

100V N-Channel Enhancement Mode MOSFET

Description

The AP8N10MSI 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

$V_{DS} = 100V$ $I_D = 8A$

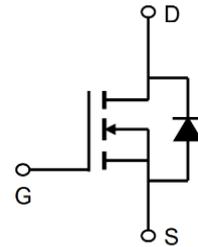
$R_{DS(ON)} < 110m\Omega @ V_{GS}=10V$ (Type: 88m Ω)

Application

Automotive lighting

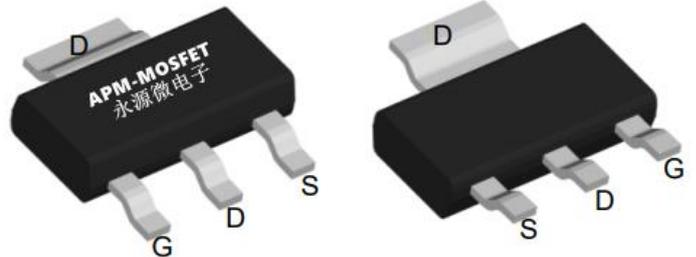
Load switch

Uninterruptible power supply



Top View

Bottom View



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
AP8N10MSI	SOT223-3L	AP8N10MSI XXX YYYY	3000

Absolute Maximum Ratings (TC=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C=25^\circ C$	Drain Current, $V_{GS} @ 10V$	8	A
$I_D @ T_C=100^\circ C$	Drain Current, $V_{GS} @ 10V$	6.5	A
IDM	Pulsed Drain Current ¹	24	A
$P_D @ T_C=25^\circ C$	Total Power Dissipation	30	W
$P_D @ T_A=25^\circ C$	Total Power Dissipation ³	2.7	W
TSTG	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C
$R_{\theta JA}$	Maximum Thermal Resistance, Junction-ambient	100	°C/W
$R_{\theta JC}$	Maximum Thermal Resistance, Junction-case	5.1	°C/W

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Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Type	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	100	107	-	V
IDSS	Zero Gate Voltage Drain Current	V _{DS} =100V, V _{GS} =0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.5	V
RDS(on)	Static Drain-Source on-Resistance	V _{GS} =10V, I _D =5A	-	88	110	mΩ
		V _{GS} =4.5V, I _D =3A	-	96	140	mΩ
Ciss	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	765	-	pF
Coss	Output Capacitance		-	38	-	pF
Crss	Reverse Transfer Capacitance		-	33	-	pF
Q _g	Total Gate Charge	V _{DS} =30V, I _D =5A, V _{GS} =10V	-	12	-	nC
Q _{gs}	Gate-Source Charge		-	2.2	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	2.5	-	nC
td(on)	Turn-on Delay Time	V _{DS} =30V, I _D =10A, R _G =1.8Ω, V _{GS} =10V	-	7	-	ns
t _r	Turn-on Rise Time		-	5	-	ns
td(off)	Turn-off Delay Time		-	16	-	ns
t _f	Turn-off Fall Time		-	6	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	10	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	40	A
VSD	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =10A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I _F =10A, dI/dt=100A/μs	-	21	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	21	-	nC

Note :

- 1、 The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2、 The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3、 The power dissipation is limited by 150°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.

