

N-Channel Enhancement Mode MOSFET

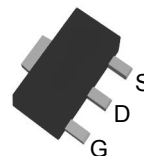
Features

- 100V/15A,
 $R_{DS(ON)} = 100m\Omega(max.) @ V_{GS} = 10V$
 $R_{DS(ON)} = 110m\Omega(max.) @ V_{GS} = 4.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

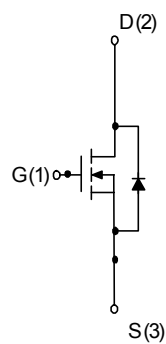
Applications

- Power Management in DC/DC Converter.
- Load Switching.

Pin Description



Top View SOT-89



N-Channel MOSFET

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit	
Common Ratings				
V_{DSS}	Drain-Source Voltage	100	V	
V_{GSS}	Gate-Source Voltage	± 20		
T_J	Maximum Junction Temperature	150	$^\circ\text{C}$	
T_{STG}	Storage Temperature Range	-55 to 150		
I_S	Diode Continuous Forward Current	$T_A=25^\circ$	3	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	15	A
		$T_C=70^\circ\text{C}$	13	
I_{DM}^a	Pulsed Drain Current	$T_C=25^\circ\text{C}$	26	A
P_D	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	3.5	W
		$T_A=70^\circ\text{C}$	2.2	
$R_{\theta JA}^c$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$	35	$^\circ\text{C/W}$
		Steady State	70	$^\circ\text{C/W}$
I_{AS}^b	Avalanche Current, Single pulse (L=0.5mH)		7	A
E_{AS}^b	Avalanche Energy, Single pulse (L=0.5mH)		12	mJ

Note a : Pulse width limited by max. junction temperature.

Note b : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature $T_J=25^\circ\text{C}$).

Note c : Surface Mounted on 1in^2 pad area.

