

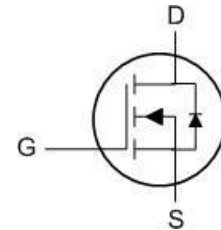
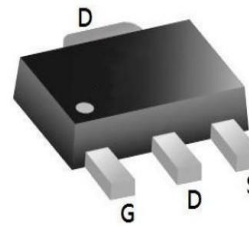
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology


**Product Summary**

BVDSS	R <sub>DS(on)</sub>	I <sub>D</sub>
40V	19mΩ	8A

**Description**

The XXW8N04Q is the high cell density trenched P-ch MOSFETs, which provides excellent R<sub>DS(on)</sub> and efficiency for most of the small power switching and load switch applications. The XXW8N04Q meet the RoHS and Green Product requirement with full function reliability approved.

**SOT89-3L Pin Configuration**

**Absolute Maximum Ratings** (T<sub>A</sub>=25°C unless otherwise specified)

Symbol	Parameter	Max.	Units
V <sub>DSS</sub>	Drain-Source Voltage	40	V
V <sub>GSS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub>	Continuous Drain Current	T <sub>A</sub> = 25°C	8.0
		T <sub>A</sub> = 100°C	4
I <sub>DM</sub>	Pulsed Drain Current <sup>note1</sup>	32.8	A
EAS	Single Pulsed Avalanche Energy <sup>note2</sup>	13	mJ
P <sub>D</sub>	Power Dissipation	T <sub>A</sub> = 25°C	2.0
R <sub>θJA</sub>	Thermal Resistance, Junction to Ambient	73	°C/W
T <sub>J</sub> , T <sub>STG</sub>	Operating and Storage Temperature Range	-55 to +150	°C

**N-Channel 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	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=40V, V_{GS}=0V$	-	-	1.0	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note3</small>	$V_{GS}=10V, I_D=8A$	-	19	24	m $\Omega$
		$V_{GS}=4.5V, I_D=5A$	-	25	35	m $\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=20V, V_{GS}=0V,$ $f=1.0MHz$	-	633	-	pF
$C_{oss}$	Output Capacitance		-	67	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	58	-	pF
$Q_g$	Total Gate Charge	$V_{DS}=20V, I_D=8A,$ $V_{GS}=10V$	-	12	-	nC
$Q_{gs}$	Gate-Source Charge		-	3.2	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge		-	3.1	-	nC
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=20V, R_L=2.5\Omega$ $V_{GS}=10V, R_{REN}=3\Omega$	-	4	-	ns
$t_r$	Turn-on Rise Time		-	3	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	15	-	ns
$t_f$	Turn-off Fall Time		-	2	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	8	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	32	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=8A$	-	-	1.2	V

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

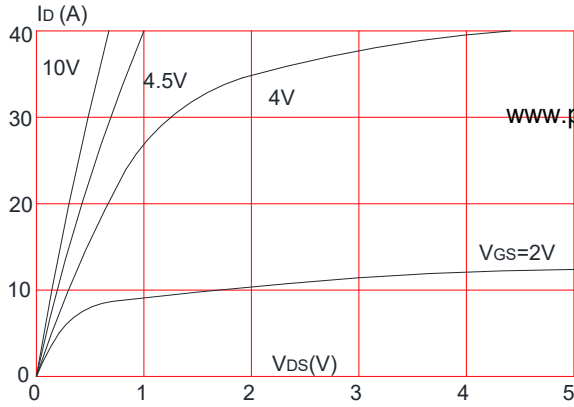
2. EAS condition :  $T_J=25^\circ\text{C}, V_{DD}=20V, V_G=10V, L=0.5mH, R_g=25\Omega, I_{AS}=7.2A$

$T_J=25^\circ\text{C}, V_{DD}=-20V, V_G=-10V, L=0.5mH, R_g=25\Omega, I_{AS}=-8.4A$

