

Features

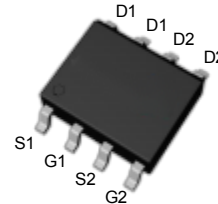
- -20V/-13A,
 $R_{DS(ON)} = 12m\Omega (typ.) @ V_{GS} = -10V$
 $R_{DS(ON)} = 17m\Omega (typ.) @ V_{GS} = -4.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

Note : The diode connected between the gate and source serves only as protection against ESD. No gate overvoltage rating is implied.

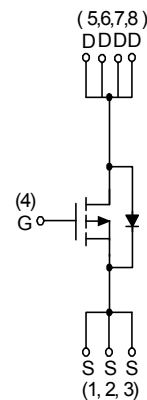
Applications

- Power Management in Notebook Computer, Portable Equipment and Battery Powered Systems.

Pin Description



Top View of SOP-8



P-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		-20	V
V _{GSS}	Gate-Source Voltage		±12	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	
I _S	Diode Continuous Forward Current	T _A =25°C	-13	A
I _D	Continuous Drain Current	T _A =25°C	-13	
		T _A =70°C	-7.8	
I _{DM} ^a	Pulsed Drain Current	T _A =25°C	-39	
P _D	Maximum Power Dissipation	T _A =25°C	2.5	W
		T _A =70°C	1.6	
R _{θJA}	Thermal Resistance-Junction to Ambient	t ≤ 10s	50	°C/W
		Steady State	90	
R _{θJL}	Thermal Resistance-Junction to Lead	Steady State	20	
I _{AS} ^b	Avalanche Current, Single pulse	L=0.1mH	24	A
		L=0.5mH	14	
E _{AS} ^b	Avalanche Energy, Single pulse	L=0.1mH	29	mJ
		L=0.5mH	49	

Note a : Pulse width is limited by maximum junction temperature.

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

Electrical Characteristics (T_A = 25°C unless otherwise noted)

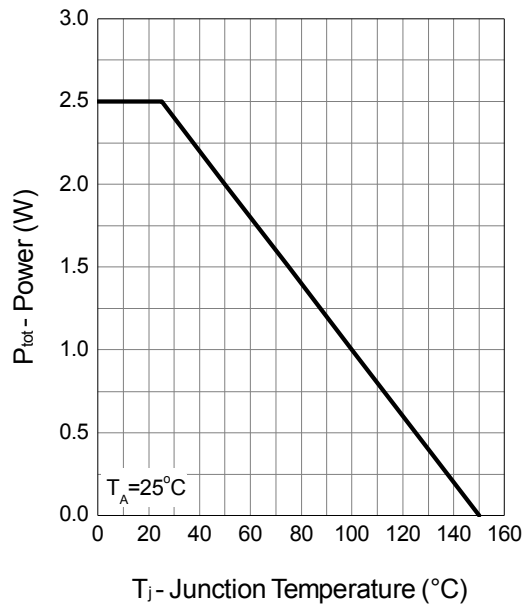
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-16V, V _{GS} =0V T _J =85°C	-	-	-1 -30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-0.5	-0.9	-1.3	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^c	Drain-Source On-state Resistance	V _{GS} =-4.5V, I _{DS} =-8.9A V _{GS} =-2.5V, I _{DS} =-5.6A	-	12 17	15 20	mΩ
Diode Characteristics						
V _{SD} ^c	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V	-	-0.7	-1	V
t _{rr} ^d	Reverse Recovery Time	I _{SD} =-8.9A,	-	18	-	ns
Q _{rr} ^d	Reverse Recovery Charge	dI _{SD} /dt=100A/μs	-	9	-	nC
Dynamic Characteristics ^d						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	3.6	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-15V, Frequency=1.0MHz	-	1004	-	pF
C _{oss}	Output Capacitance		-	204	-	
C _{rss}	Reverse Transfer Capacitance		-	154	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-15V, R _L =15Ω, I _{DS} =-1A, V _{GEN} =-10V, R _G =6Ω	-	8.8	-	ns
t _r	Turn-on Rise Time		-	10.4	-	
t _{d(OFF)}	Turn-off Delay Time		-	35.2	-	
t _f	Turn-off Fall Time		-	46.8	-	
Gate Charge Characteristics ^d						
Q _g	Total Gate Charge	V _{DS} =-15V, V _{GS} =-10V, I _{DS} =-8.9A	-	20	-	nC
	Total Gate Charge		-	10	-	
Q _{gs}	Gate-Source Charge	V _{DS} =-15V, V _{GS} =-4.5V,	-	3.8	-	
Q _{gd}	Gate-Drain Charge	I _{DS} =-8.9A	-	5.7	-	
Q _{gth}	Threshold Gate Charge		-	1	-	

Note c : Pulse test; pulse width≤300μs, duty cycle≤2%.

