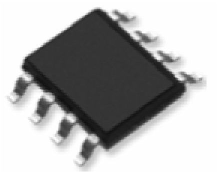
LM8S12N03

30V N-Channel Enhancement Mode MOSFET

Description

The LM8S12N03 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.

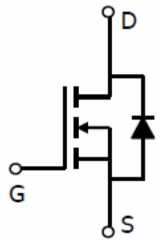
Dimensions SOP-8



General Features

- V_{DS} = 30V I_D =12A
  $R_{DS(ON)}$ < 12mΩ @ V_{GS}=10V

Pin Configuration



Application

- Battery protection
- Load switch
- Uninterruptible power supply

Package Marking and Ordering Information

Device	Device Marking	Device Package	Reel Size	Tape width	Quantity
LM8S12N03	AP4406A	SOP-8	Ø330mm	12mm	3000 units

Absolute Maximum Ratings (TC=25℃ unless otherwise noted)

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	30	V
V_{GSS}	Gate-Source Voltage	±20	V
I_D@T_A=25°C	Continuous Drain Current, V_{GS} @ 10V[1]	12	A
I_D@T_A=70°C	Continuous Drain Current, V_{GS} @ 10V[1]	8	A
I_{DM}	Pulsed Drain Current [note1]	48	A
E_{AS}	Single Pulsed Avalanche Energy [note2]	16	mJ
P_D@T_A=25°C	Total Power Dissipation[4]	3	W
$R_{θJA}$	Thermal Resistance, Junction to Ambient	46	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	℃

Electrical Characteristics (TJ=25℃, unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V(BR)DSS	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	30	33	-	V
IDSS	Zero Gate Voltage Drain Current	V_{DS}=30V, 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	1.2	1.6	2.5	V
RDS(on)	Static Drain-Source on-Resistance note3	V_{GS}=10V, I_D=13A	-	8.5	12	mΩ
RDS(on)	Static Drain-Source on-Resistance note3	V_{GS}=4.5V, I_D=10A	-	13	18	
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1.0MHz	-	900	-	pF
Coss	Output Capacitance		-	140	-	pF
Crss	Reverse Transfer Capacitance		-	120	-	pF
Q_g	Total Gate Charge	V_{DS}=15V, I_D=10A, V_{GS}=10V	-	19	-	nC
Q_{gs}	Gate-Source Charge		-	6.3	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	4.5	-	nC
td(on)	Turn-on Delay Time	V_{DS}=15V, I_D=6A, R_{GEN}=3Ω, V_{GS}=10V	-	6	-	ns
t_r	Turn-on Rise Time		-	5	-	ns
td(off)	Turn-off Delay Time		-	25	-	ns
t_f	Turn-off Fall Time		-	7	-	ns
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	12	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	48	A
VSD	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=12A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=10A,dI/dt=100A/μs	-	7	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	6.3	-	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℃ 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 Electrical and Thermal Characteristics

