

# N-Channel Enhancement Mode Power MOSFET

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
100V	178m $\Omega$ @10V	3A
	190m $\Omega$ @4.5V	

## Features

- Fast Switching
- Low Reverse Transfer Capacitance
- Low Gate Charge and RDS(on)
- $V_{DS} = 100V, I_D = 3A$
- $R_{DS(on)} < 178m\Omega @ V_{GS} = 10V$
- AEC-Q101 qualified (Automotive grade with suffix "Q".)
- Exsemi technology

## Applications

- Load Switch
- PWM Applications

## Marking Code: 03N10

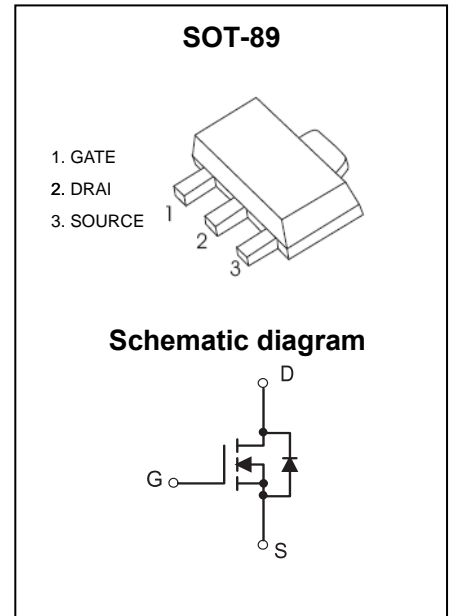
## Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	3	A
Drain Current-Pulsed <sup>Note1</sup>	$I_{DM}$	20	A
Maximum Power Dissipation	$P_D$	1.35	W
Junction Temperature	$T_J$	150	°C
Storage Temperature Range	$T_{STG}$	-55 to +150	°C

## Thermal Characteristics

Thermal Resistance, Junction-to-Ambient <sup>Note2</sup>	$R_{\theta JA}$	93	°C/W
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## Electrical Characteristics

(Ta=25°C unless otherwise specified)

