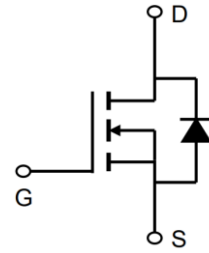


100V N-Channel Enhancement Mode MOSFET

Description

The 1N10 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

$V_{DS} = 100V$ $I_D = 1.5A$

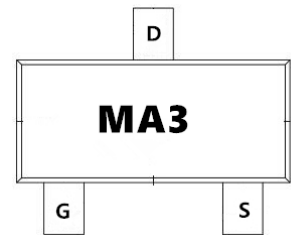
$R_{DS(ON)} < 500m\Omega$ @ $V_{GS} = 10V$

Application

Atomizer

Load switch

Uninterruptible power supply



Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

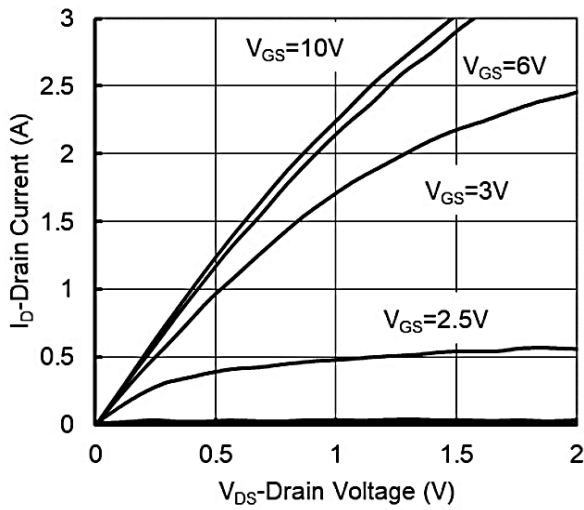
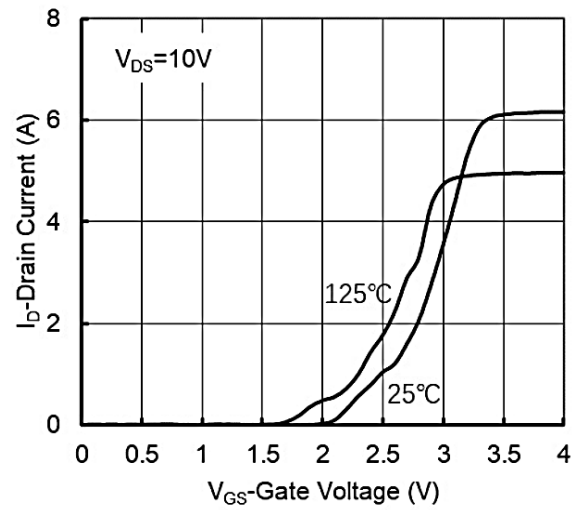
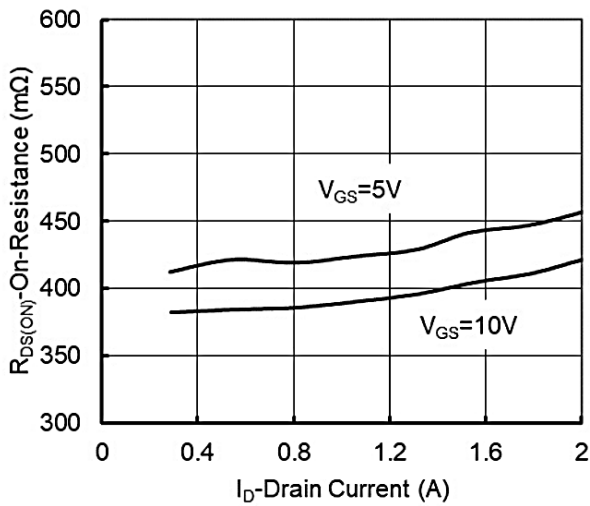
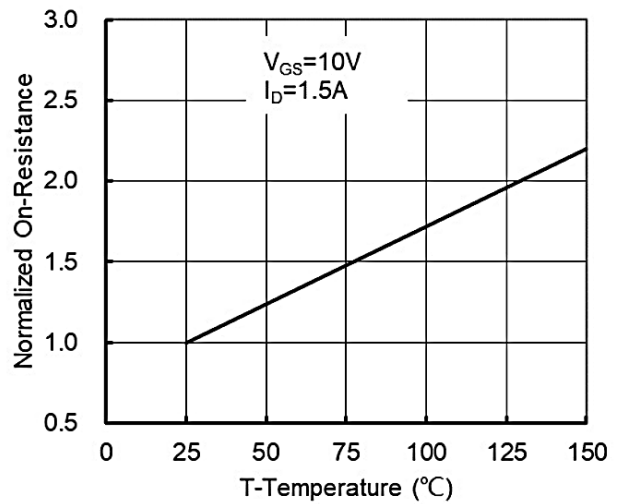
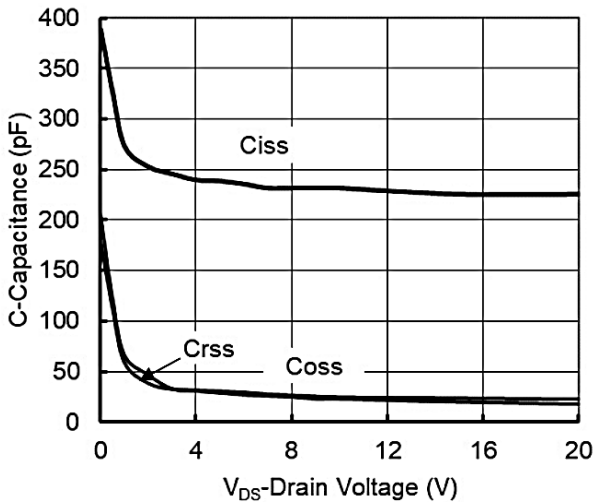
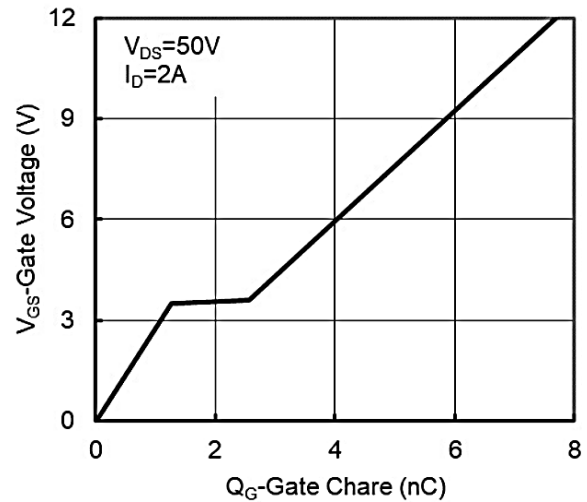
Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	1.5	A
$I_D @ T_A = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	1.2	A
I_{DM}	Pulsed Drain Current ²	6	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation ³	1.2	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	104	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	75	$^\circ C/W$