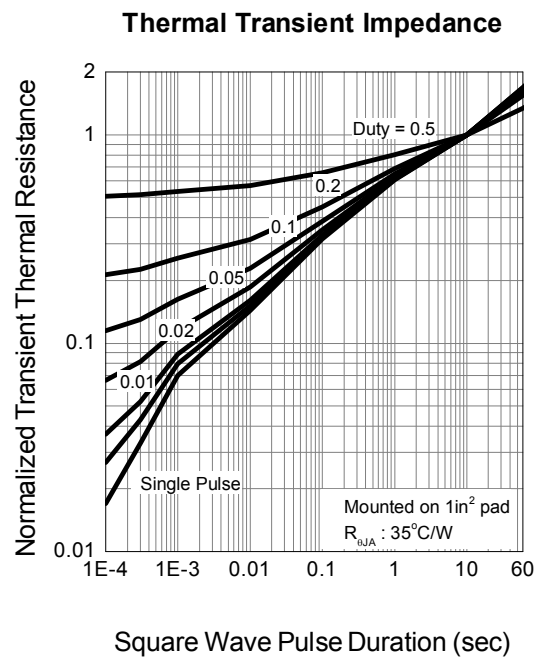
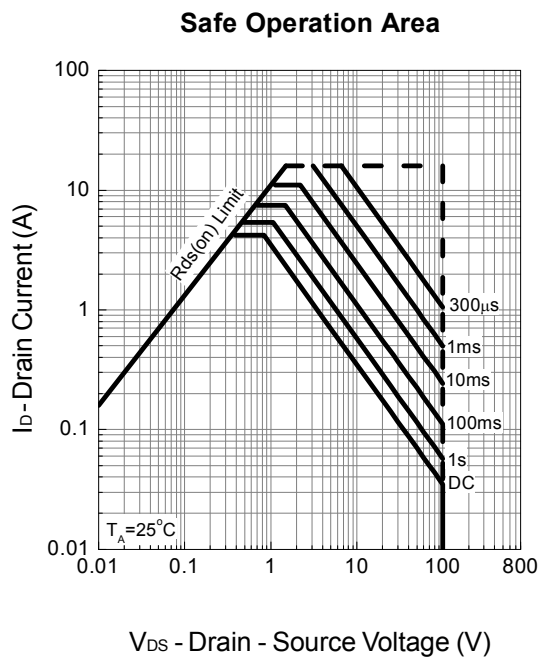
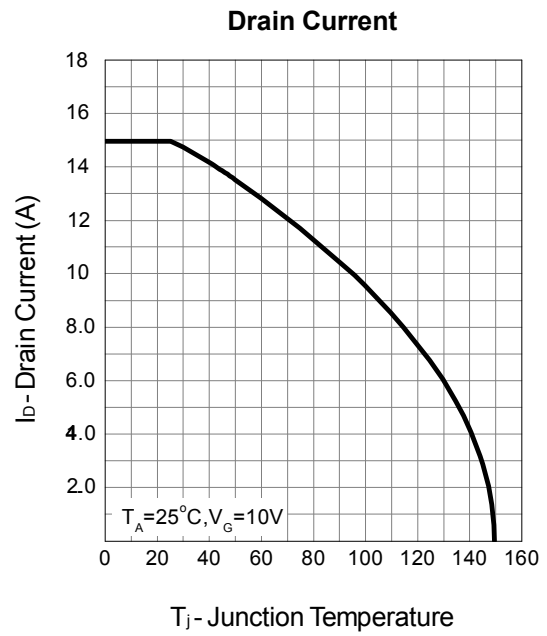
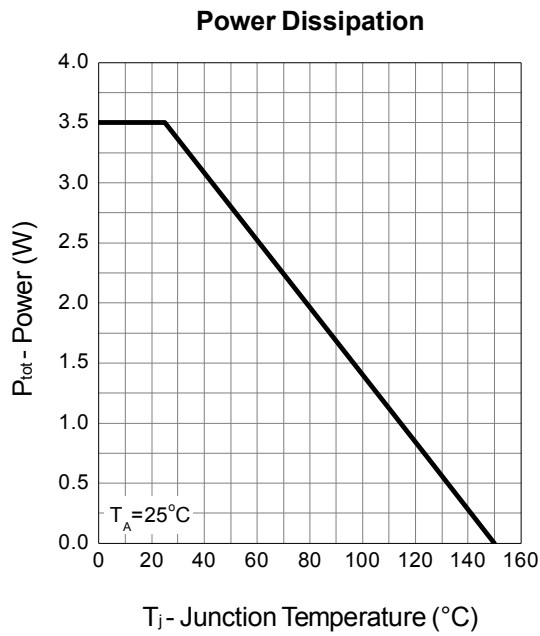
Electrical Characteristics ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=80V, V_{GS}=0V$ $T_J=85^\circ\text{C}$	-	-	1	μA
			-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1	2	3	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
$R_{DS(ON)}^d$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=4A$	-	80	100	$m\Omega$
		$V_{GS}=4.5V, I_{DS}=3.5A$	-	85	110	$m\Omega$
Diode Characteristics						
V_{SD}^d	Diode Forward Voltage	$I_{SD}=3A, V_{GS}=0V$	-	0.8	1.3	V
t_{rr}	Reverse Recovery Time	$I_{SD}=3A, dI_{SD}/dt=100A/\mu s$	-	27	-	ns
Q_{rr}	Reverse Recovery Charge		-	36	-	nC
Dynamic Characteristics ^e						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, f=1\text{MHz}$	-	2.5	-	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=30V,$ Frequency=1.0MHz	-	740	960	μF
C_{oss}	Output Capacitance		-	45	-	
C_{rss}	Reverse Transfer Capacitance		-	24	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=30V, R_L=30\Omega,$ $I_{DS}=1A, V_{GEN}=10V,$ $R_G=6\Omega$	-	11	20	ns
t_r	Turn-on Rise Time		-	6	11	
$t_{d(OFF)}$	Turn-off Delay Time		-	27	49	
t_f	Turn-off Fall Time		-	5	10	
Gate Charge Characteristics ^e						
Q_g	Total Gate Charge	$V_{DS}=30V, V_{GS}=4.5V,$ $I_{DS}=4A$	-	7.7	-	nC
Q_g	Total Gate Charge	$V_{DS}=30V, V_{GS}=10V,$ $I_{DS}=4A$	-	16	23	
Q_{gs}	Gate-Source Charge		-	2.5	-	
Q_{gd}	Gate-Drain Charge		-	3	-	

