

- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

### Product Summary

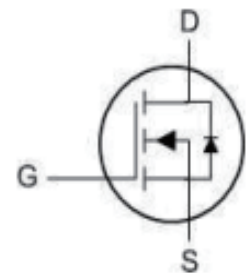
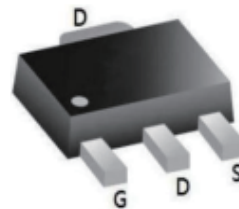
RoHS

BVDSS	RDSON	ID
100V	110mΩ	6.5A

### Description

The S8N10 is the high cell density trenched N-ch MOSFETs, which provides excellent RDSON and efficiency for most of the small power switching and load switch applications. The S8N10 meets the RoHS and Green Product requirement with full function reliability approved.

### SOT89-3L Pin Configuration



### Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
$V_{DS}$	Drain-Source Voltage	100	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	6.5	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	3.2	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	12	A
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation <sup>3</sup>	2	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Electrical Characteristics ( $T_J = 25^\circ\text{C}$  unless otherwise specified)

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	100	110	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 100V, V_{GS} = 0V$	-	-	1	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	$\pm 100$	nA
<b>On Characteristics</b> <small>note3</small>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.95	3	V
$R_{DS(on)}$	Static Drain-Source On-Resistance <small>note2</small>	$V_{GS} = 10V, I_D = 3A$	-	115	140	m $\Omega$
<b>Dynamic Characteristics</b> <small>note4</small>						
$C_{iss}$	Input Capacitance	$V_{DS} = 50V, V_{GS} = 0V, f = 1.0MHz$	-	206	-	pF
$C_{oss}$	Output Capacitance		-	28.9	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	1.4	-	pF
$Q_g$	Total Gate Charge	$V_{DS} = 50V, I_D = 3A, V_{GS} = 10V$	-	4.3	-	nC
$Q_{gs}$	Gate-Source Charge		-	1.5	-	nC
$Q_{gd}$	Gate-Drain ("Miller") Charge		-	1.1	-	nC
<b>Switching Characteristics</b> <small>note4</small>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 50V, I_{DS} = 3A, R_G = 2\Omega, V_{GEN} = 10V$	-	14.7	-	ns
$t_r$	Turn-On Rise Time		-	3.5	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	20.9	-	ns
$t_f$	Turn-Off Fall Time		-	2.7	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current <small>note2</small>		-	-	6.5	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	12	A
$V_{SD}$	Drain to Source Diode Forward Voltage <small>note3</small>	$V_{GS} = 0V, I_S = 3A$	-	-	1.3	V
$t_{rr}$	Body Diode Reverse Recovery Time	$V_{GS} = 0V, I_F = 3A, di/dt = 100A/\mu s$	-	32.1	-	ns
$Q_{rr}$	Body Diode Reverse Recovery Time Charge		-	39.4	-	nC
$I_{rrm}$	Peak Reverse Recovery Current		-	2.1	-	A

## Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production
5.  $V_{DD} = 50V, R_G = 50\Omega, L = 0.3mH$ , starting  $T_J = 25^\circ\text{C}$

Typical Electrical and Thermal Characteristics (Curves)