100V N-Channel Enhancement Mode MOSFET
Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100			V
$IDSS$	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V$			1	μA
$IGSS1$	Gate-Body Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
$IGSS2$		$V_{GS}=\pm 10V, V_{DS}=0V$			± 50	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	1.8	2.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=1.5A$		430	500	$m\Omega$
$R_{DS(ON)}$		$V_{GS}=4.5V, I_D=1A$		460	550	
C_{iss}	Input Capacitance	$V_{DS}=10V, V_{GS}=0V, f=1MHz$		232		pF
C_{oss}	Output Capacitance			23		pF
C_{rss}	Reverse Transfer Capacitance			24		pF
Q_g	Total Gate Charge	$V_{GS}=10V, V_{DS}=50V, I_D=2A$		6.47		nC
Q_{gs}	Gate-Source Charge			1.27		nC
Q_{gd}	Gate-Drain Charge			1.29		nC
Q_{rr}	Reverse Recovery Charge	$I_F=2A, di/dt=100A/us$		18.1		nC
t_{rr}	Reverse Recovery Time			36.9		ns
$tD(on)$	Turn-on Delay Time	$V_{GS}=10V, V_{DS}=50V, I_D=1.3A, R_{GEN}=1\Omega$		4.6		ns
t_r	Turn-on Rise Time			18		ns
$tD(off)$	Turn-off Delay Time			16		ns
t_f	Turn-off fall Time			27.4		ns
V_{SD}	Diode Forward Voltage	$I_S=1.5A, V_{GS}=0V$			1.2	V

Note :

- 1、The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3、The power dissipation is limited by 150 $^{\circ}\text{C}$ junction temperature
- 4、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