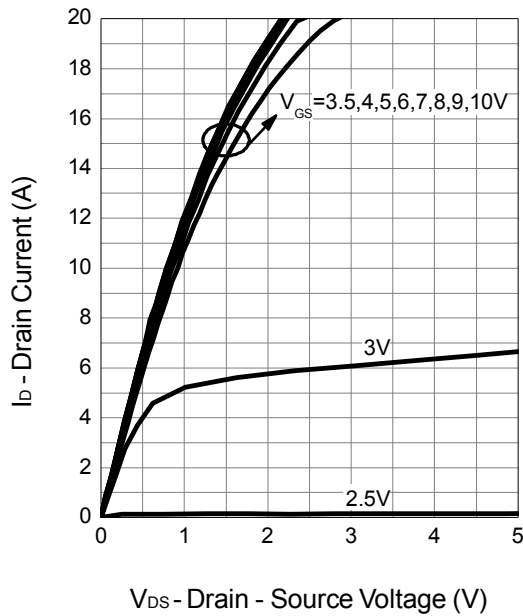
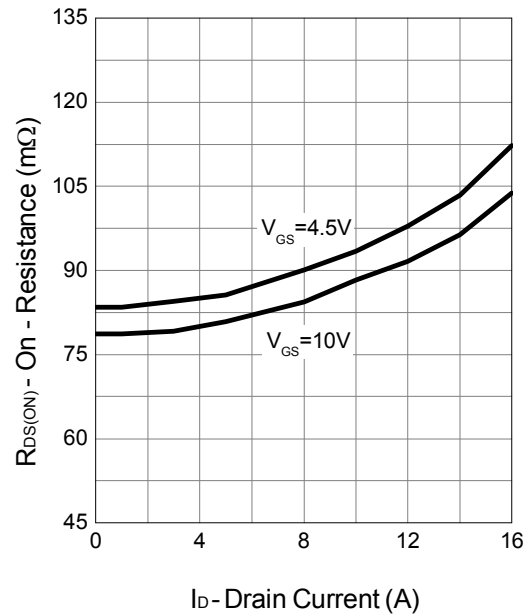
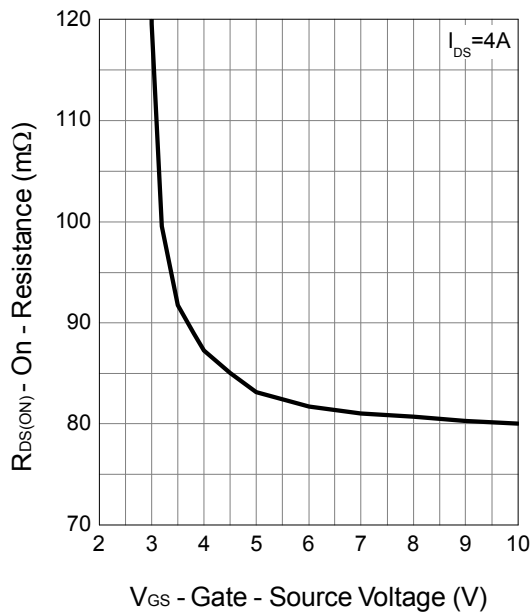
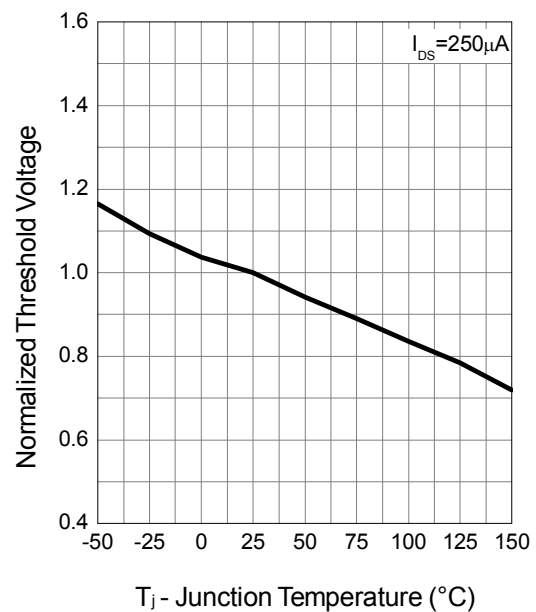
Note d : Pulse test ; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Note e : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

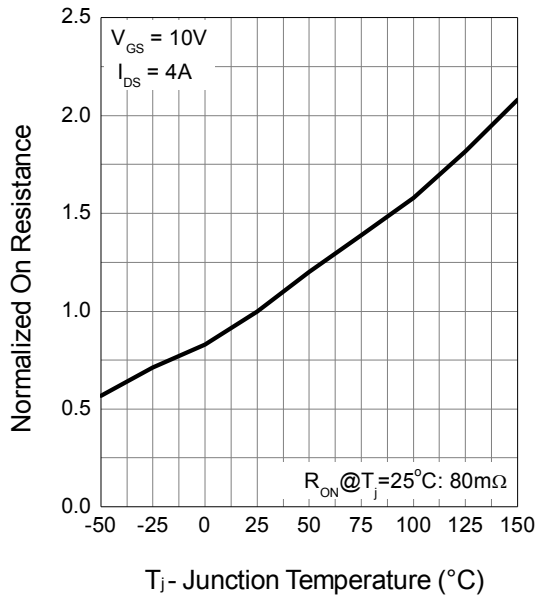


Typical Operating Characteristics (Cont.)

