P_D $T_c=25^\circ\text{C}$ -Derate above 25°C	120	W
		0.96	W/ $^\circ\text{C}$
最高结温及存储温度 Operating and Storage Temperature Range	T_J, T_{STG}	150; $-55\sim+150$	$^\circ\text{C}$
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
关态特性 Off –Characteristics						
漏-源击穿电压 Drain-Source Voltage	BV_{DSS}	$I_D=250\mu A, V_{GS}=0V$	600	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	$I_D=250\mu A$, referenced to 25°C	-	0.6	-	V/°C
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=600V, V_{GS}=0V, T_C=25^\circ C$	-	-	1	μA
		$V_{DS}=480V, V_{GS}=0V, T_C=125^\circ C$	-	-	100	μA
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
通态特性 On-Characteristics						
阈值电压 Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=250\mu A$	2	-	4	V
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=2.0A$ 25°C	-	2.2	2.5	Ω
正向跨导 Forward Transconductance	g_{fs}	$V_{DS}=40V, I_D=2.0A$ (note 4)	-	7.2	-	S
动态特性 Dynamic Characteristics						
栅极电阻 Gate resistance	R_g	F=1.0MHz open drain	1.5	2.3	3.5	Ω
输入电容 Input capacitance	C_{iss}	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	520	-	pF
输出电容 Output capacitance	C_{oss}		-	60	-	pF
反向传输电容 Reverse transfer capacitance	C_{rss}		-	3	-	pF





电特性 ELECTRICAL CHARACTERISTICS

开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	$t_{d(on)}$	$V_{DD}=300V, I_D=4A, R_G=25\Omega$ (note 4, 5)	-	10	-	ns
上升时间 Turn-On rise time	t_r		-	23.6	-	ns
延迟时间 Turn-Off delay time	$t_{d(off)}$		-	31.8	-	ns
下降时间 Turn-Off Fall time	t_f		-	25.4	-	ns
栅极电荷总量 Total Gate Charge	Q_g	$V_{DS}=480V,$ $I_D=4A$ $V_{GS}=10V$ (note 4, 5)	-	13	-	nC
栅-源电荷 Gate-Source charge	Q_{gs}		-	4.2	-	nC
栅-漏电荷 Gate-Drain charge	Q_{gd}		-	3.4	-	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	-	-	4	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}	-	-	16	A
正向压降 Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V,$ $I_S=4A$	-	-	1.40	V
反向恢复时间 Reverse recovery time	t_{rr}	$V_{GS}=0V, I_S=4A$ $di/dt=100A/\mu s$ (note 4)	-	54.6	-	ns
反向恢复电荷 Reverse recovery charge	Q_{rr}		-	55	-	nC

热特性 THERMAL CHARACTERISTIC

项目 Parameter	符号 Symbol	数值 Value	单位 Unit
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-c)}$	1	$^{\circ}C/W$
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	103	$^{\circ}C/W$

注释:

- 1: 脉冲宽度由最高结温限制
- 2: $L=0.5mH, I_{AS}=9A, V_{DD}=50V, R_G=25\Omega$, 起始结温 $T_J=25^{\circ}C$
- 3: $I_{SD} \leq 20A, di/dt \leq 300A/\mu s, V_{DD} \leq BV_{DSS}$, 起始结温 $T_J=25^{\circ}C$
- 4: 脉冲测试: 脉冲宽度 $\leq 300\mu s$, 占空比 $\leq 2\%$
- 5: 基本与工作温度无关