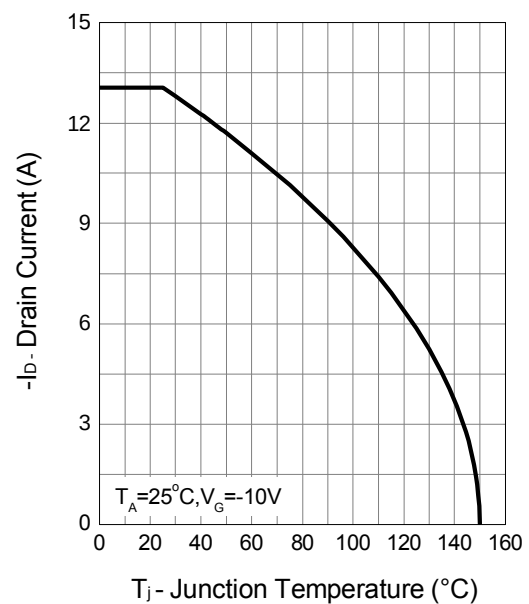
Note d : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

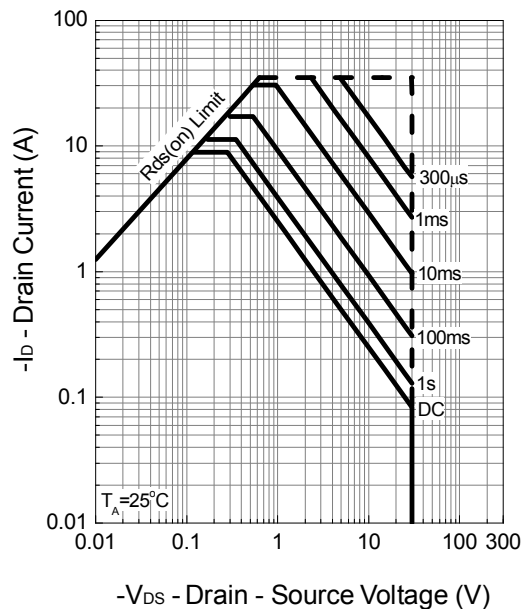
Power Dissipation



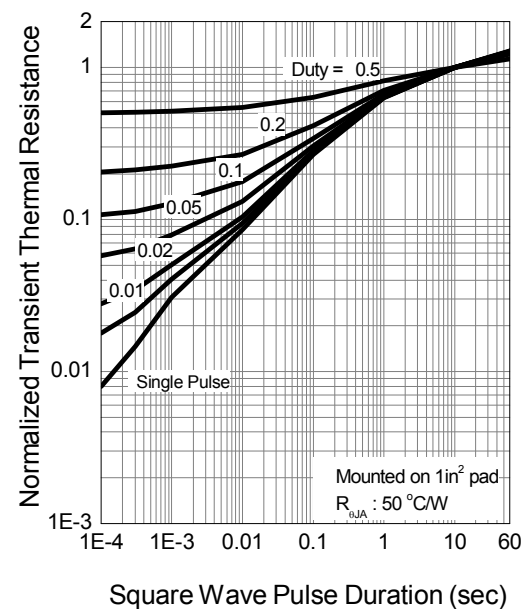
Drain Current



Safe Operation Area

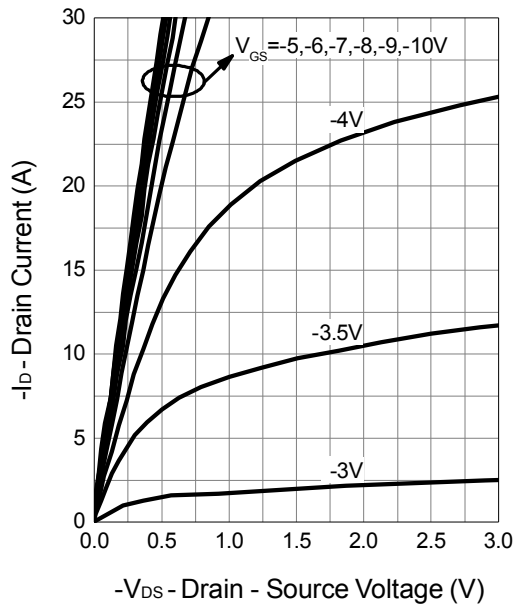


Thermal Transient Impedance

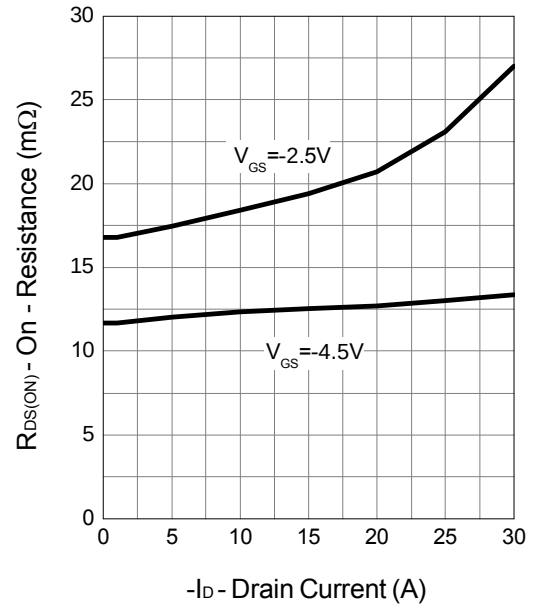


Typical Operating Characteristics (Cont.)