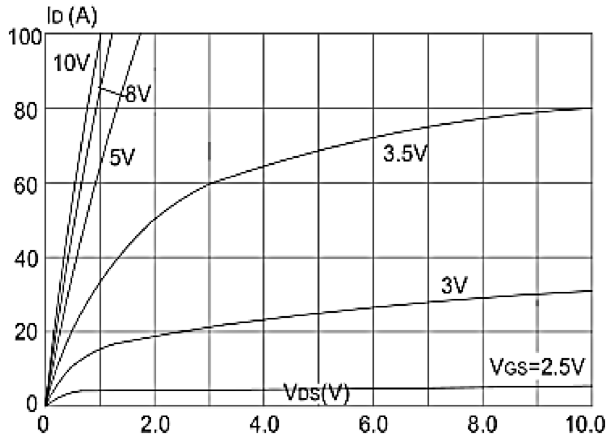


Figure1: Output Characteristics

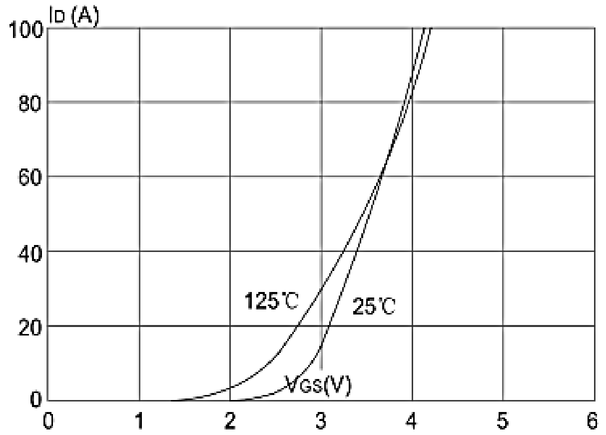


Figure 2: Typical Transfer Characteristics

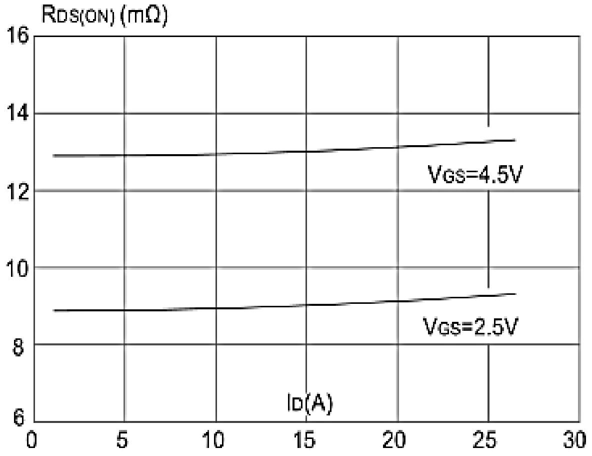


Figure 3:On-resistance vs. Drain Current

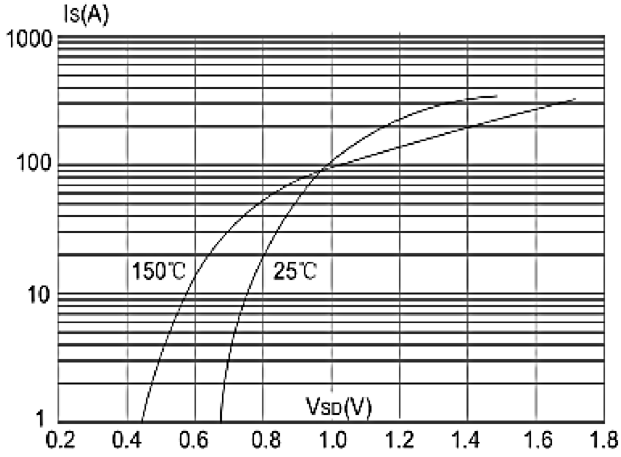


Figure 4: Body Diode Characteristics

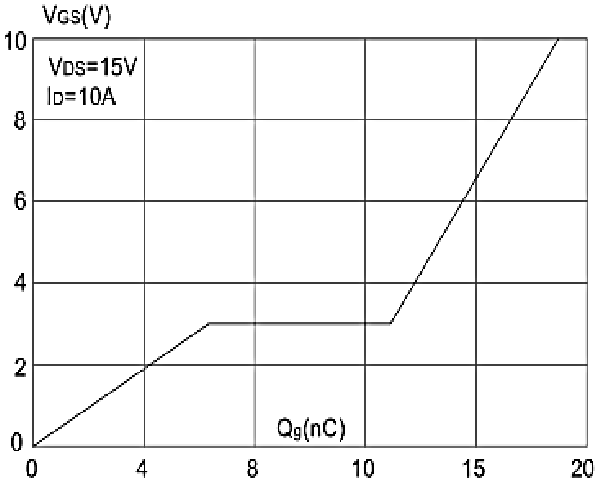


Figure 5: Gate Charge Characteristics

