

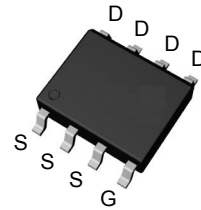
Features

- 40V/12.5A,
 $R_{DS(ON)} = 7 \text{ m}\Omega$ (typ.) @ $V_{GS} = 10\text{V}$
 $R_{DS(ON)} = 9 \text{ m}\Omega$ (typ.) @ $V_{GS} = 4.5\text{V}$
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

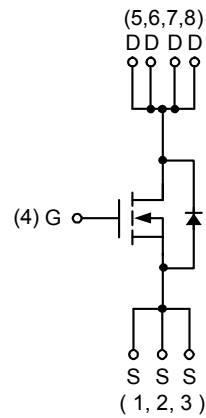
Applications

- Power Management in Desktop Computer or DC/DC Converters.

Pin Description



Top View of SOP-8



N-Channel MOSFET

Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		40	V
V _{GSS}	Gate-Source Voltage		±20	
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	12.5	A
I _D	Continuous Drain Current	T _A =25°C	12.5	A
		T _A =70°C	8.4	
I _{DM} ^a	Pulsed Drain Current	T _A =25°C	37.5	
P _D	Maximum Power Dissipation	T _A =25°C	2.08	W
		T _A =70°C	1.3	
R _{θJA}	Thermal Resistance-Junction to Ambient	t ≤ 10s	30	°C/W
		Steady State	60	
R _{θJL}	Thermal Resistance-Junction to Lead	Steady State	20	
I _{AS} ^b	Avalanche Current, Single pulse	L=0.1mH	23	A
E _{AS} ^b	Avalanche Energy, Single pulse	L=0.1mH	26	mJ

Note a : Max. current is limited by bonding wire.

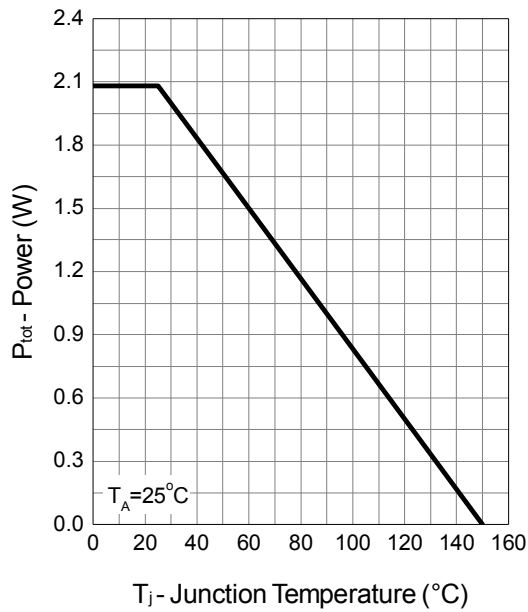
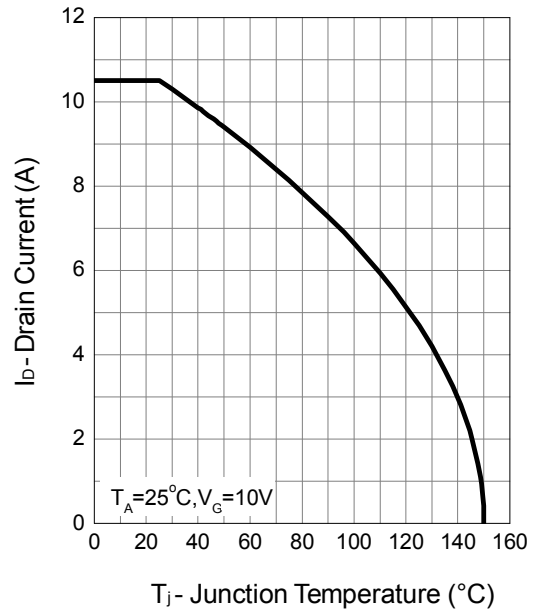
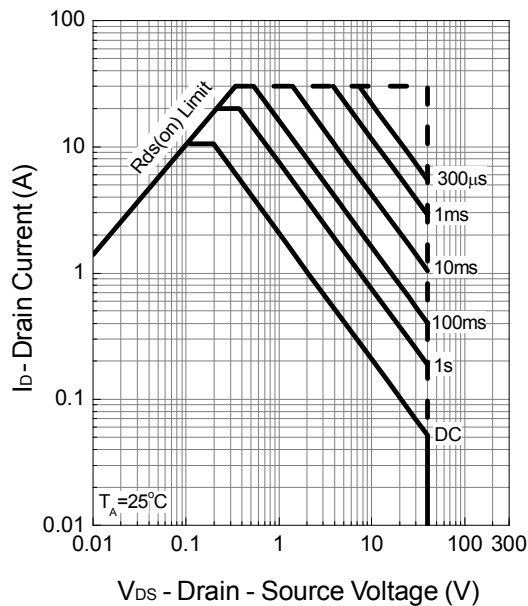
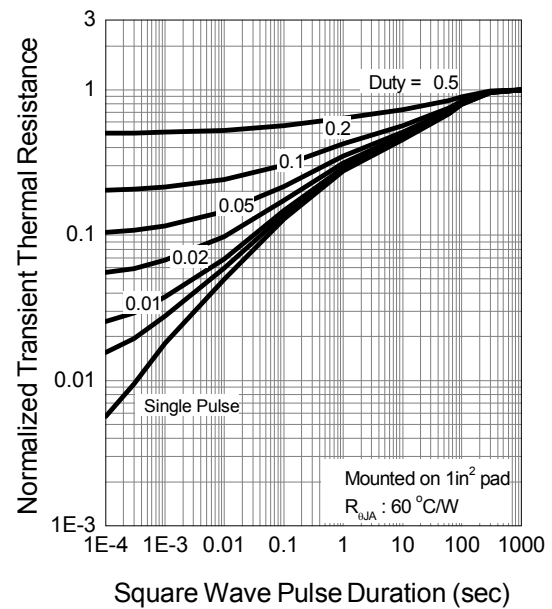
Note b : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature T_J=25°C).

Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

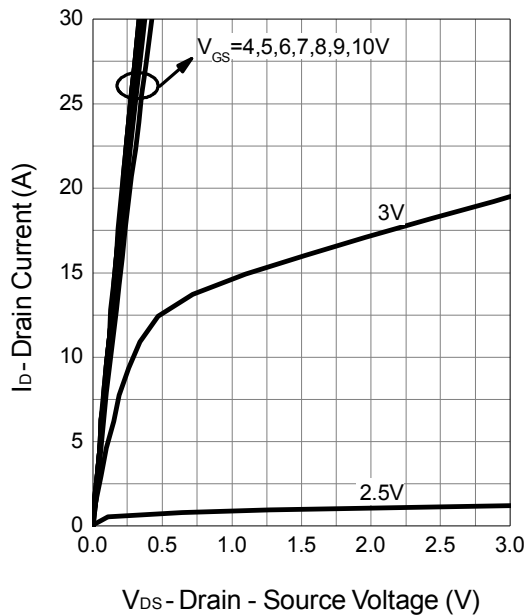
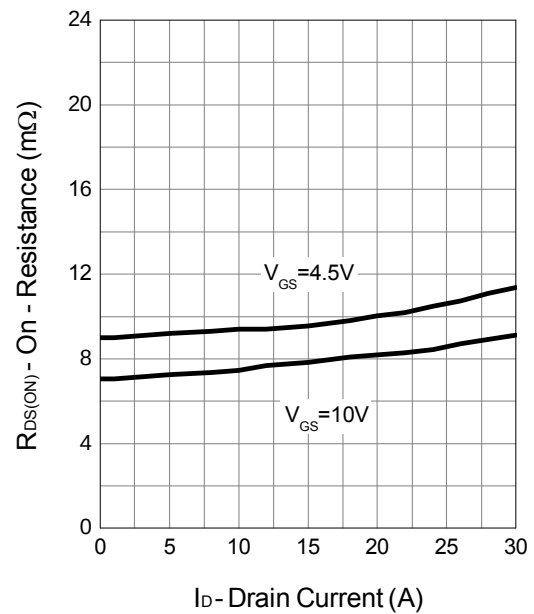
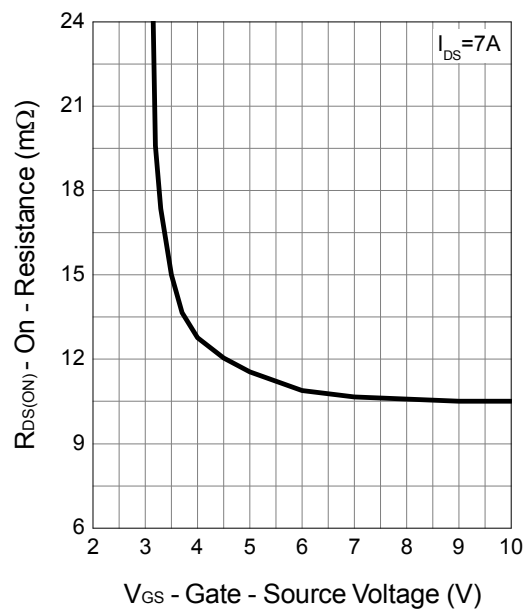
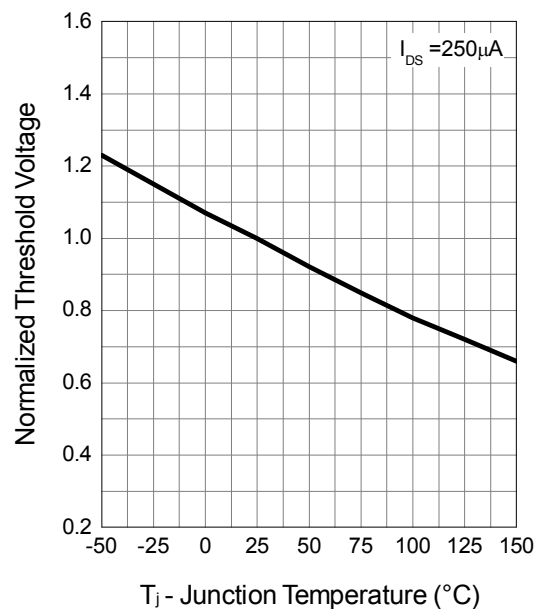
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =32V, V _{GS} =0V	-	-	1	μA
		T _J =85°C	-	-	30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.5	1.8	2.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^c	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =7A	-	7	10	mΩ
		T _J =125°C	-	10.75	-	
		V _{GS} =4.5V, I _{Ds} =5A	-	9	12	
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =15A	-	31	-	S
Diode Characteristics						
V _{SD} ^c	Diode Forward Voltage	I _{SD} =10A, V _{GS} =0V	-	0.9	1.1	V
t _{rr}	Reverse Recovery Time	V _{DD} =20V, I _{SD} =10A, dl _{SD} /dt=100A/μs	-	15.2	-	ns
t _a	Charge Time		-	9.4	-	
t _b	Discharge Time		-	5.8	-	
Q _{rr}	Reverse Recovery Charge		-	9.5	-	nC
Dynamic Characteristics ^d						
R _G	Gate Resistance	V _{GS} =0V,V _{DS} =0V,F=1MHz	0.7	1.1	1.8	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =20V, Frequency=1.0MHz	-	1125	-	pF
C _{oss}	Output Capacitance		-	132	-	
C _{rss}	Reverse Transfer Capacitance		-	70	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =20V, R _L =20Ω, I _{DS} =1A, V _{GEN} =10V, R _G =1Ω	-	12.6	-	ns
t _r	Turn-on Rise Time		-	10	-	
t _{d(OFF)}	Turn-off Delay Time		-	23.6	-	
t _f	Turn-off Fall Time		-	6	-	
Gate Charge Characteristics ^d						
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =4.5V, I _{DS} =7A	-	9.4	-	nC
Q _g	Total Gate Charge	V _{DS} =20V, V _{GS} =10V, I _{DS} =7A	-	20	28	
Q _{gth}	Threshold Gate Charge		-	2	-	
Q _{gs}	Gate-Source Charge		-	3.9	-	
Q _{gd}	Gate-Drain Charge		-	3	-	