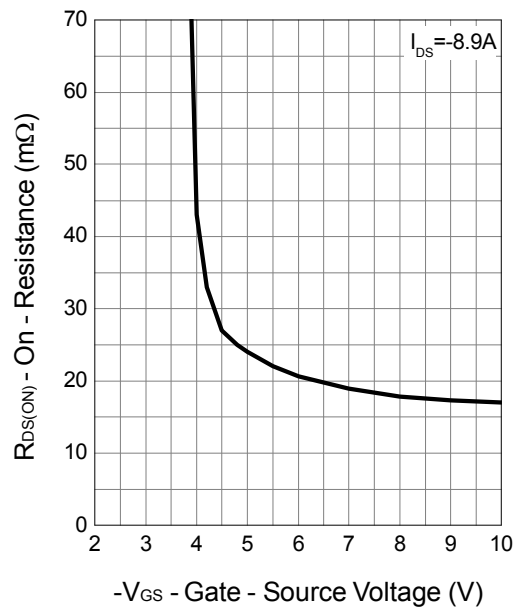
Output Characteristics



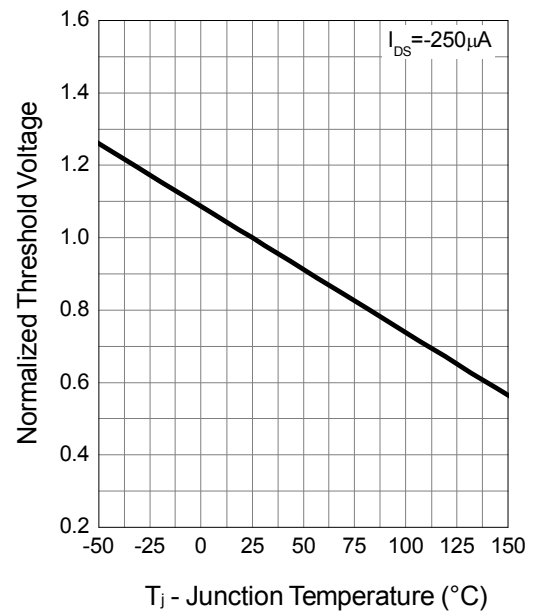
Drain-Source On Resistance



Gate-Source On Resistance

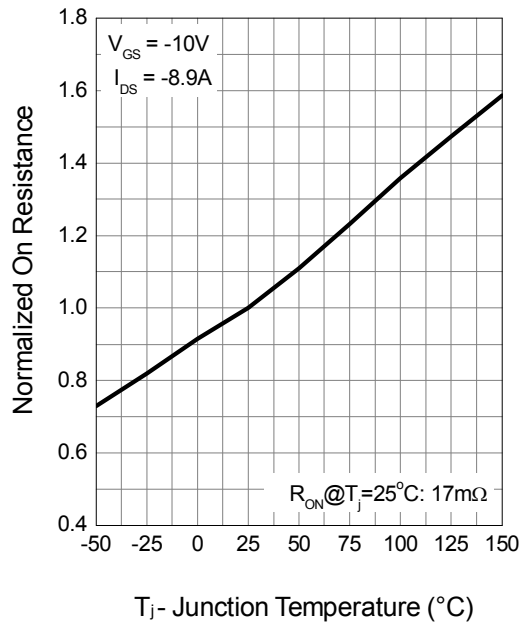


Gate Threshold Voltage

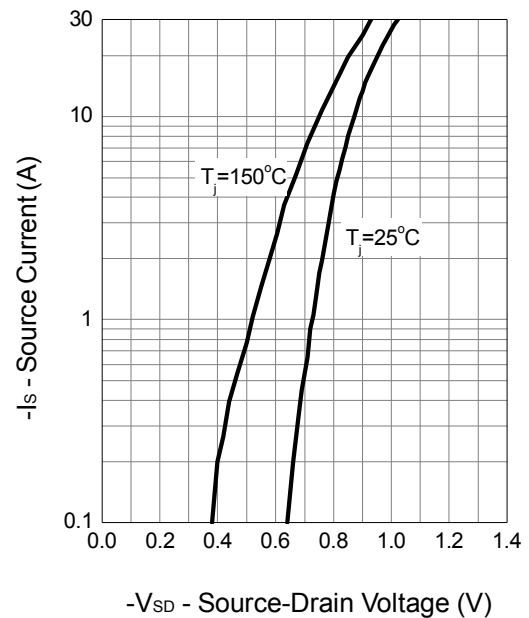


