DESCRIPTION

The MX4N100 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

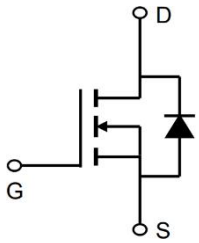
GENERAL FEATURES

- V_{DS}=100V, I_D=3.8A
  $R_{DS(ON)}$(Typ.)=240mΩ @ V_{GS}=4.5V
  $R_{DS(ON)}$(Typ.)=210mΩ @ V_{GS}=10V

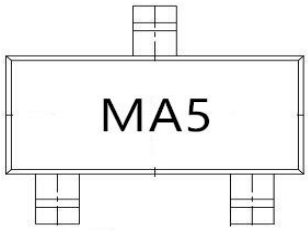
APPLICATION

- Battery protection
- Load switch
- Uninterruptible power supply

PINOUT



Schematic diagram



Marking and pin Assignment


SOT23-3 top view

ORDERING INFORMATION

Part Number	StorageTemperature	Package	Devices Per Reel
MX4N100	-55°C to 150°C	SOT23-3	3000

ABSOLUTE MAXIMUM RATINGS(T_C=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	3.8	A
Drain Current-Continuous(T_C=100°C)	I_D	2	A
Drain Current-Pulsed(Note1)	I_{DM}	8	A
Power Dissipation	P_D	3.76	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	70	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	30	°C/W

Note1. Repetitive Rating : Pulsed width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS(T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V, V_{GS}=0V	-	-	1	μA
		V_{DS}=80V,V_{GS}=0V,T_J=125°C	-	-	10	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.0	1.9	2.5	V
Drain-Source On-State Resistance(Note2)	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=0.5A	-	240	280	mΩ
		V_{GS}=10V, I_D=1A	-	210	240	mΩ
Forward Transconductance	g_{fs}	V_{DS}=10V, I_D=2A	-	2.3	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=25V, V_{GS}=0V, F=1.0MHz	-	152	200	pF
Output Capacitance	C_{oss}		-	17	20	pF
Reverse Transfer Capacitance	C_{rss}		-	10	15	pF
Gate Resistance	R_g	V_{DS}=0V,V_{GS}=0V,F=1.0MHz	-	2.8	5.6	Ω
Switching Characteristics(Note2)(Note3)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=50V, I_D=1A, V_{GS}=10V,R_G=3.3Ω	-	5.2	10	nS
Turn-on Rise Time	t_r		-	6.8	12	nS
Turn-Off Delay Time	$t_{d(off)}$		-	14.5	28	nS
Turn-Off Fall Time	t_f		-	2.1	5	nS
Total Gate Charge	Q_g	V_{DS}=50V, I_D=1A, V_{GS}=10V	-	9	18	nC
Gate-Source Charge	Q_{gs}		-	2.3	4.6	nC
Gate-Drain Charge	Q_{gd}		-	1.1	2.5	nC
Drain-Source Diode Characteristics						
Coninuous Source Current	I_S	V_G=V_D=0V, Force Current	-	-	4	A
Pulsed Source Current	I_{SM}		-	-	8	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=1A	-	-	1	V

Note2. Essentially independent of operating temperature.
Note3.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 3. Switching Time Circuit