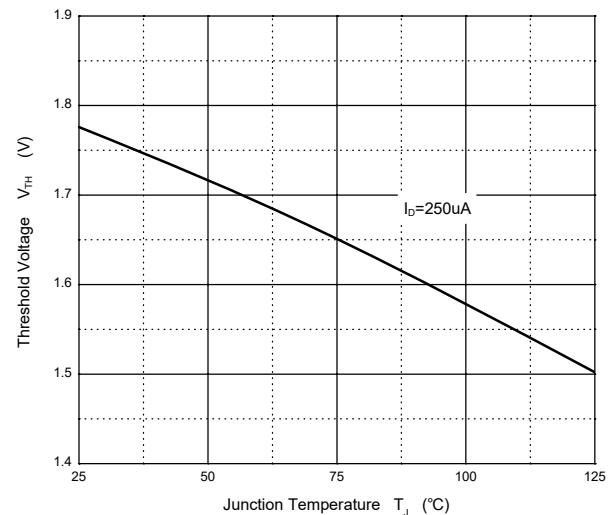
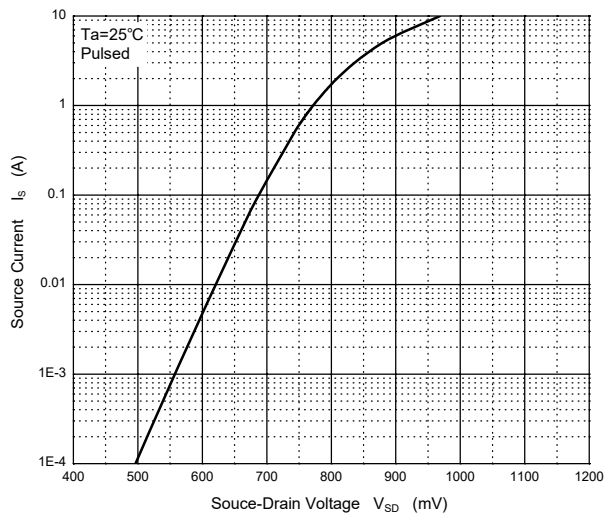
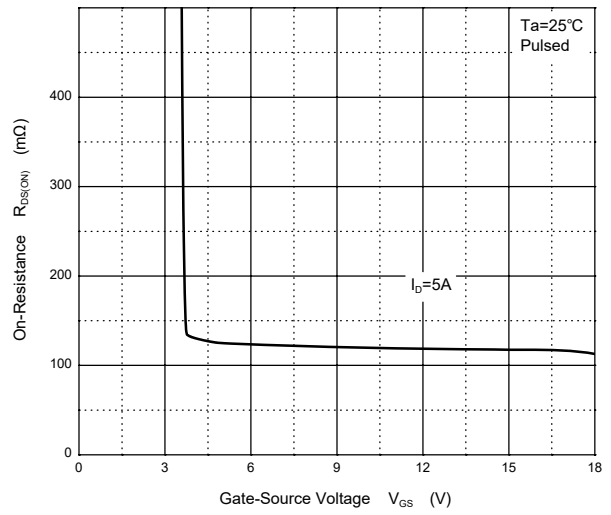
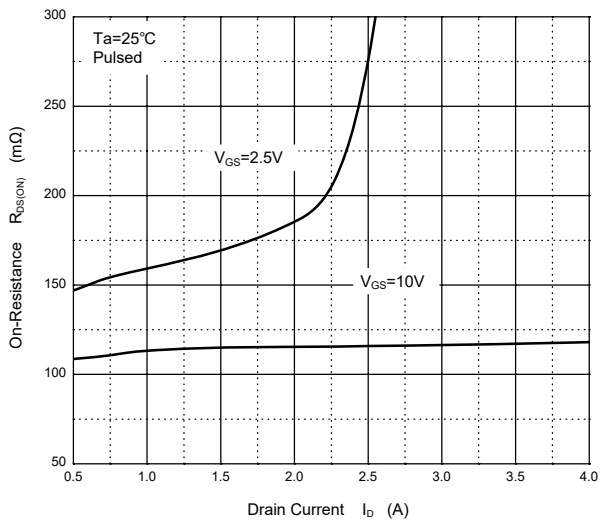
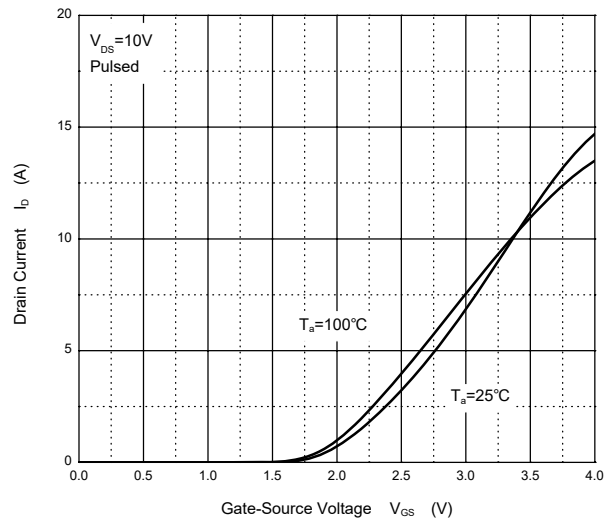
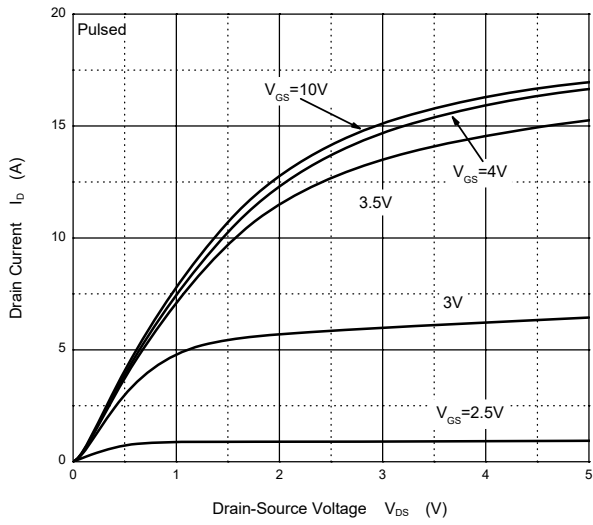
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=100V, V_{GS}=0V$	--	--	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	$\pm 100$	nA
Gate Threshold Voltage <sup>Note3</sup>	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	--	2	V
Drain-Source On-Resistance <sup>Note3</sup>	$R_{DS(on)}$	$V_{GS}=10V, I_D=3A$	--	--	178	m $\Omega$
		$V_{GS}=4.5V, I_D=3A$	--	--	190	m $\Omega$
Forward Transconductance <sup>Note3</sup>	$g_{FS}$	$V_{DS}=5V, I_D=2.9A$	3	--	--	S
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V, f=1MHz$	--	690	--	pF
Output Capacitance	$C_{oss}$		--	120	--	pF
Reverse Transfer Capacitance	$C_{rss}$		--	90	--	pF
<b>Switching Characteristics</b>						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=30V, R_L=15\Omega,$ $V_{GS}=10V, R_{GEN}=2.5\Omega$	--	11	--	nS
Turn-on Rise Time	$t_r$		--	7.4	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	35	--	nS
Turn-off Fall Time	$t_f$		--	9.1	--	nS
Total Gate Charge	$Q_g$	$V_{DS}=15V, I_D=4A, V_{GS}=10V$	--	15.5	--	nC
Gate-Source Charge	$Q_{gs}$		--	3.2	--	nC
Gate-Drain Charge	$Q_{gd}$		--	4.7	--	nC
<b>Source-Drain Diode Characteristics</b>						
Diode Forward Voltage <sup>Note3</sup>	$V_{SD}$	$V_{GS}=0V, I_S=3A$	--	--	1.5	V
Diode Forward Current <sup>Note2</sup>	$I_S$		--	--	3	A

Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

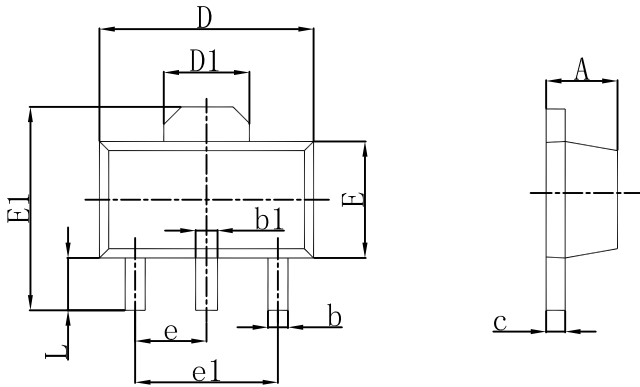
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.

3. Pulse Test: Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

Typical Characteristic Curves

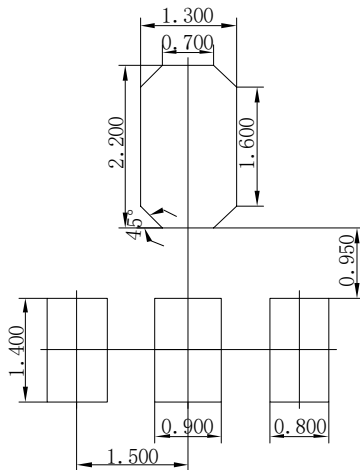


## SOT-89-3L Package Outline Dimensions



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

## SOT-89-3L Suggested Pad Layout



## Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05$ mm.
3. The pad layout is for reference purposes only.

## Ordering Information

Device	Package	Shipping
EP03N10Q	SOT-89	3,000PCS/Reel&13inches