Typical Operating Characteristics (Cont.)

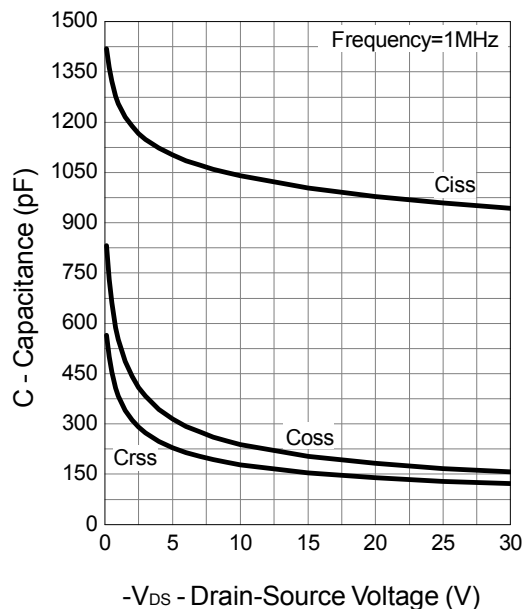
Drain-Source On Resistance



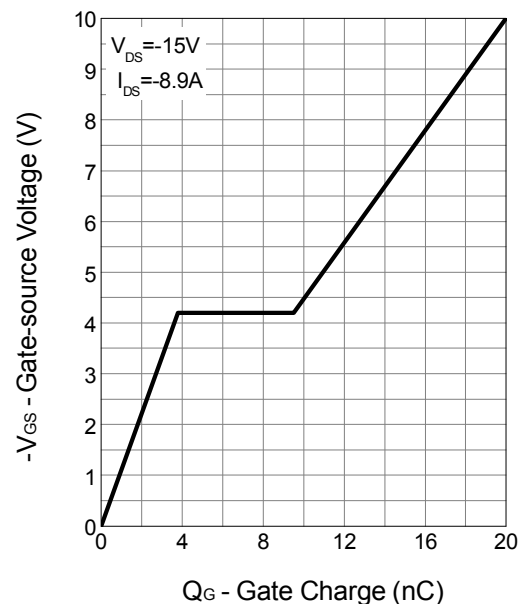
Source-Drain Diode Forward



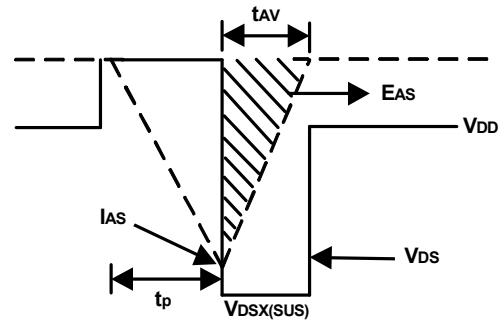
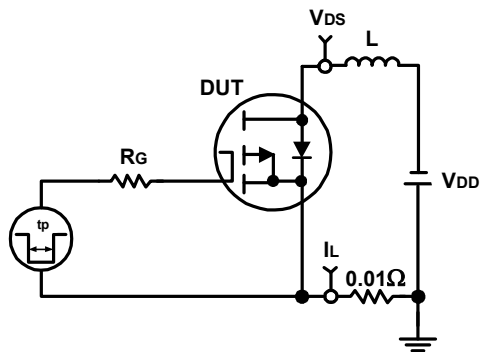
Capacitance