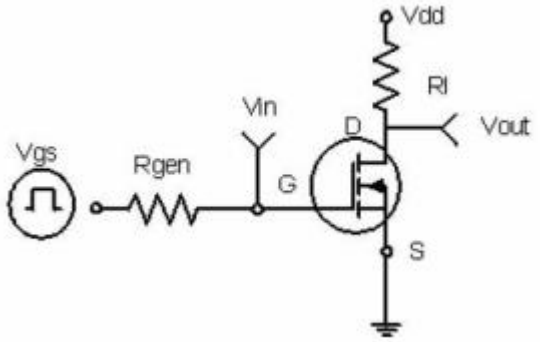


Figure 2. Switching Waveforms

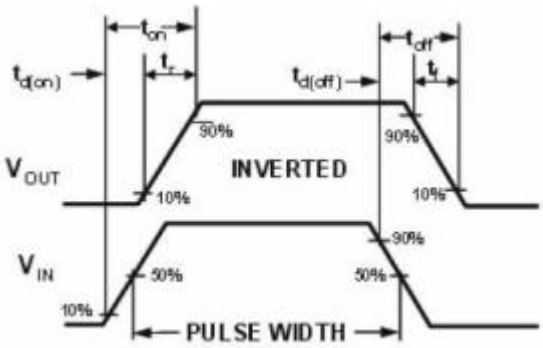


Figure 3. Output Characteristics

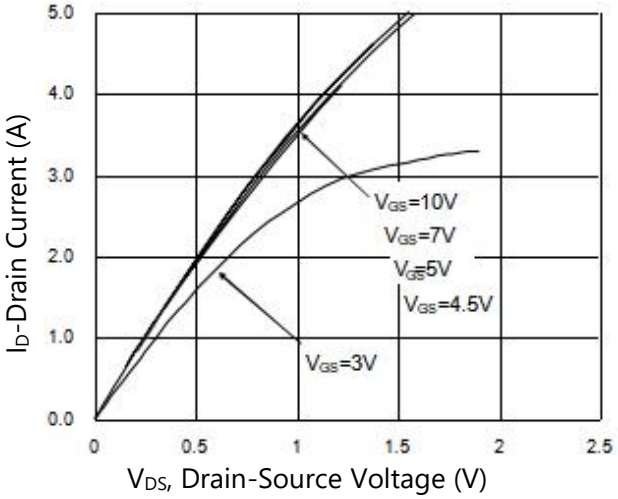


Figure 4. R_{DSON} vs Junction Temperature

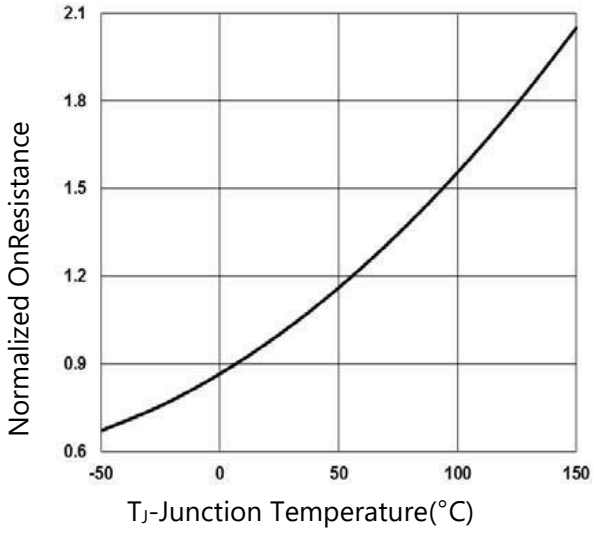


Figure 5. $V_{GS(th)}$ vs Junction Temperature

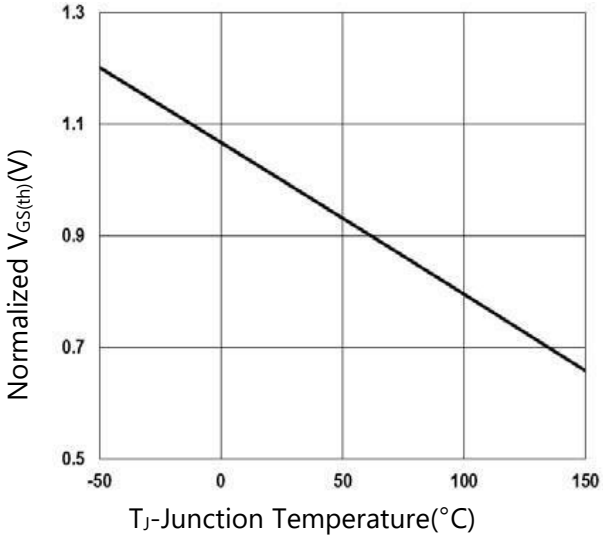
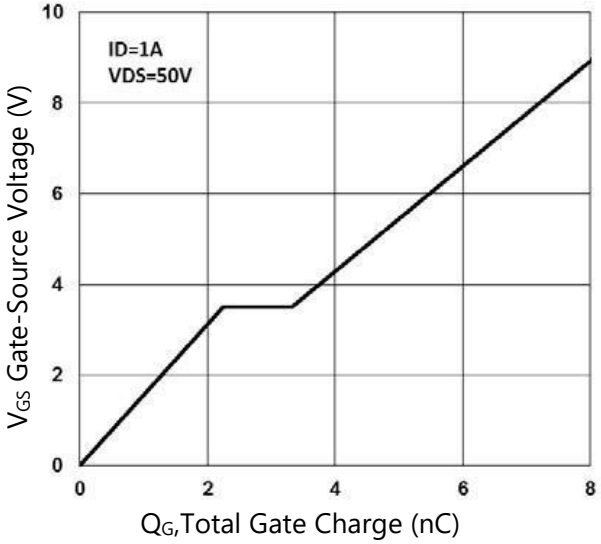


