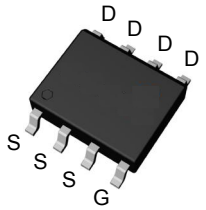
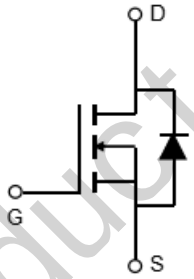
Features

- 40V/12.5A,
  $R_{DS(ON)}$= 8.5mΩ (Typ.) @ V_{GS}=10V
  $R_{DS(ON)}$= 10mΩ (Typ.) @ V_{GS}=4.5V
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

Pin Description



Top View of SOP-8



N-Channel MOSFET

Applications

- Power Management in Desktop Computer or DC/DC Converters.
- Power Load Switch.
- Notebook Battery Management.

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	2	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	30	
P_D	Maximum Power Dissipation	T_A=25°C	2.08	W
		T_A=70°C	1.3	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	t ≤ 10s	30	°C/W
		Steady State	60	
$R_{\theta JL}$	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).

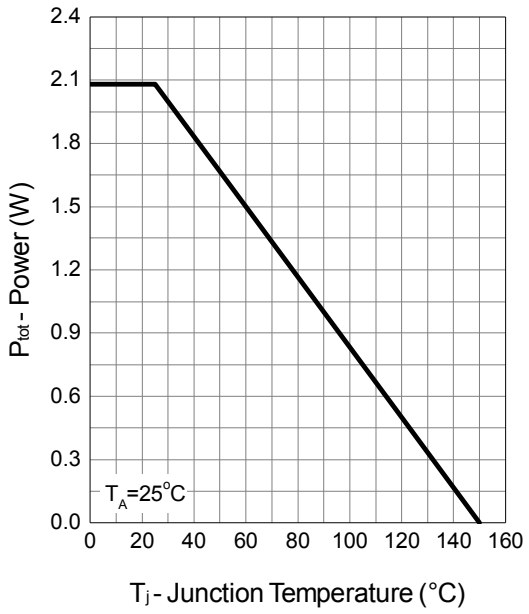
Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

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	-	8.5	10.5	mΩ
		T_J=125°C	-	12.75	-	
		V_{GS}=4.5V, I_{DS}=5A	-	10	12.5	
Gfs	Forward Transconductance	V_{DS}=5V, I_{DS}=15A	-	30	-	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, dI_{SD}/dt=100A/μs	-	16.2	-	ns
t_a	Charge Time		-	9.4	-	
t_b	Discharge Time		-	6.8	-	
Q_{rr}	Reverse Recovery Charge		-	9.8	-	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	-	1325	-	pF
C_{oss}	Output Capacitance		-	142	-	
C_{rss}	Reverse Transfer Capacitance		-	90	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=20V, R_L=20Ω, I_{DS}=1A, V_{GEN}=10V, R_G=1Ω	-	14.6	-	ns
t_r	Turn-on Rise Time		-	12	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	24.6	-	
t_f	Turn-off Fall Time		-	8	-	
Gate Charge Characteristics [d]						
Q_g	Total Gate Charge	V_{DS}=20V, V_{GS}=4.5V, I_{DS}=7A	-	9.9	-	nC
Q_g	Total Gate Charge	V_{DS}=20V, V_{GS}=10V, I_{DS}=7A	-	21	28	
Q_{gth}	Threshold Gate Charge		-	2	-	
Q_{gs}	Gate-Source Charge		-	4.9	-	
Q_{gd}	Gate-Drain Charge		-	5	-	

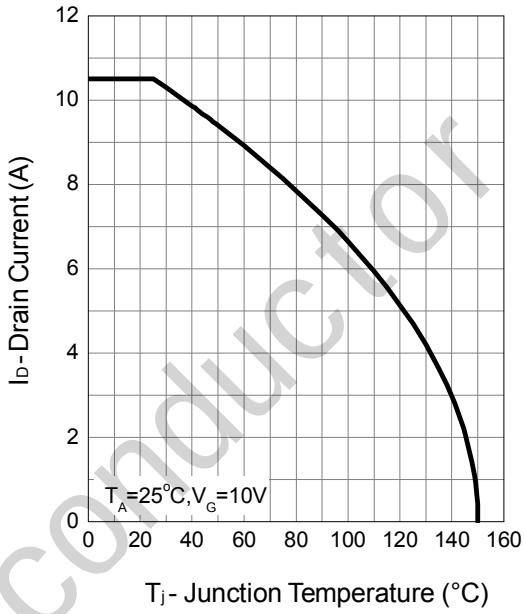
Note c：Pulse test ; pulse width≤300μs, duty cycle≤2%.