Figure1. Output Characteristics

Figure2. Transfer Characteristics

Figure 3: On-Resistance vs. Drain Current

Figure 4: On-Resistance vs. Junction Temperature

Figure5. Capacitance Characteristics

Figure6. Gate Charge

100V N-Channel Enhancement Mode MOSFET

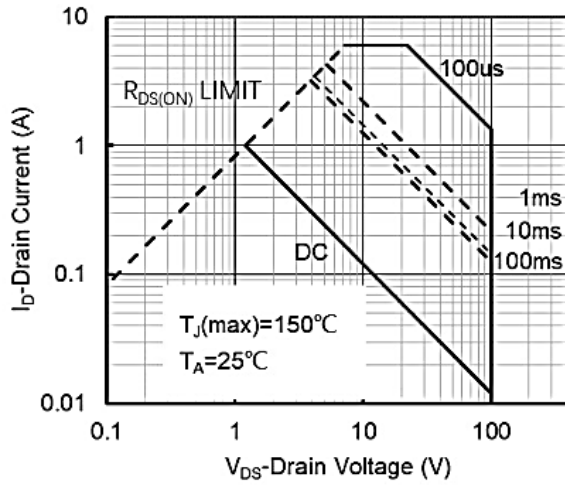


Figure7. Safe Operation Area

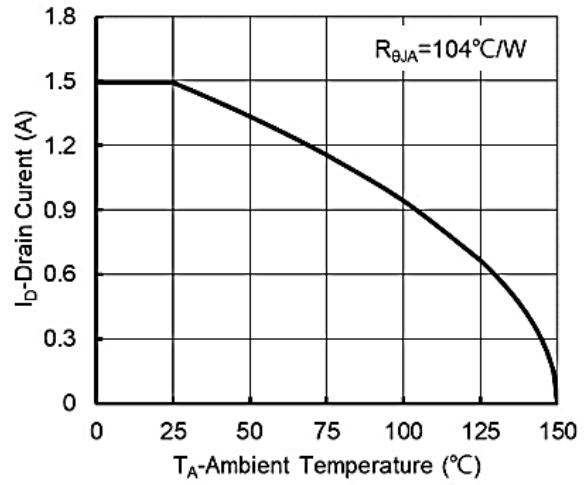


Figure8. Maximum Continuous Drain Current vs Ambient Temperature

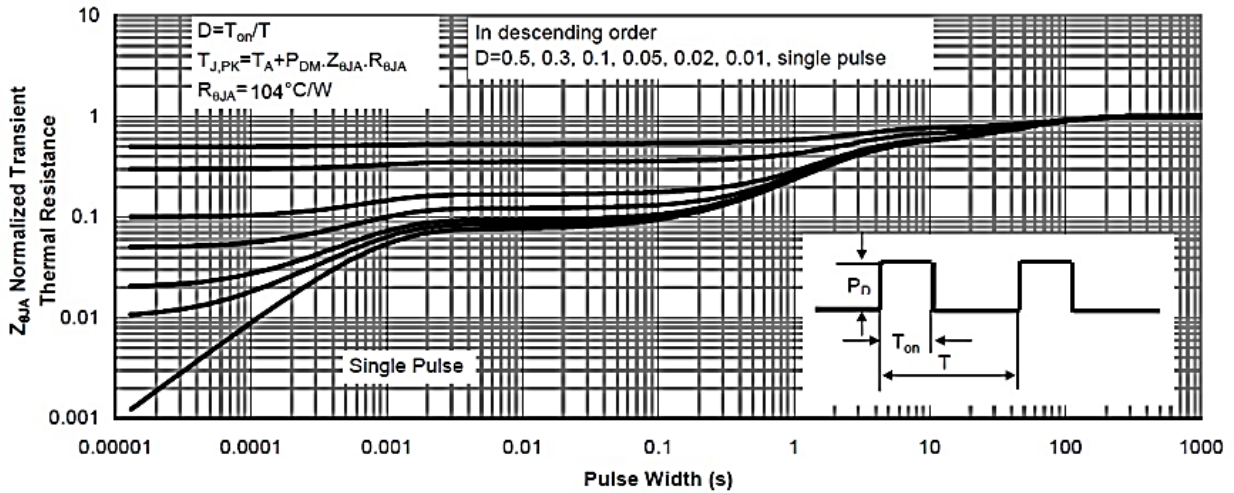
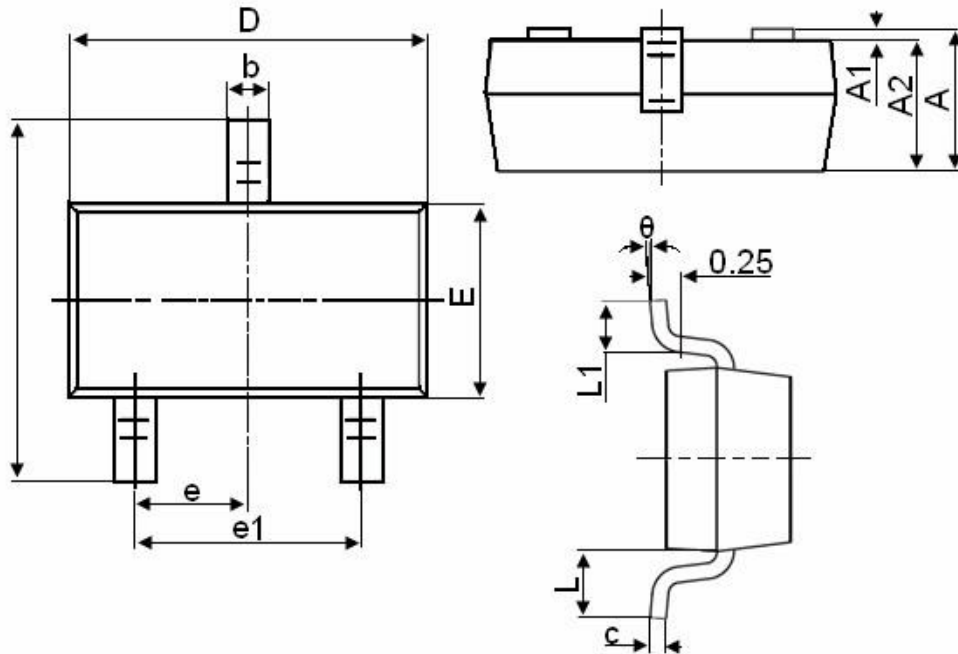


Figure9. Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-SOT23-XC-Single


Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°