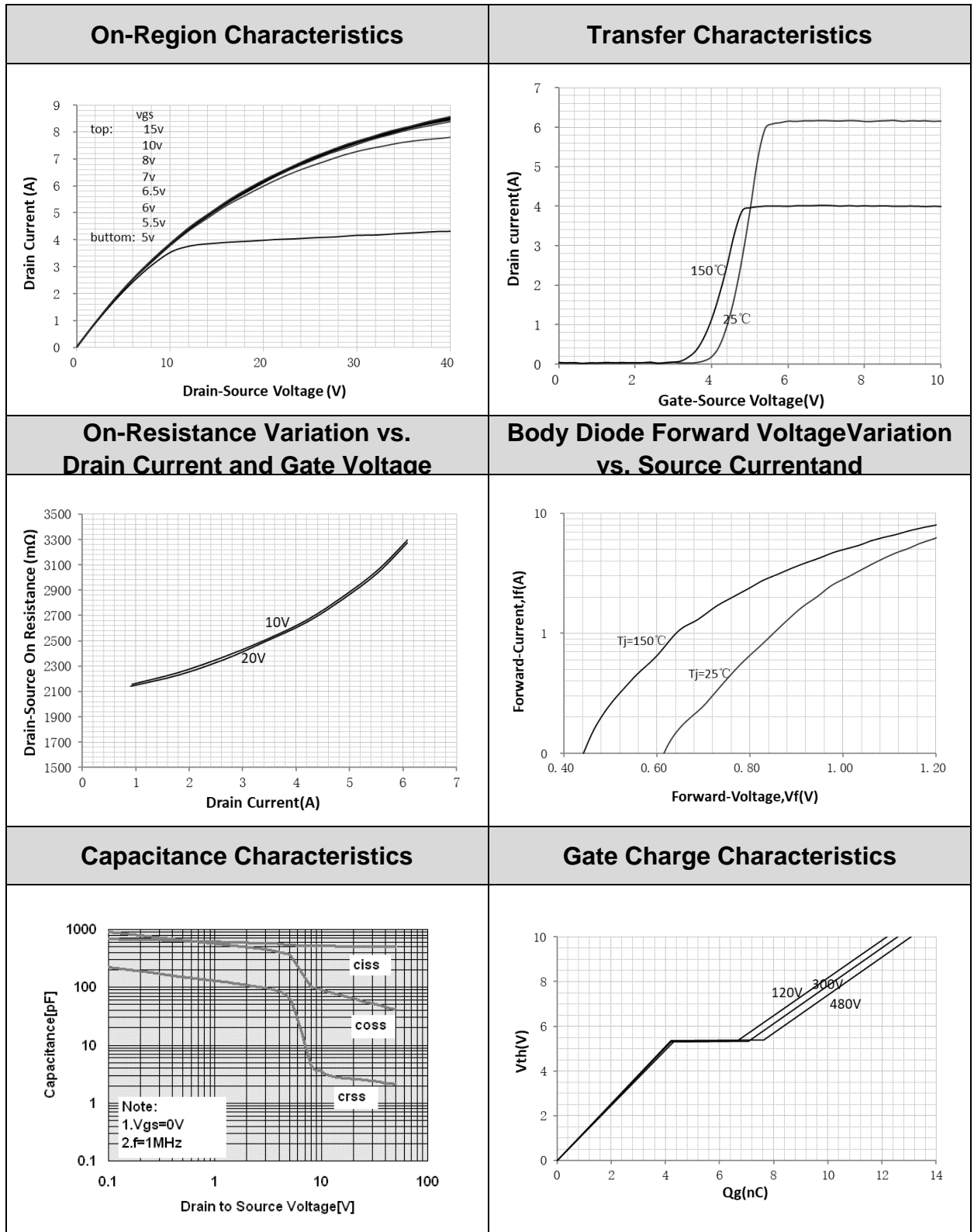
Notes:

- 1: Pulse width limited by maximum junction temperature
- 2: $L=0.5mH, I_{AS}=9A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^{\circ}C$
- 3: $I_{SD} \leq 20A, di/dt \leq 300A/\mu s, V_{DD} \leq BV_{DSS}$, Starting $T_J=25^{\circ}C$
- 4: Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycles $\leq 2\%$
- 5: Essentially independent of operating temperature