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

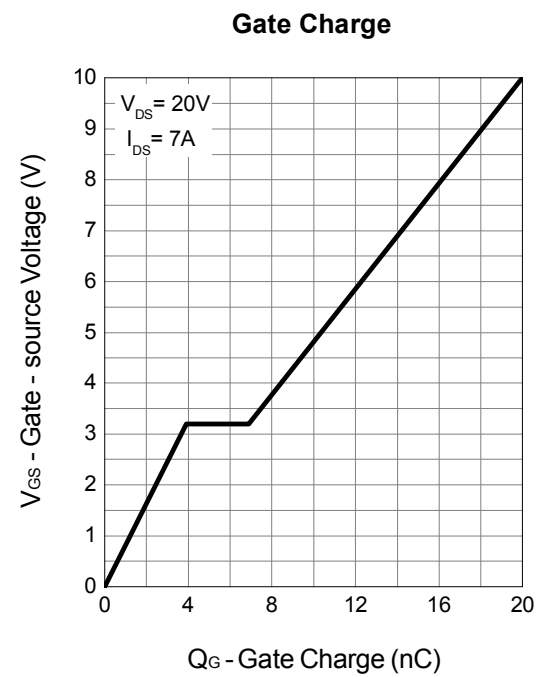
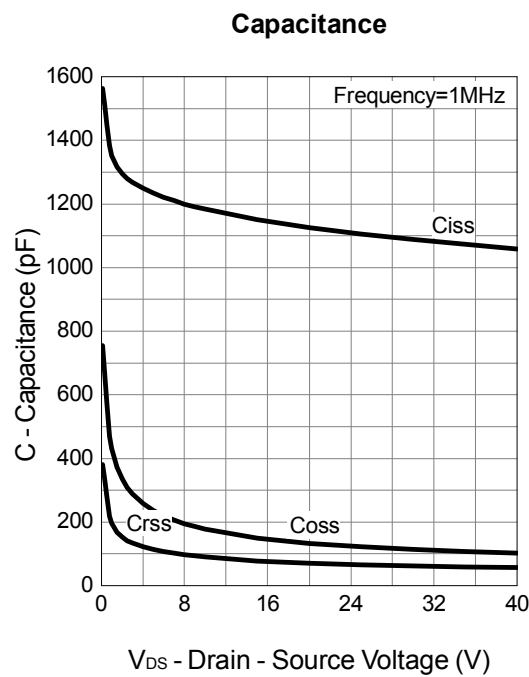
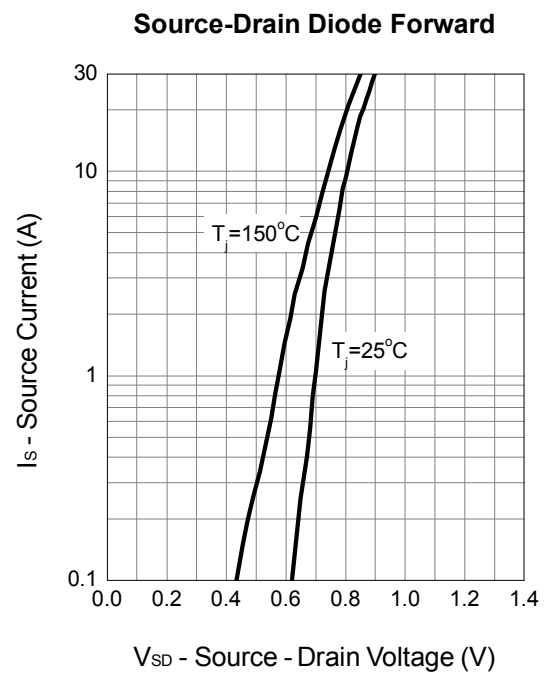
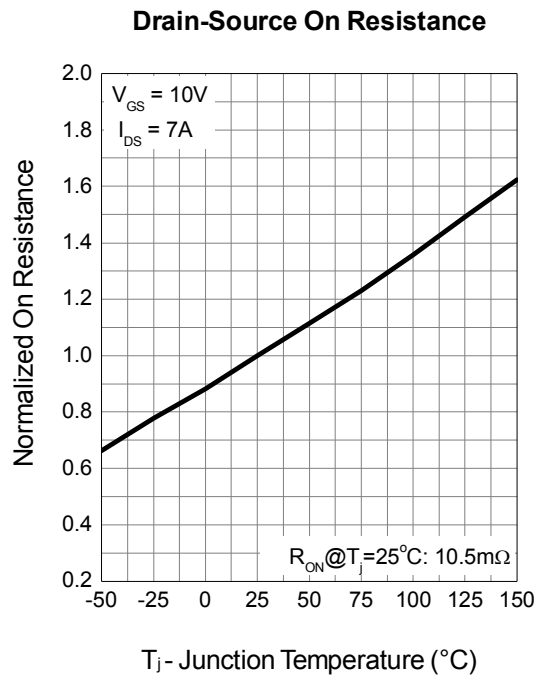
Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


