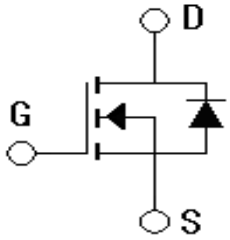
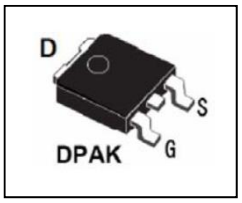
MP4N60ER

主要参数MAIN CHARACTERISTICS

I_D	4A
V_{DSS}	600V
Rdson-max （Vgs=10V）	2.5Ω
Qg-Typ	13nC

封装 **Package**





用途

- 高频开关电源
- 电子镇流器
- LED 电源

APPLICATIONS

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

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

FEATURES

- Low gate charge
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability
- RoHS product

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(Tc=25℃)

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℃	4	A
	T=100℃	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℃	120	W
	-Derate above 25℃	0.96	W/℃
最高结温及存储温度 Operating and StorageTemperatureRange	T_J，T_{STG}	150；-55～+150	℃
引线最高焊接温度 Maximum Lead Temperature for Soldering Purposes	T_L	300	℃

*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=250μA, V_{GS}=0V	600	-	-	V
击穿电压温度特性 Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	I_D=250μA, referenced to 25℃	-	0.6	-	V/℃
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℃	-	-	1	μA
		V_{DS}=480V,V_{GS}=0V, T_C=125℃	-	-	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=250μA	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℃	-	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	Rg	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=25Ω （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_F/dt=100A/μs (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	℃/W
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	103	℃/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 Ω,起始结温 T_J=25℃

3：I_{SD} ≤20A,di/dt ≤300A/μs,VDD≤BV_{DSS},起始结温 T_J=25℃

4：脉冲测试：脉冲宽度≤300μs,占空比≤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 Ω,Starting T_J=25℃

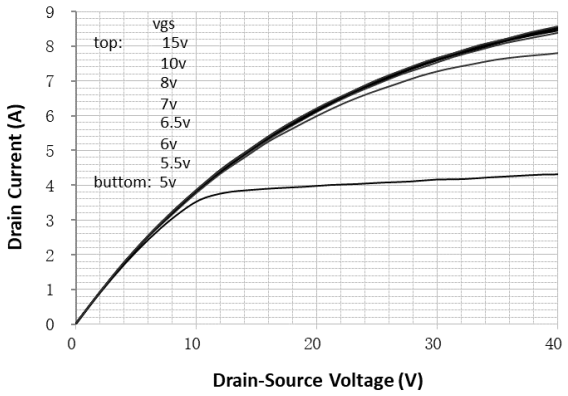
3：I_{SD} ≤20A,di/dt ≤300A/μs,VDD≤BV_{DSS}, Starting T_J=25℃

4：Pulse Test：Pulse Width ≤300μs,Duty Cycle≤2%

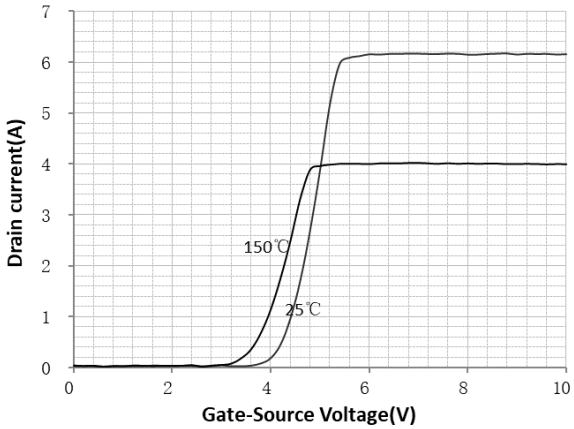
5：Essentially independent of operating temperature

特征曲线ELECTRICAL CHARACTERISTICS (curves)