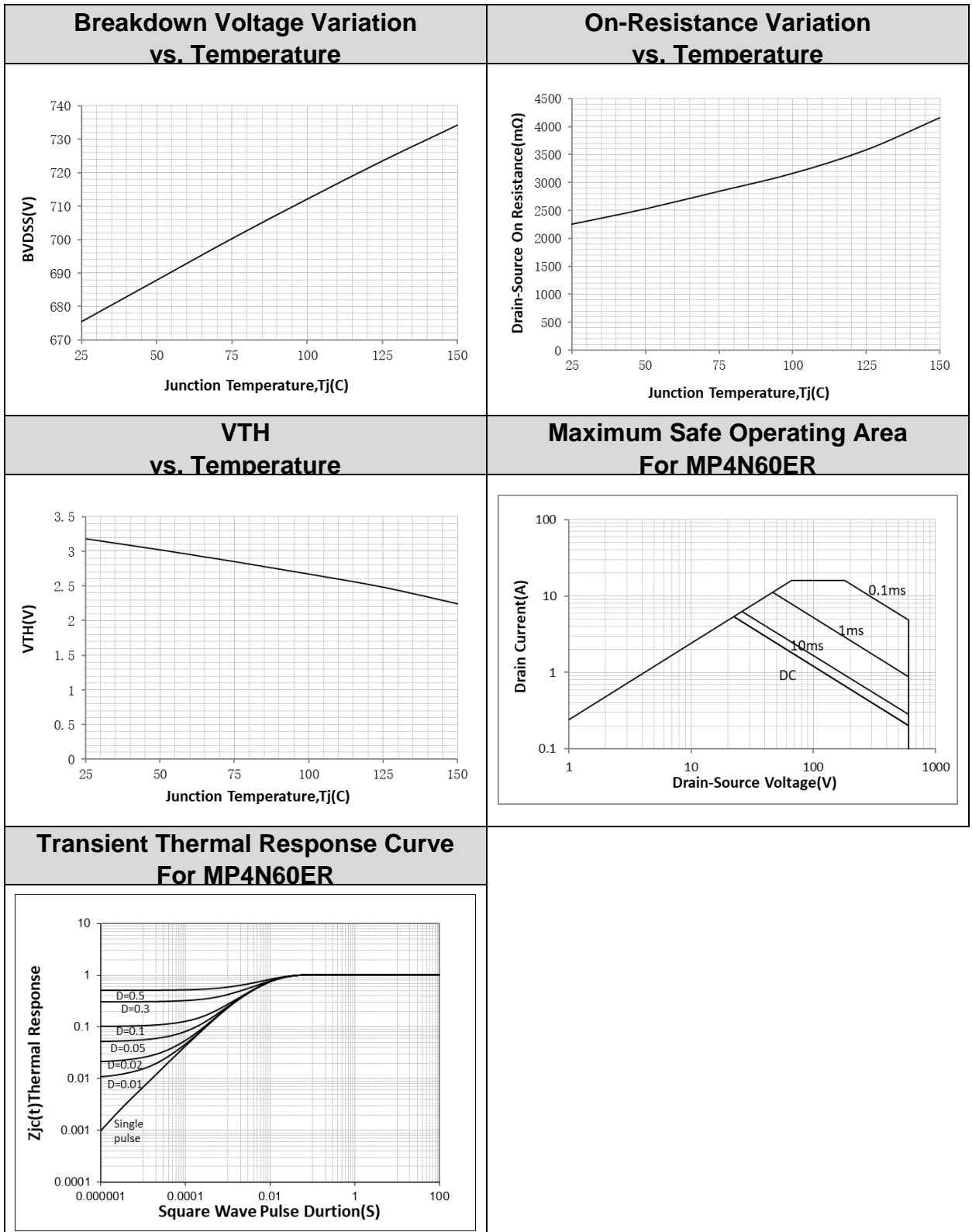


特征曲线ELECTRICAL CHARACTERISTICS (curves)