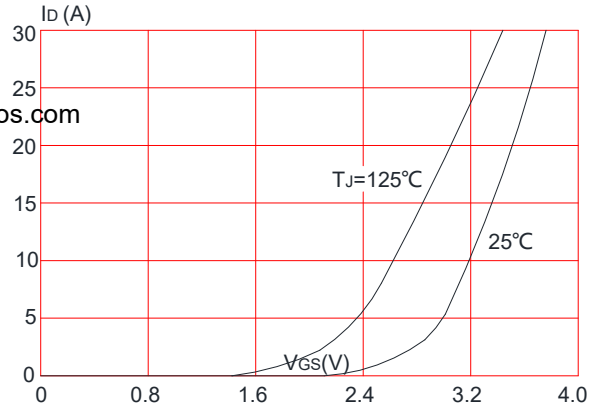
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$

### Typical Performance Characteristics-N

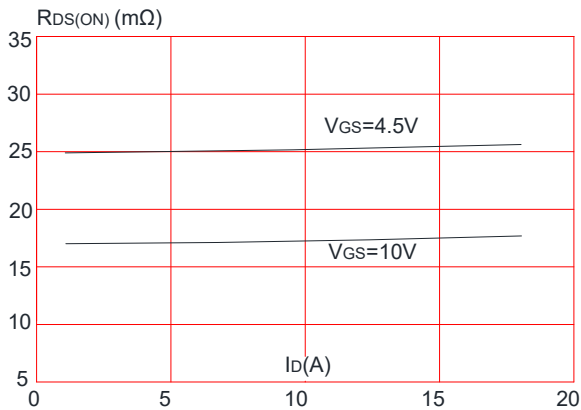
**Figure 1: Output Characteristics**



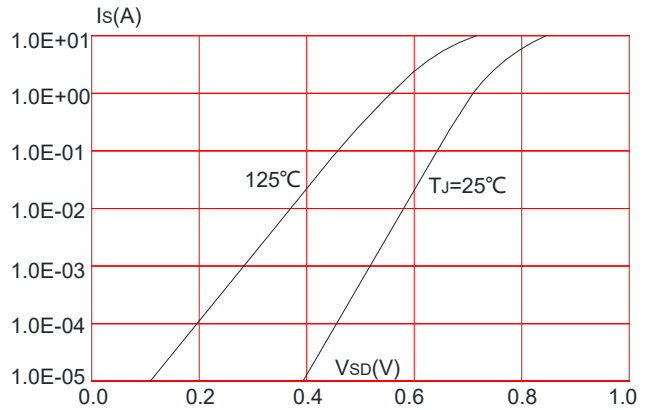
**Figure 2: Typical Transfer Characteristics**



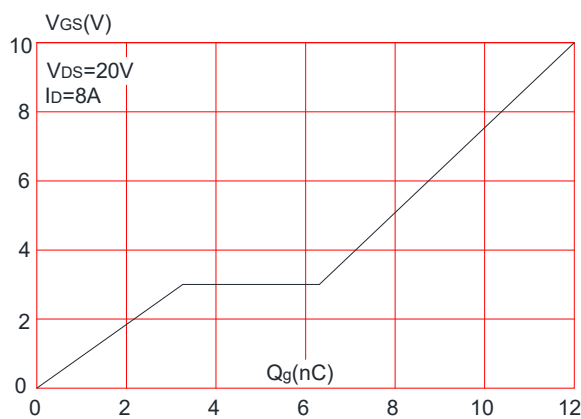
**Figure 3: On-resistance vs. Drain Current**