Figure 1: Output Characteristics

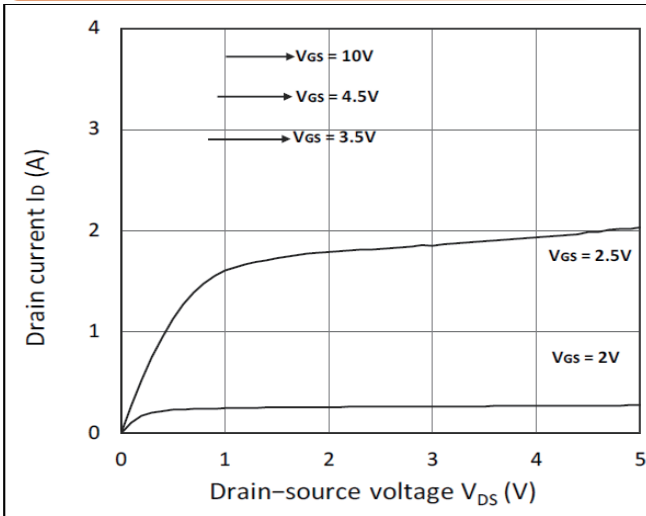


Figure 2: Typical Transfer Characteristics

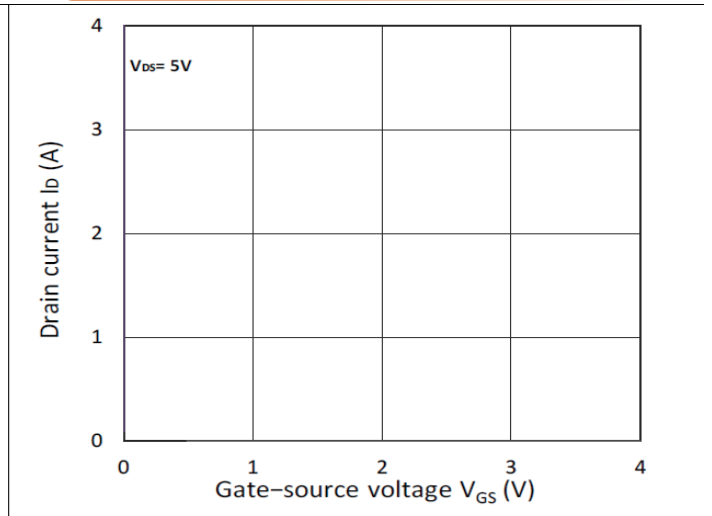


Figure 3: Forward Characteristics of Reverse