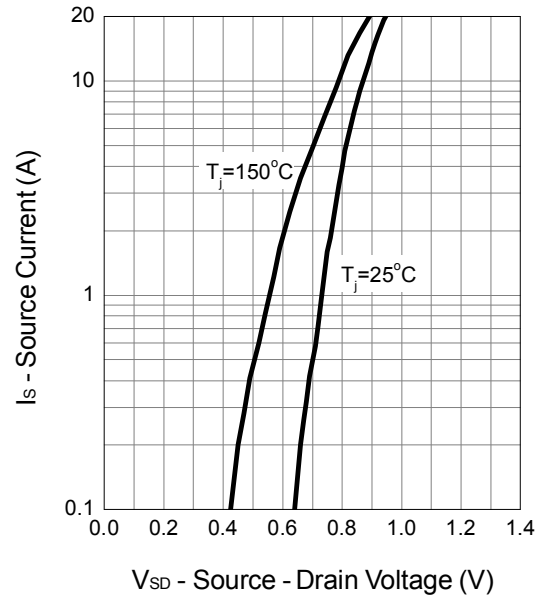
Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


Typical Operating Characteristics (Cont.)

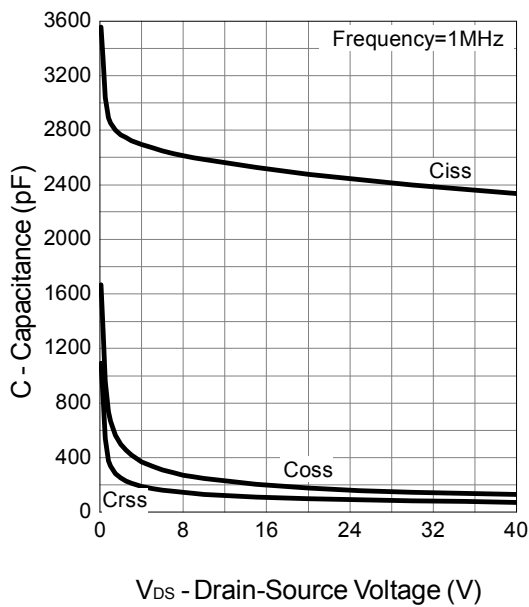
Drain-Source On Resistance



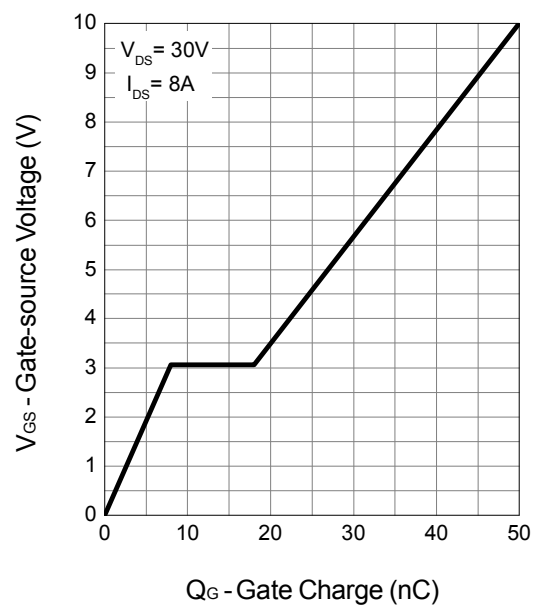
Source-Drain Diode Forward



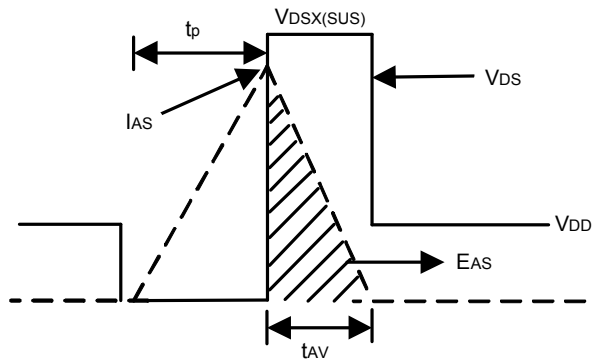
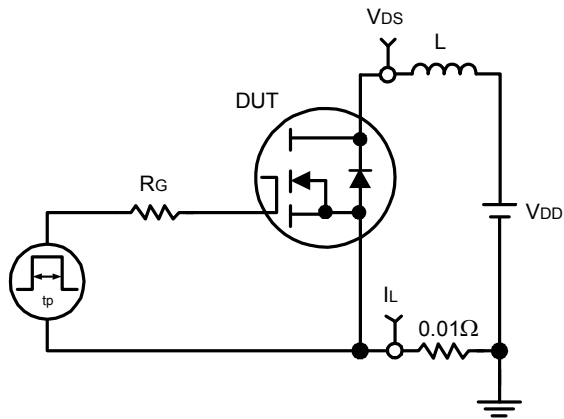
Capacitance