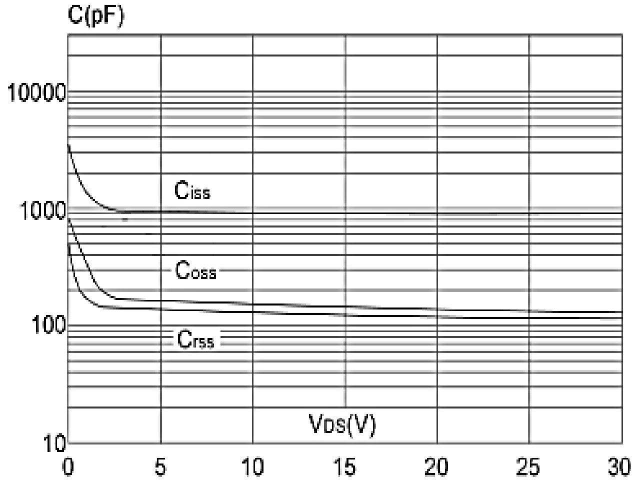


Figure 6: Capacitance Characteristics

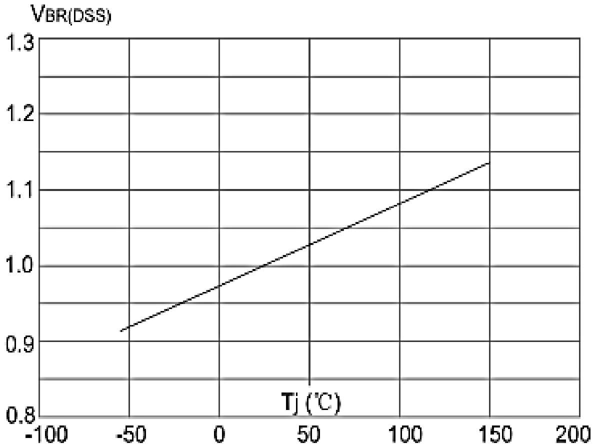


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

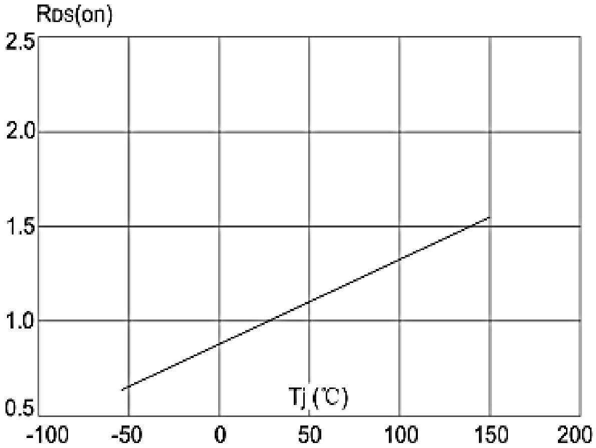


Figure 8: Normalized on Resistance vs. Junction Temperature

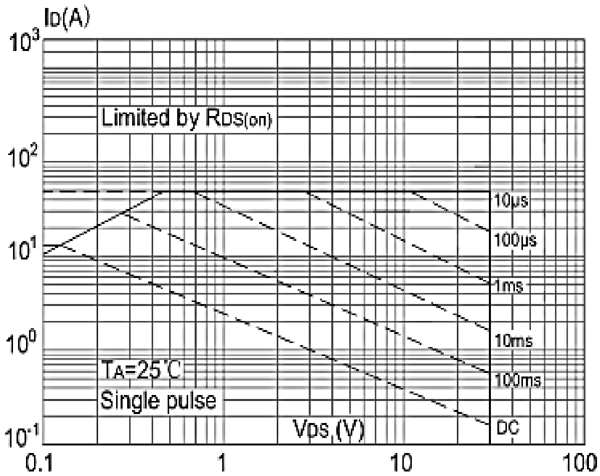


Figure 9: Maximum Safe Operating Area

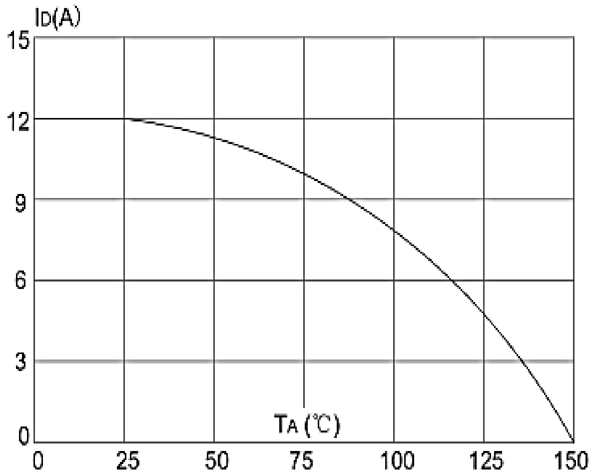