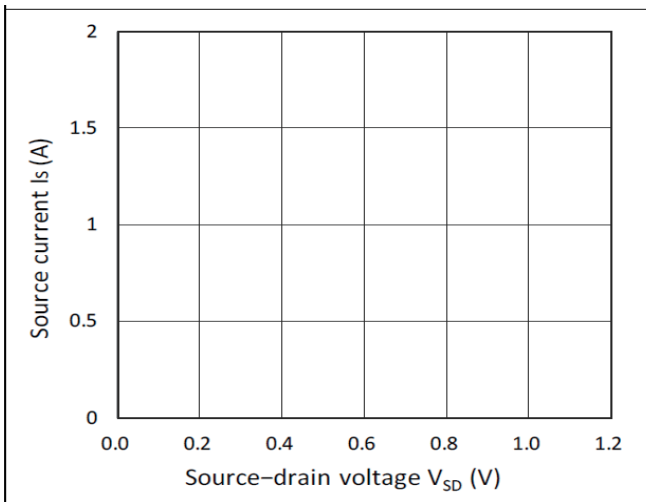


Figure 4: RDS(ON) vs. VGS

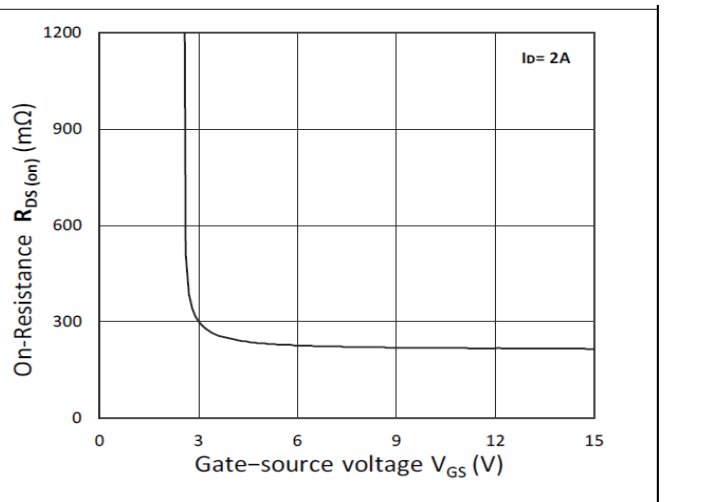


Figure 5: RDS(ON) vs. ID

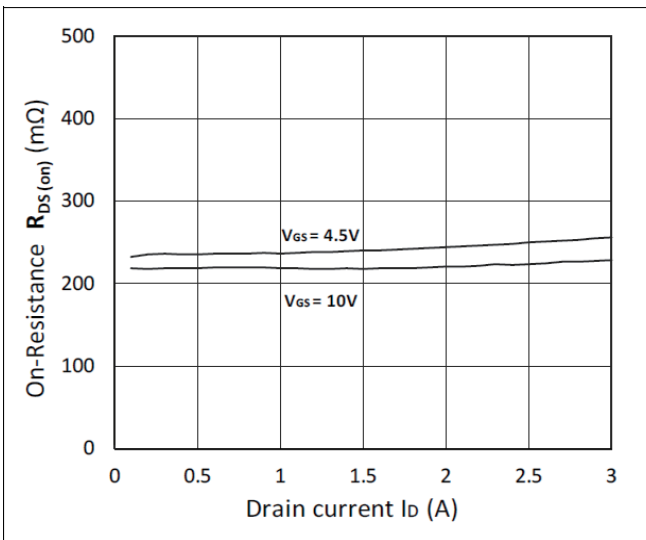
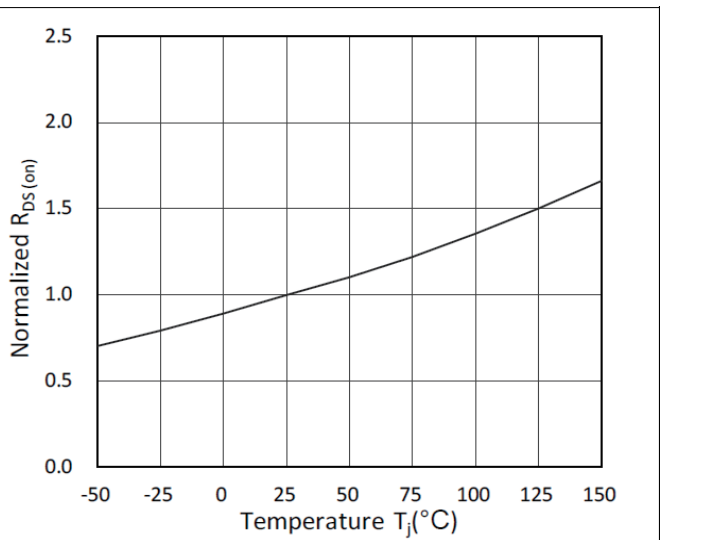