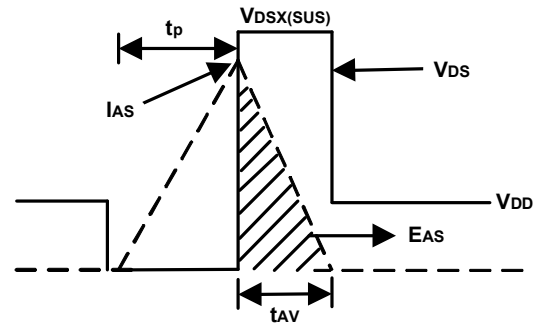
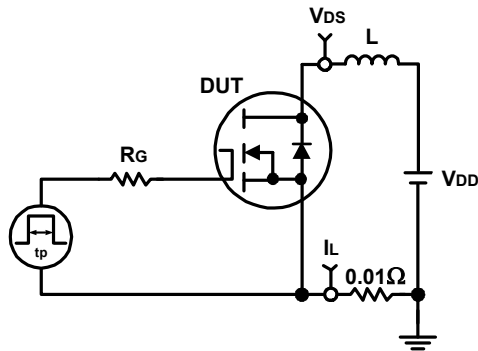
Typical Operating Characteristics (Cont.)

Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


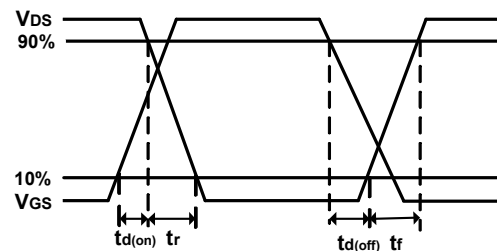
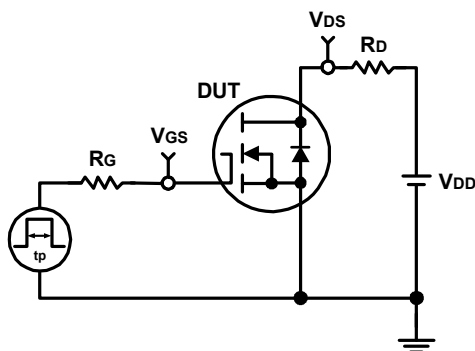
Typical Operating Characteristics (Cont.)



Avalanche Test Circuit and Waveforms

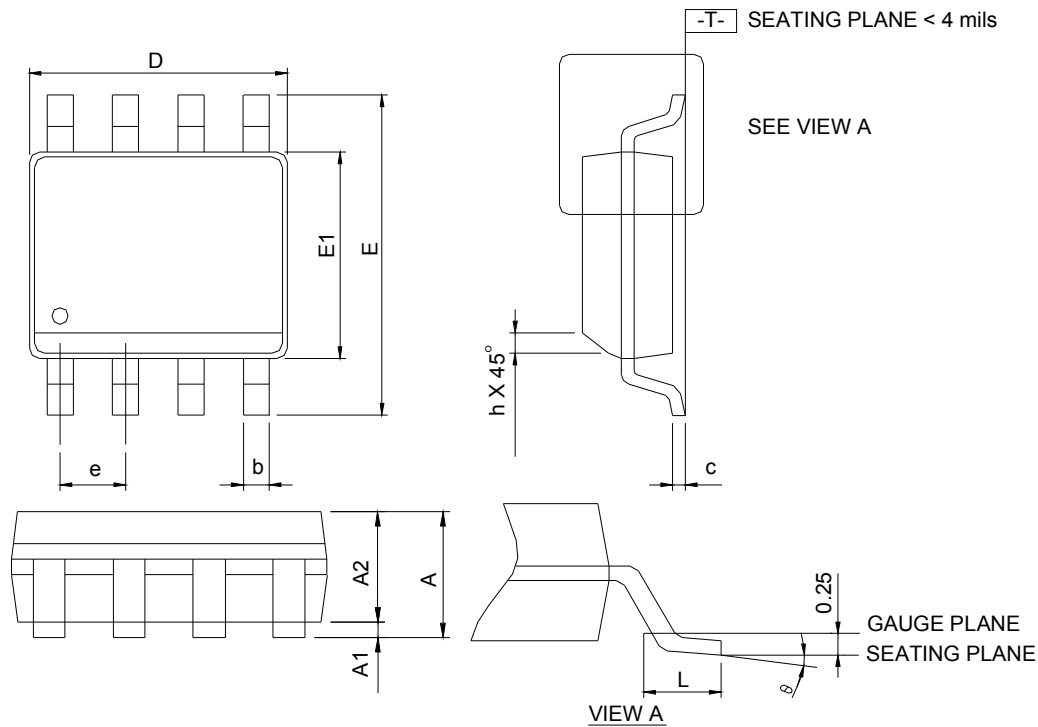


Switching Time Test Circuit and Waveforms



Package Information

SOP-8



DIMENSIONS	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