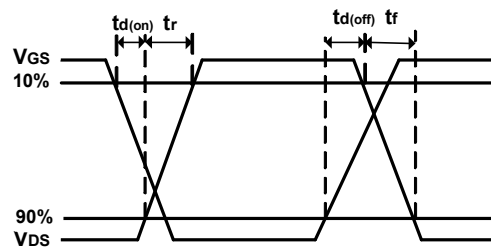
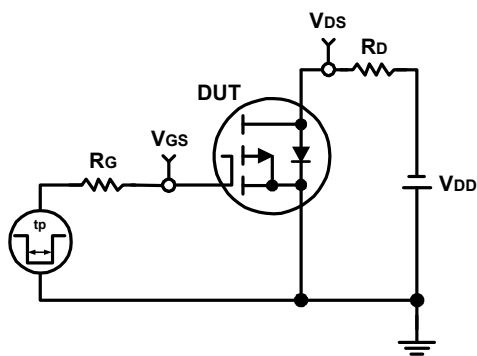
Gate Charge



Avalanche Test Circuit and Waveforms

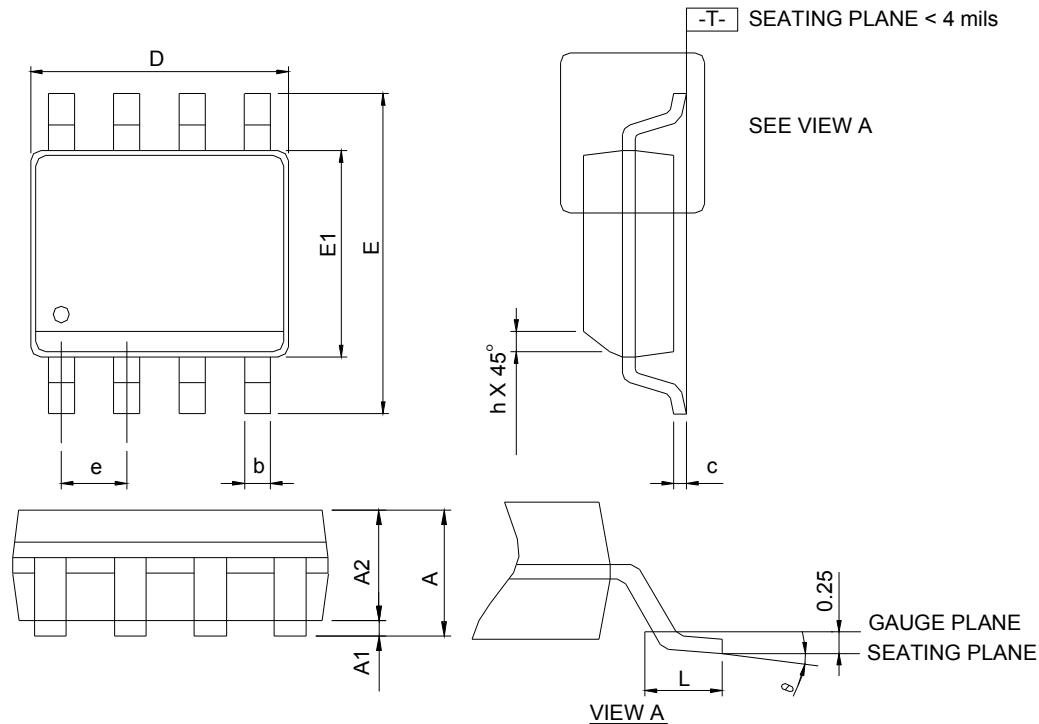


Switching Time Test Circuit and Waveforms



Package Information

SOP-8



SOP-8	SOP-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	-	1.75	-	0.069
A1	0.10	0.25	0.004	0.010
A2	1.25	-	0.049	-
b	0.31	0.51	0.012	0.020
c	0.17	0.25	0.007	0.010
D	4.80	5.00	0.189	0.197
E	5.80	6.20	0.228	0.244
E1	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
h	0.25	0.50	0.010	0.020
L	0.40	1.27	0.016	0.050
θ	0°	8°	0°	8°

Note: 1. Follow JEDEC MS-012 AA.

2. Dimension "D" does not include mold flash, protrusions or gate burrs. Mold flash, protrusion or gate burrs shall not exceed 6 mil per side.

3. Dimension "E" does not include inter-lead flash or protrusions. Inter-lead flash and protrusions shall not exceed 10 mil per side.

RECOMMENDED LAND PATTERN