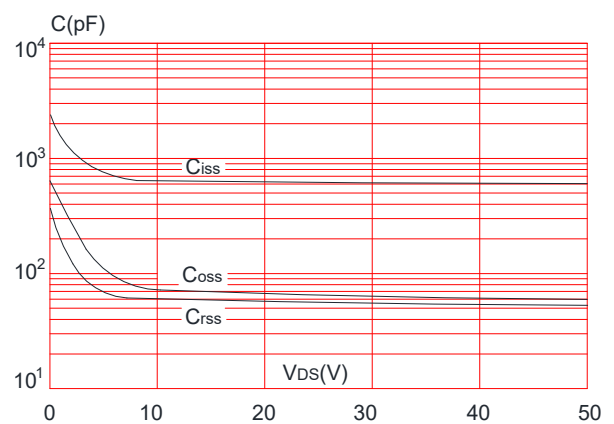
**Figure 4: Body Diode Characteristics**

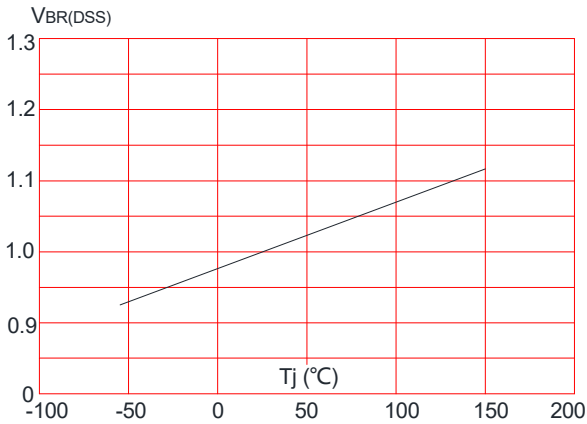
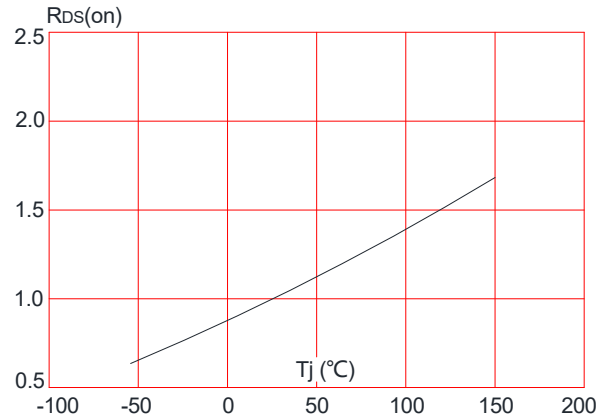
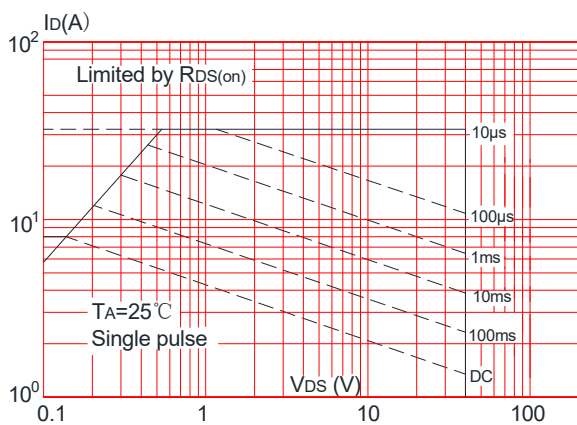
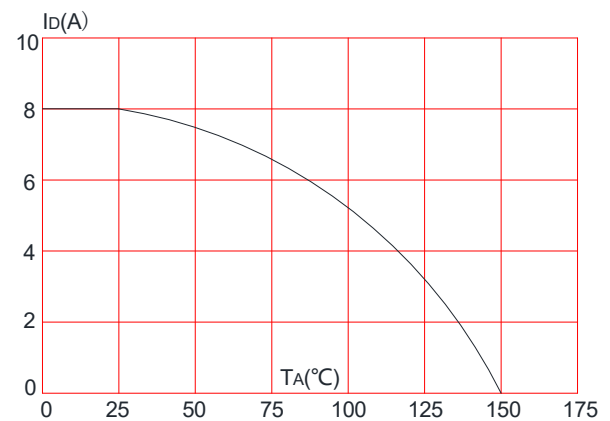
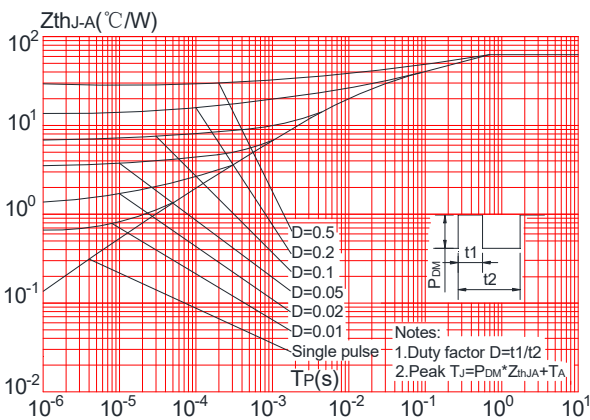


