



MC40N11A

主要参数 MAIN CHARACTERISTICS

I_D	8.0A
V_{DSS}	40V
$R_{dson-max}$ (@ $V_{gs}=10V$)	13.5m Ω
Q_g-typ	6.9nC

用途

- LED 应用
- 负载开关

- 同步整流领域 DC/DC 与 AC/DC 转换

产品特性

- 沟槽功率 MOSFET 技术
- 低 $R_{DS(ON)}$
- 低栅极电荷
- 开关速度快

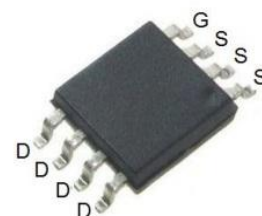
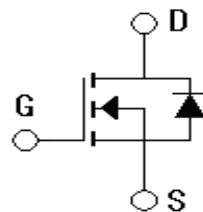
APPLICATIONS

- LED applications
- Load Switch
- Synchronous Rectification in DC/DC and AC/DC Converters

FEATURES

- Trench Power MOSFET Technology
- Low $R_{DS(ON)}$
- Low gate charge
- Fast-switching

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	N/A	N/A	MC40N11A-L-AR	MC40N11A	SOP-8



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
		MC40N11A	
最高漏极-源极直流电压 Drain-Source Voltage	V_{DSS}	40	V
连续漏极电流 Drain Current -continuous	I_D $T=25^\circ\text{C}$	8*	A
	I_D $T=100^\circ\text{C}$	6.4*	A
最大脉冲漏极电流 (注1) Drain Current - pulse (note 1)	I_{DM}	32*	A
最高栅源电压 Gate-Source Voltage	V_{GSS}	+20/-12	V
单脉冲雪崩能量 (注2) Single Pulsed Avalanche Energy (note 2)	E_{AS}	24	mJ
雪崩电流 (注1) Avalanche Current (note 1)	I_{AS}	22	A
耗散功率 Power Dissipation	P_D $T_c=25^\circ\text{C}$ -Derate above 25°C	1.4	W
		0.12	W/°C
最高结温及存储温度 Operating and Storage Temperature Range	T_J, T_{STG}	-55~+150	°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}	$I_D=250\mu A, V_{GS}=0V$	40	-	-	V
零栅压下漏极漏电流 Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V,$ $T_C=25^\circ C$	-	-	1	μA
		$V_{DS}=32V, V_{GS}=0V, T_C=85^\circ C$	-	-	10	μA
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}	$V_{DS}=0V, V_{GS}=-12V$	-	-	-100	nA
通态特性 On-Characteristics						
阈值电压 Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D=250\mu A$	1.0	1.5	2.5	V
静态导通电阻 Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D=4A$	-	11	13.5	m Ω
		$V_{GS} = 4.5V, I_D=3A$	-	18	22	m Ω
正向跨导 Forward Transconductance	g_{fs}	$V_{DS} = 10V, I_D=1A$ (note 4)	-	4	-	S
动态特性 Dynamic Characteristics						
输入电容 Input capacitance	C_{iss}	$V_{DS}=25V,$ $V_{GS}=0V,$ $f=1.0MHz$	-	450	900	pF
输出电容 Output capacitance	C_{oss}		-	210	420	pF
反向传输电容 Reverse transfer capacitance	C_{rss}		-	27	54	pF
栅电阻 Gate resistance	R_g	$V_{DS}=0V, V_{GS}=0V, f=1.0MHz$		2.8		Ω





电特性 ELECTRICAL CHARACTERISTICS

开关特性 Switching Characteristics						
延迟时间 Turn-On delay time	$t_d(\text{on})$	$V_{DD}=20V, I_D=1A, R_G=1\Omega$ (note 3, 4)	-	3.9	7.8	ns
上升时间 Turn-On rise time	t_r		-	18.1	38	ns
延迟时间 Turn-Off delay time	$t_d(\text{off})$		-	16.2	32	ns
下降时间 Turn-Off Fall time	t_f		-	57.5	116	ns
栅极电荷总量 Total Gate Charge	Q_g	$V_{DS}=20V,$ $I_D=4A$ $V_{GS}=10V$ (note 3, 4)	-	6.9	14	nC
栅-源电荷 Gate-Source charge	Q_{gs}		-	0.6	1.2	nC
栅-漏电荷 Gate-Drain charge	Q_{gd}		-	3.2	6.4	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	$T_C=25^\circ\text{C}$	-	-	8	A
正向最大脉冲电流 Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	$T_C=25^\circ\text{C}$	-	-	32	A
正向压降 Drain-Source Diode Forward Voltage	V_{SD}	$T_J=25^\circ\text{C}, V_{GS}=0V, I_S=1A$	-	-	1.0	V