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Typical Characteristics

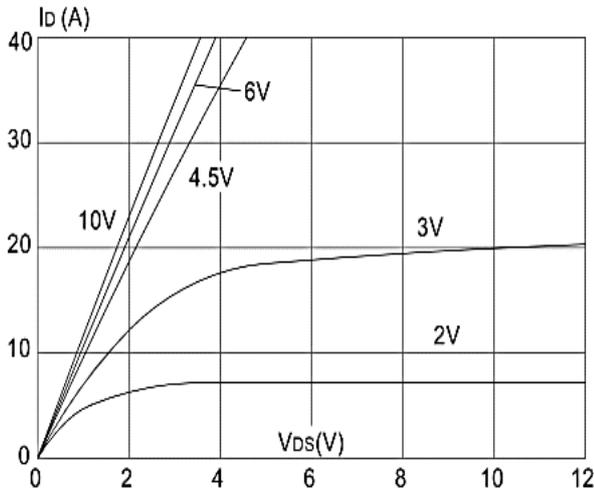


Figure 1: Output Characteristics

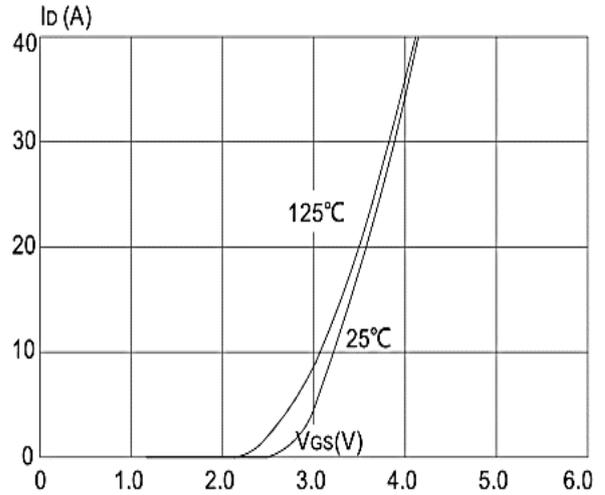


Figure 2: Typical Transfer Characteristics

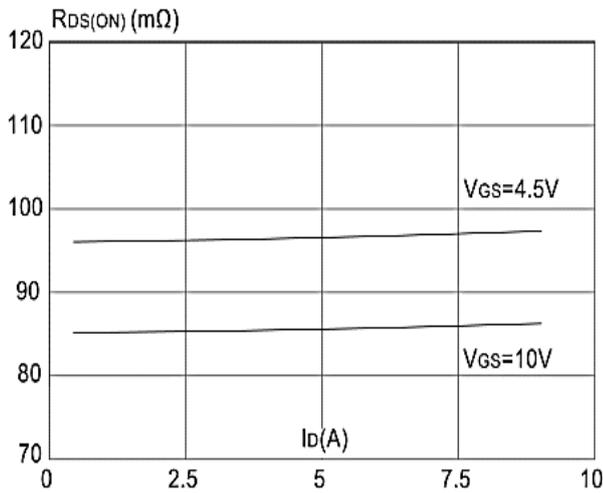


Figure 3: On-resistance vs. Drain Current