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

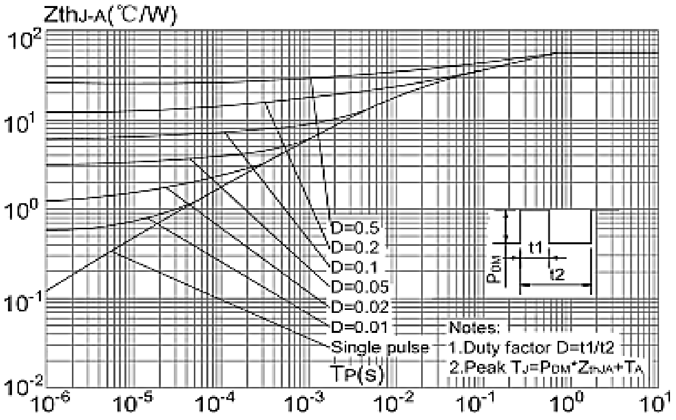
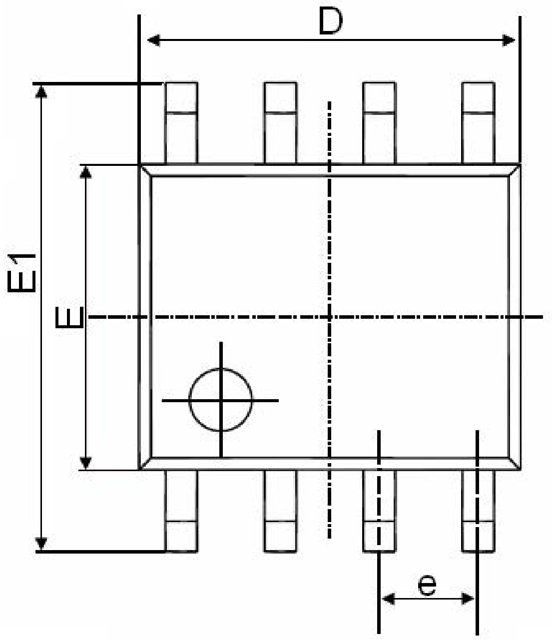
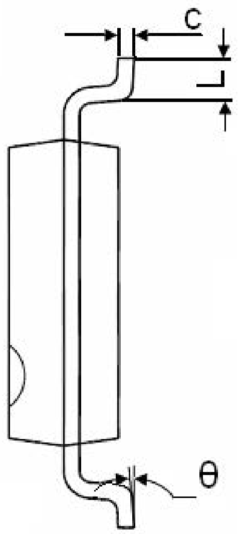
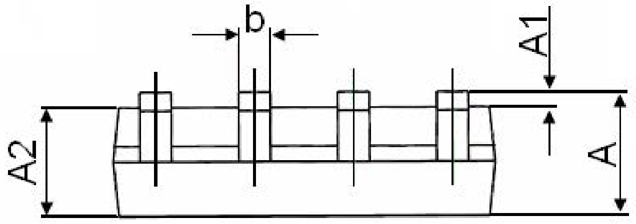


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

SOP-8 Package Information







Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

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