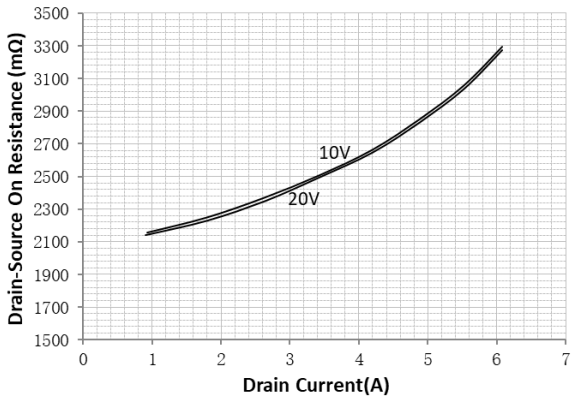
On-Region Characteristics



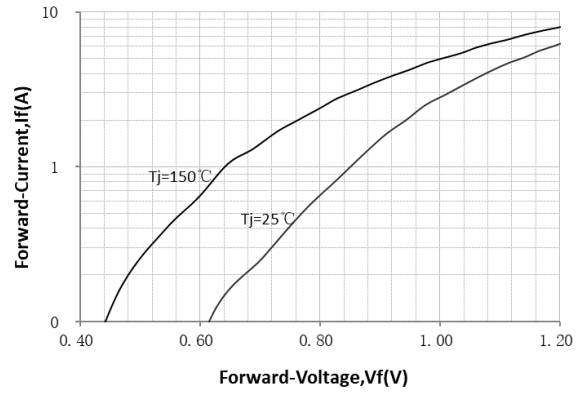
Transfer Characteristics



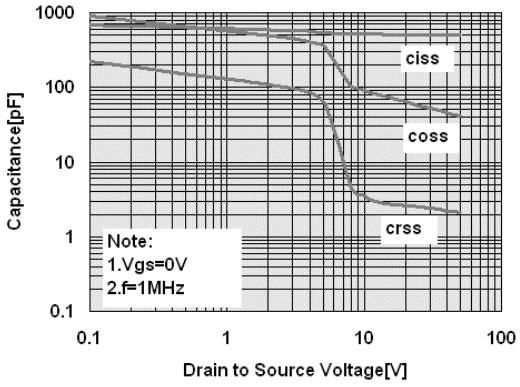
On-Resistance Variation vs. Drain Current and Gate Voltage



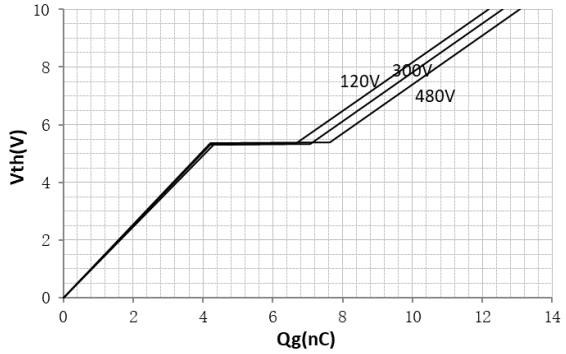
Body Diode Forward VoltageVariation vs. Source Currentand



Capacitance Characteristics

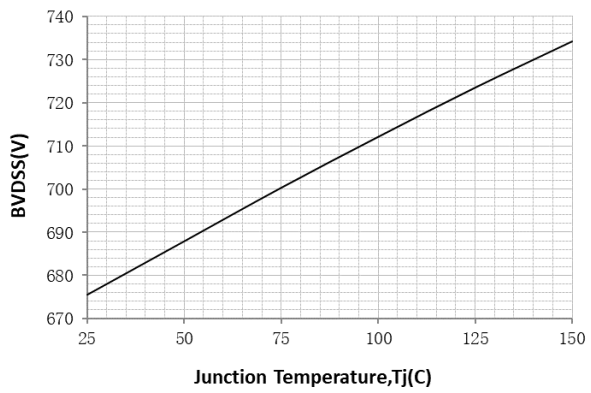


Gate Charge Characteristics

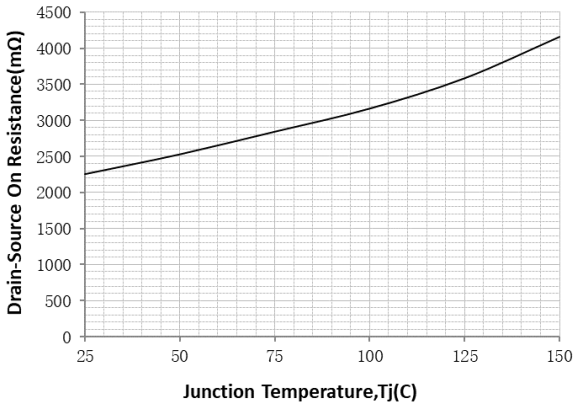


特征曲线ELECTRICAL CHARACTERISTICS (curves)

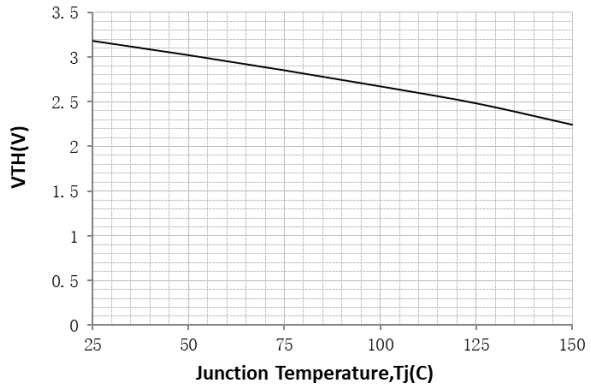
Breakdown Voltage Variation vs. Temperature