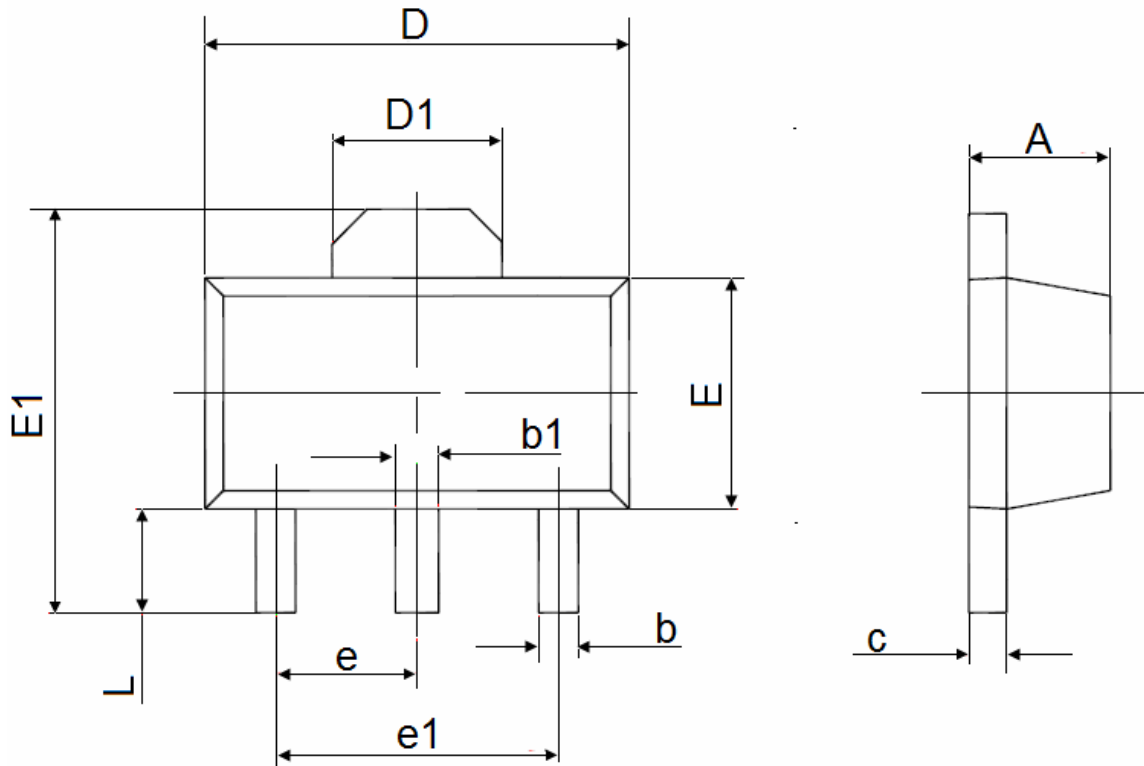
**Figure 5: Gate Charge Characteristics**



**Figure 6: Capacitance Characteristics**



**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-Ambient**


**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