热特性 THERMAL CHARACTERISTIC

项 目 Parameter	符 号 Symbol	最大 Max	单 位 Unit
		MC40N11A	
结到环境的热阻 Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	85	$^\circ\text{C}/\text{W}$
结到管壳的热阻 Thermal Resistance, Junction to Case	$R_{th(j-C)}$	25	$^\circ\text{C}/\text{W}$

注释:

- 1: 脉冲宽度由最高结温限制
- 2: $I_{AS}=22A, V_{DD}=25V, V_{GS}=10V, L=0.1mH,$
 $R_G=25\Omega, \text{起始结温 } T_J=25^\circ\text{C}$
- 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:

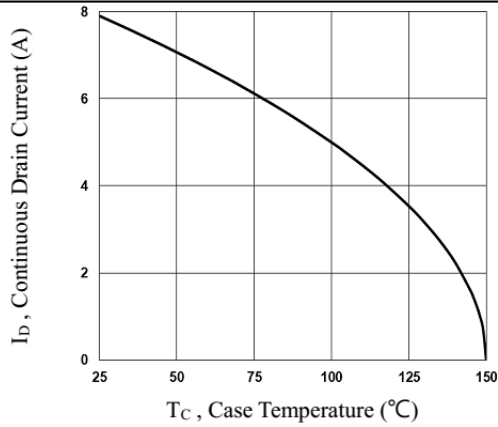
- 1: Pulse width limited by maximum junction temperature
- 2: $I_{AS}=22A, V_{DD}=25V, V_{GS}=10V, L=0.1mH,$
 $R_G=25\Omega, \text{Starting } T_J=25^\circ\text{C}$
- 3: Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
- 4: Essentially independent of operating temperature



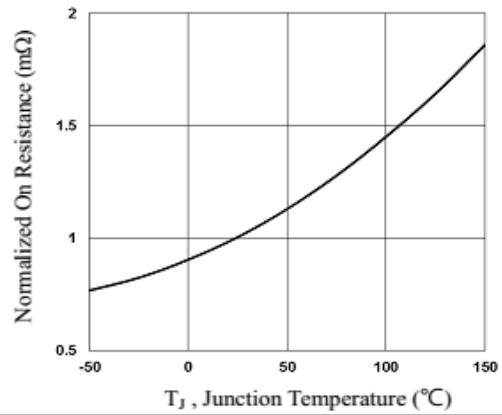


特征曲线 ELECTRICAL CHARACTERISTICS (curves)

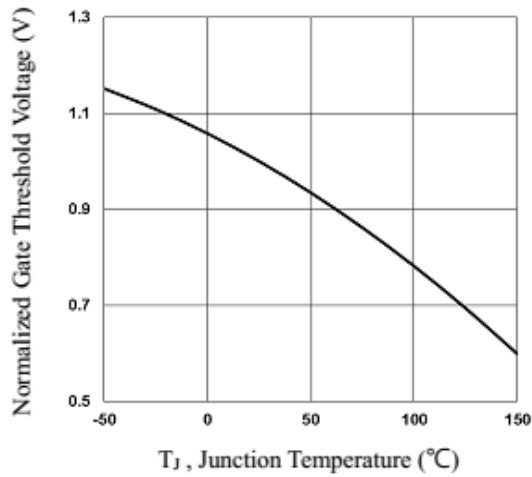
Continuous Drain Current vs. Temperature