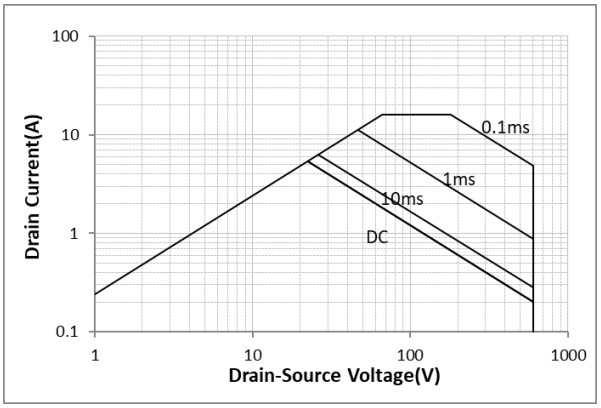
On-Resistance Variation vs. Temperature



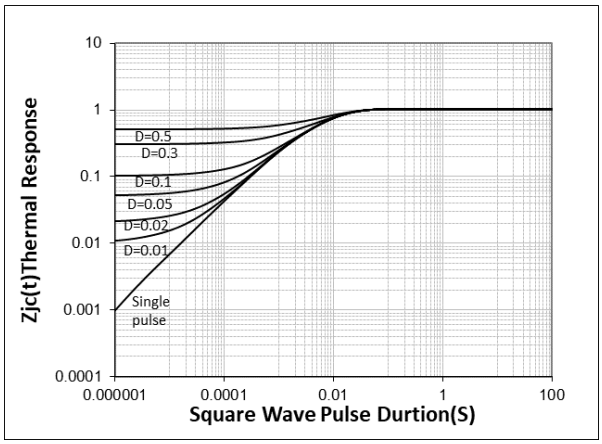
VTH vs. Temperature



Maximum Safe Operating Area For MP4N60ER



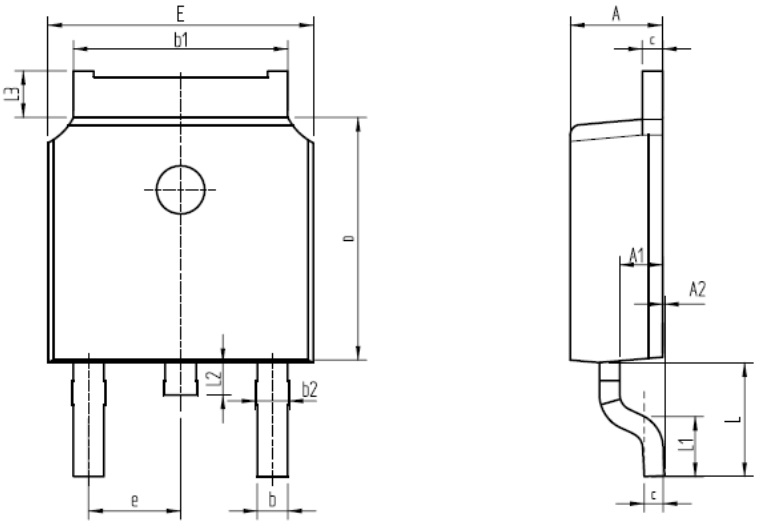
Transient Thermal Response Curve For MP4N60ER



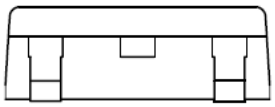
外形尺寸 PACKAGE MECHANICAL DATA

DPAK

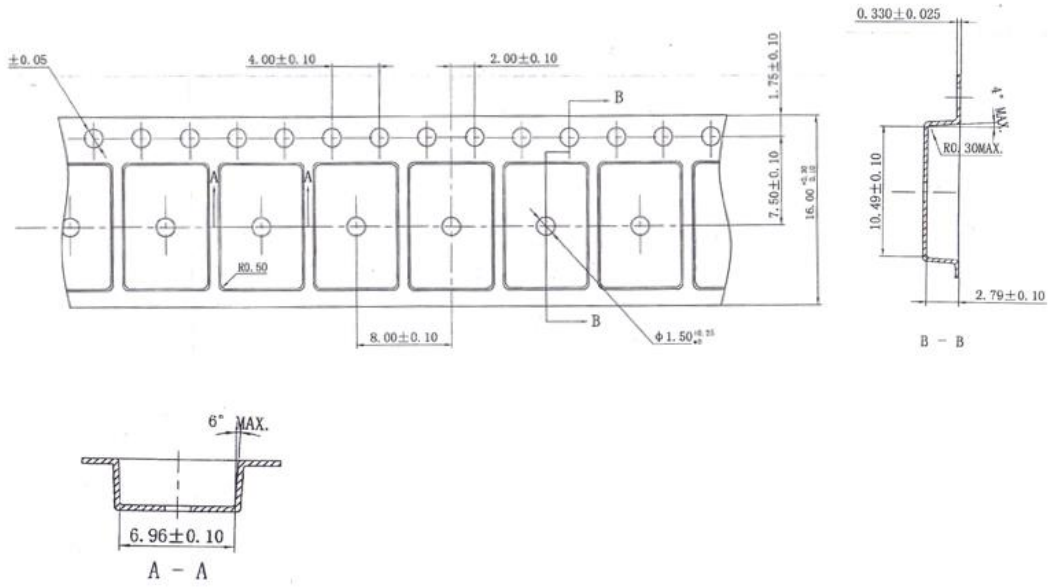
单位 Unit：mm



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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