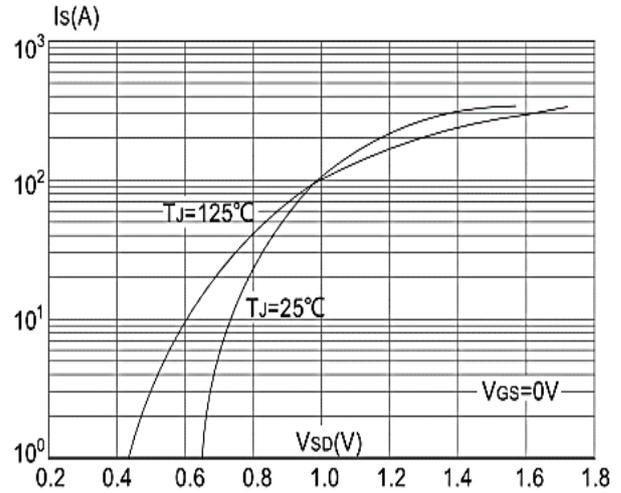


Figure 4: Body Diode Characteristics

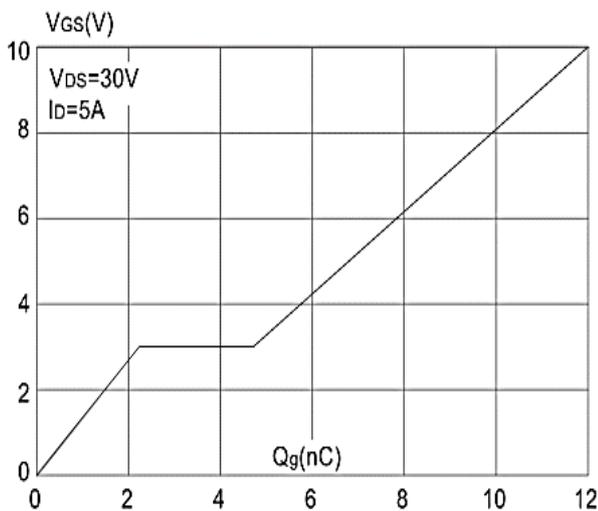


Figure 5: Gate Charge Characteristics

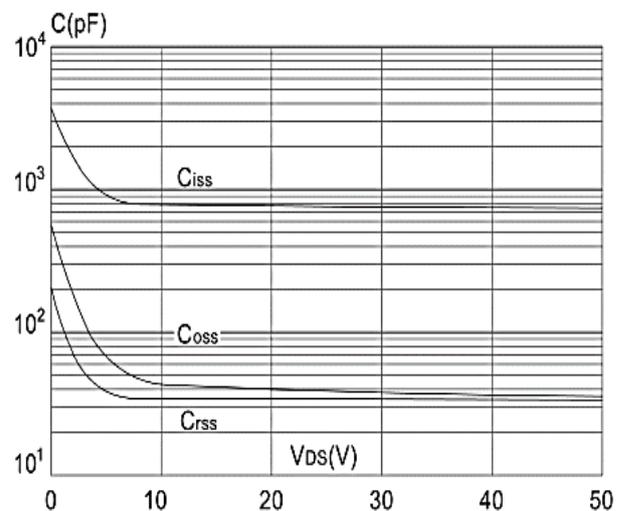


Figure 6: Capacitance Characteristics

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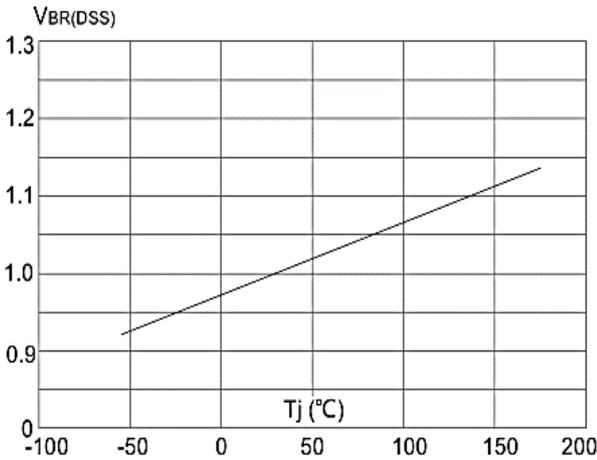