Figure 6. Gate Charge Characteristics



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7. Normalized Transient Impedance

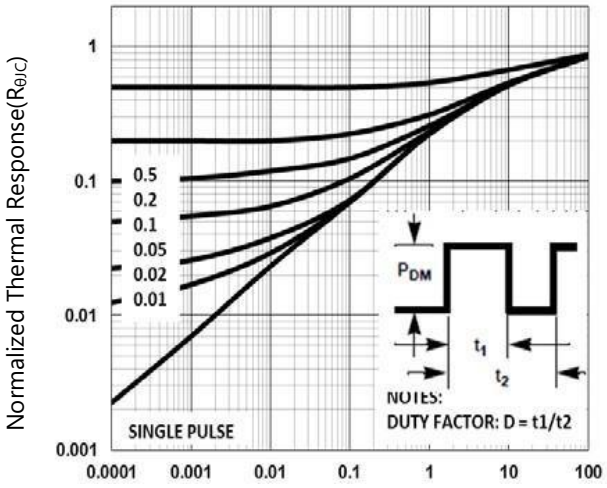
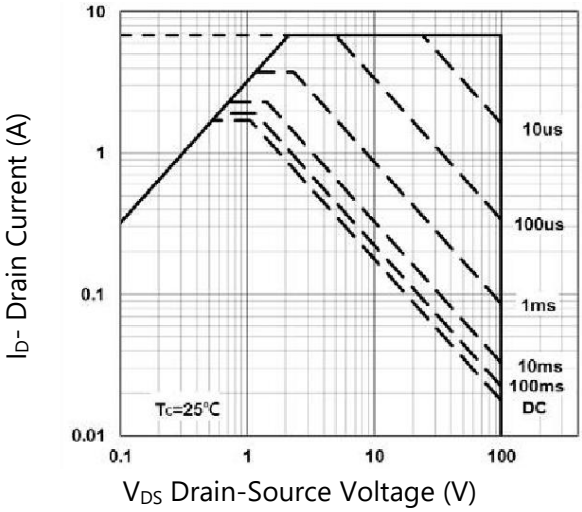
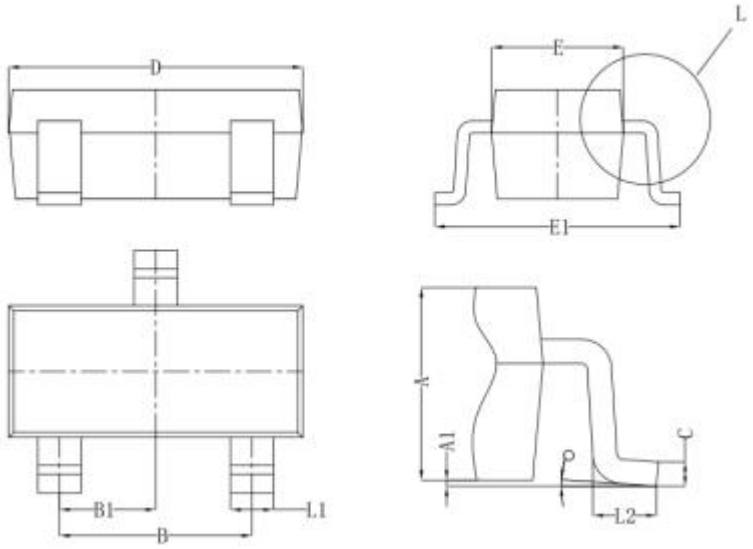


Figure 8. Safe Operation Area



PACKAGE INFORMATION

SOT23-3L



Symbol	Dimensions In Millimeters		
	Min.	Nor.	Max.
A	1.050	1.100	1.150
A1	0.000	0.050	0.100
L1	0.300	0.400	0.500
C	0.100	0.150	0.200
D	2.820	2.920	3.020
E	1.500	1.600	1.700
E1	2.650	2.800	2.950
B	1.800	1.900	2.000
B1	0.950 TYP.		
L2	0.300	0.450	0.600
O	0°	4°	8°