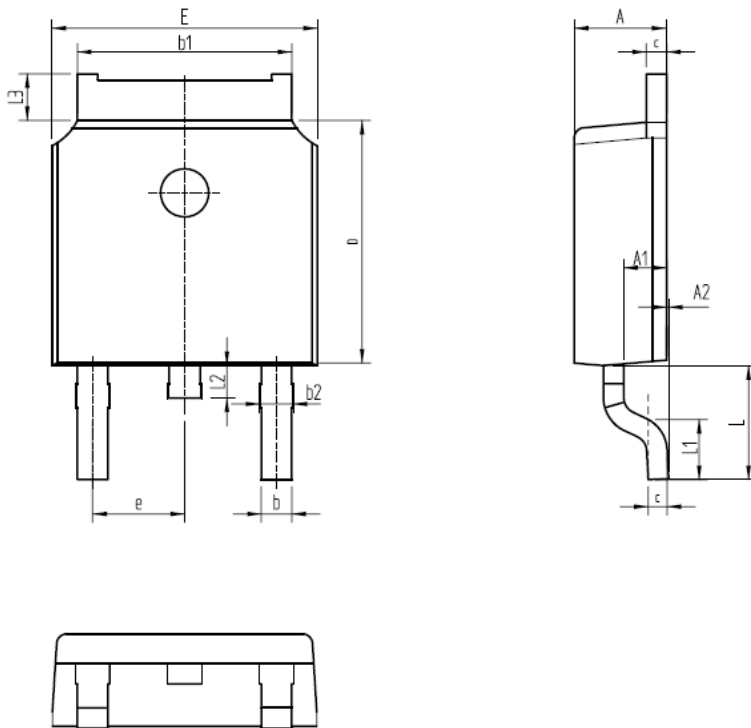
特征曲线ELECTRICAL CHARACTERISTICS (curves)





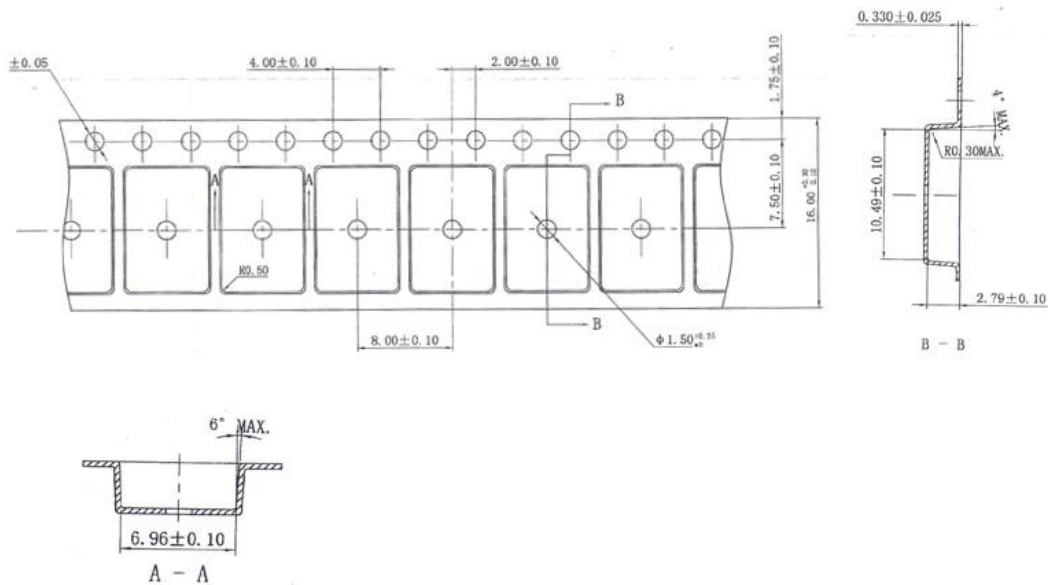
外形尺寸 PACKAGE MECHANICAL DATA
DPAK

单位 Unit: mm



SYMBOL	mm	
	MIN	MAX
A	2.16	2.41
A1	0.97	1.17
A2	0.00	0.15
b	0.63	0.93
b1	5.13	5.53
b2	0.66	0.96
c	0.40	0.60
D	5.80	6.40
E	6.30	6.90
e	2.286BSC	
L	2.50	3.30
L1	1.20	1.80
L2	0.60	1.00
L3	0.85	1.30

编带 REEL





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