Figure 6: Normalized RDS(on) vs. Temperature



Typical Performance Characteristics

Figure 7: Capacitance Characteristics

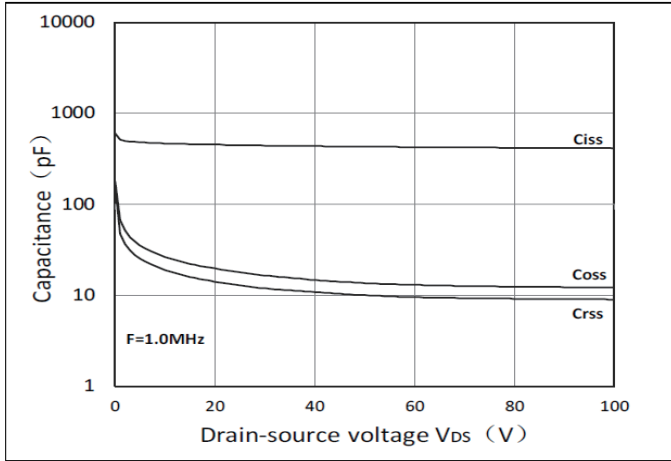
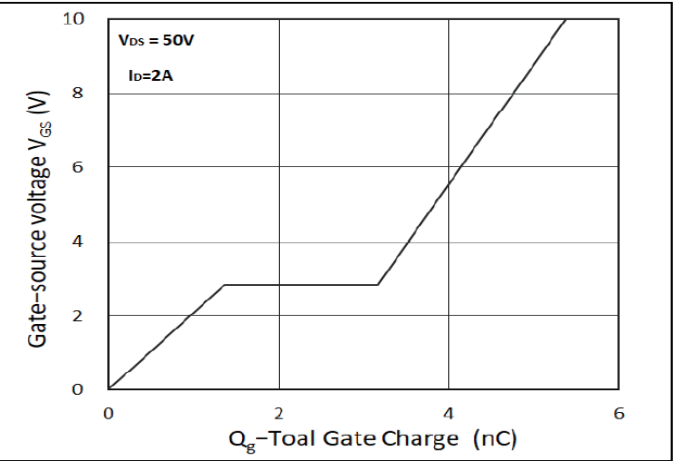
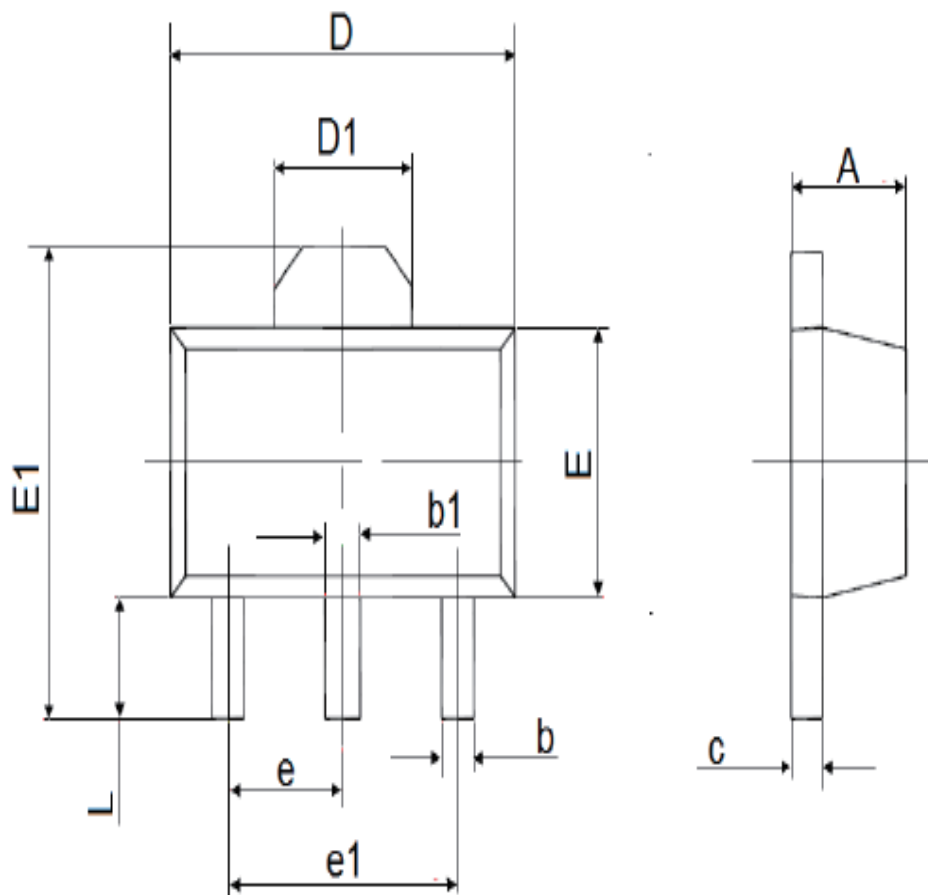


Figure 8: Gate Charge Characteristics



SOT-89-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

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