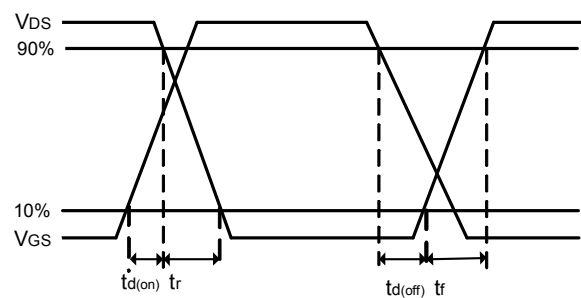
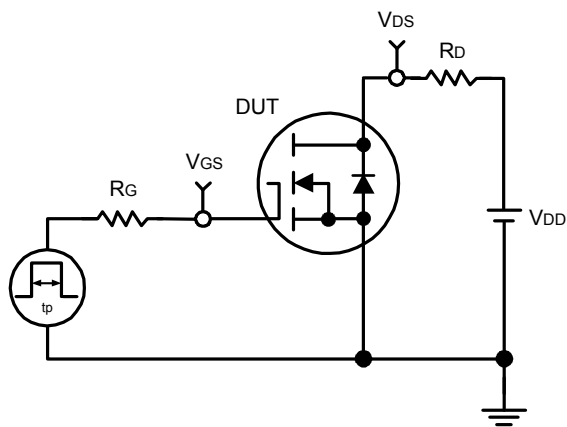
Gate Charge



Avalanche Test Circuit and Waveforms

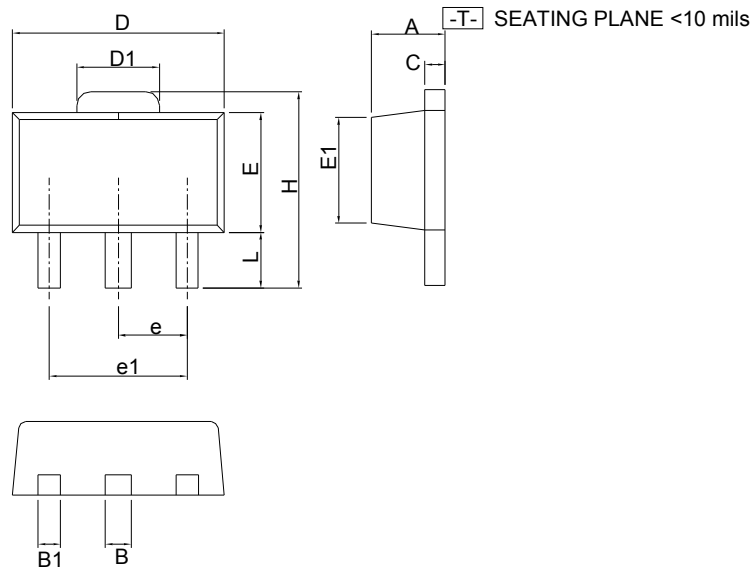


Switching Time Test Circuit and Waveforms



Package Information

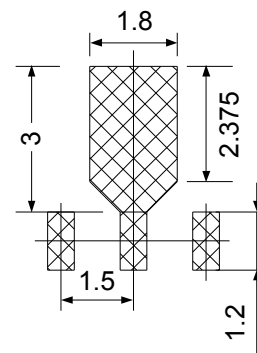
SOT-89



SYMBOL	SOT-89			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	1.40	1.60	0.055	0.063
B	0.44	0.56	0.017	0.022
B1	0.36	0.48	0.014	0.019
C	0.35	0.44	0.014	0.017
D	4.40	4.60	0.173	0.181
D1	1.62	1.83	0.064	0.072
E	2.29	2.60	0.090	0.102
E1	2.13	2.29	0.084	0.090
e	1.50 BSC		0.059 BSC	
e1	3.00 BSC		0.118 BSC	
H	3.94	4.25	0.155	0.167
L	0.89	1.20	0.035	0.047

Note : Follow JEDEC TO-243 AA.

RECOMMENDED LAND PATTERN



UNIT: mm

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