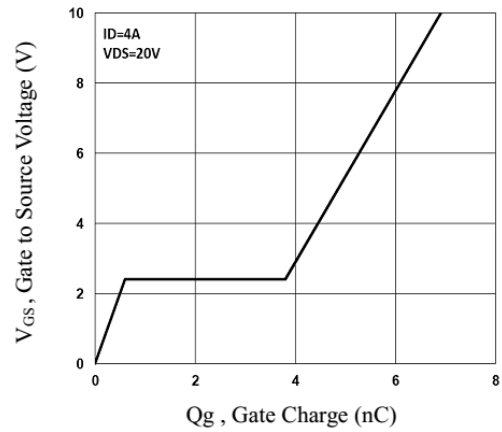
On-Resistance Variation vs. Temperature



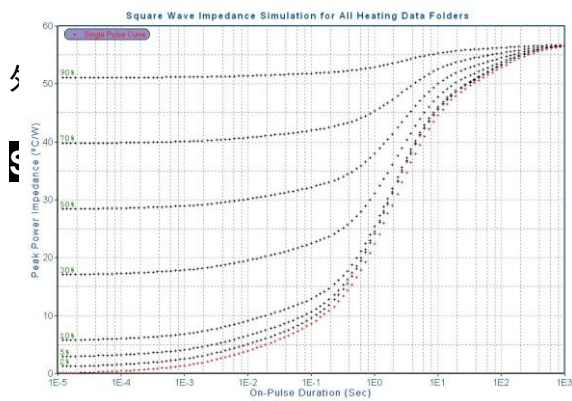
Gate Threshold Voltage vs. Temperature



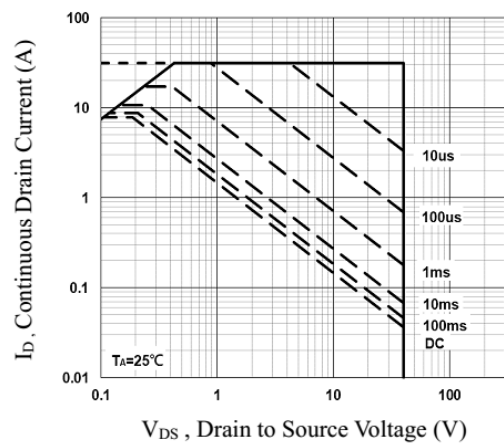
Gate Charge Characteristics

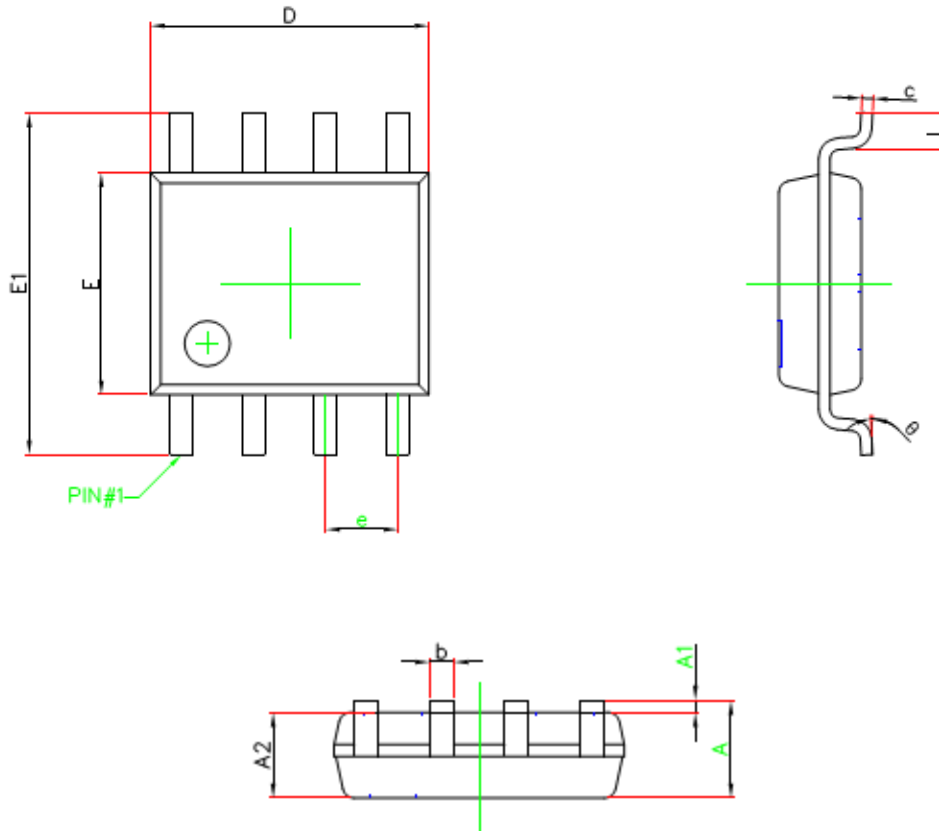


Transient Thermal Response Curve



Maximum Safe Operation





SYMBOL	MM	
	MIN	MAX
A	1.350	1.750
A1	0.100	0.250
A2	1.350	1.550
b	0.330	0.510
c	0.170	0.250
D	4.800	5.200
E	3.800	4.200
E1	5.800	6.200
e	1.27 (TYP)	
L	0.400	1.270
θ	0°	8°



**注意事项**

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