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

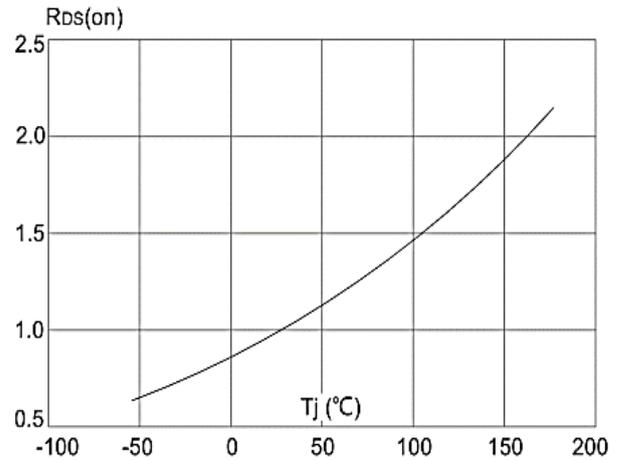


Figure 8: Normalized on Resistance vs. Junction Temperature

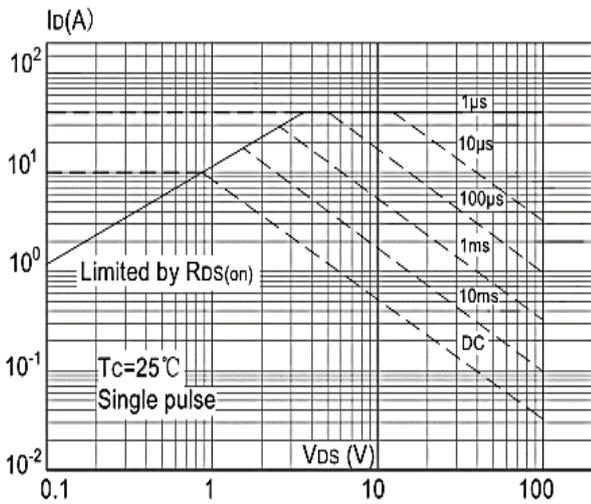


Figure 9: Maximum Safe Operating Area

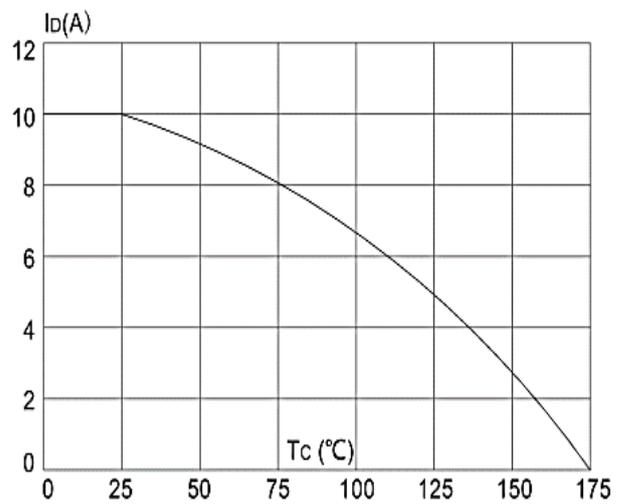


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

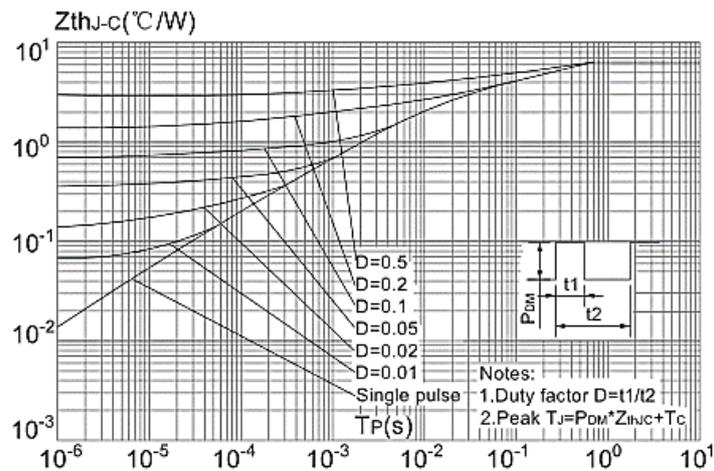
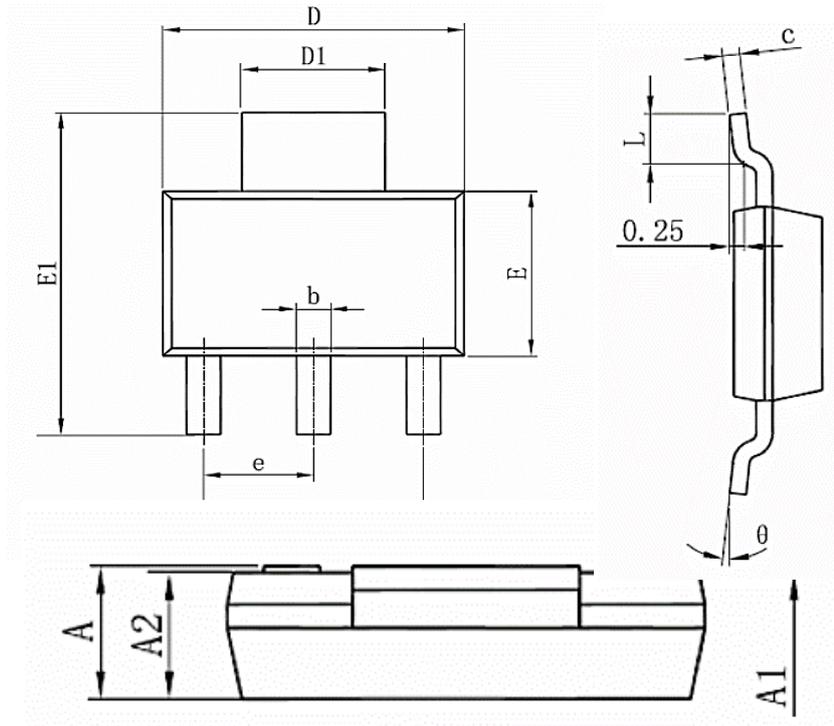


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

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Package Mechanical Data:SOT223-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.52	1.8	0.06	0.049
A1	0.000	0.100	0.000	0.004
A2	1.5	1.7	0.059	0.045
b	0.66	0.82	0.026	0.032
c	0.25	0.35	0.010	0.014
D	6.2	6.4	0.244	0.252
D1	2.9	3.1	0.114	0.122
E	3.3	3.7	0.130	0.146
E1	6.83	7.07	0.269	0.278
e	2.300(BSC)		0.037(BSC)	
e1	4.500	4.700	0.177	0.185
L	0.900	1.15	0.035	0.045
θ	0°	10°	0°	10°

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Edition	Date	Change
Rve1.0	2020/1/31	Initial release

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