Typical Operating Characteristics

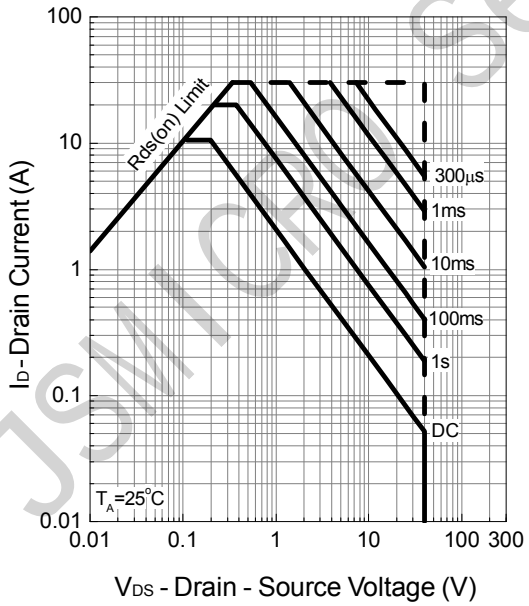
Power Dissipation



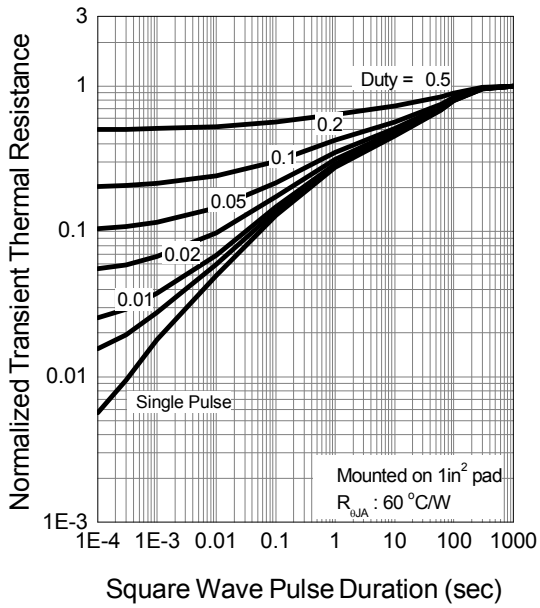
Drain Current



Safe Operation Area

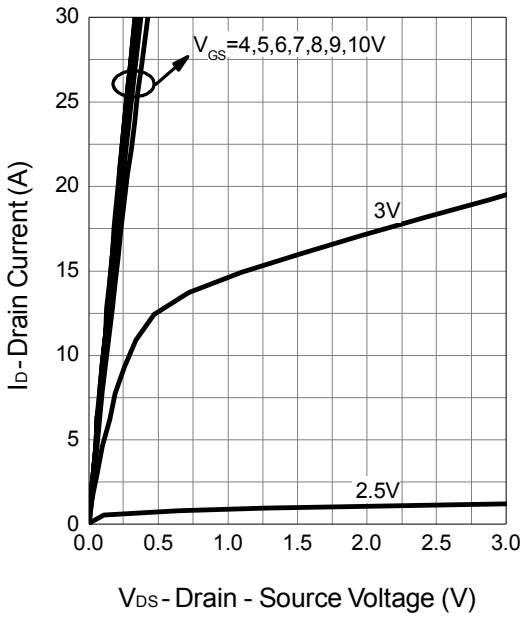


Thermal Transient Impedance

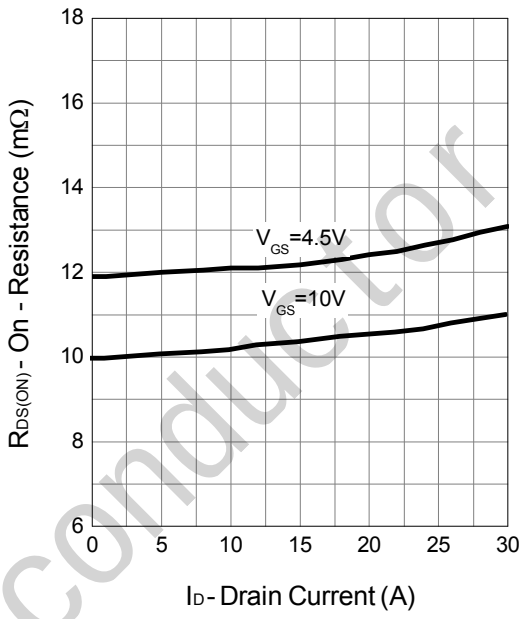


Typical Operating Characteristics (Cont.)

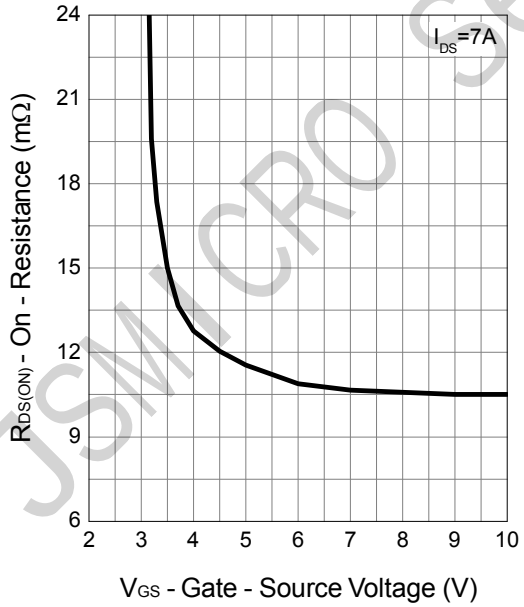
Output Characteristics



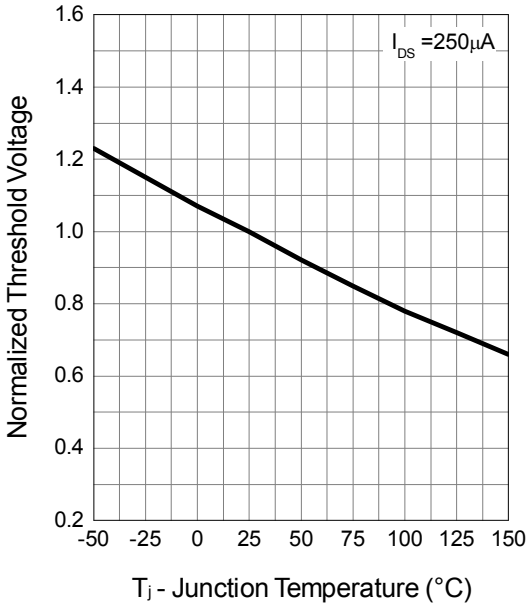
Drain-Source On Resistance



Gate-Source On Resistance

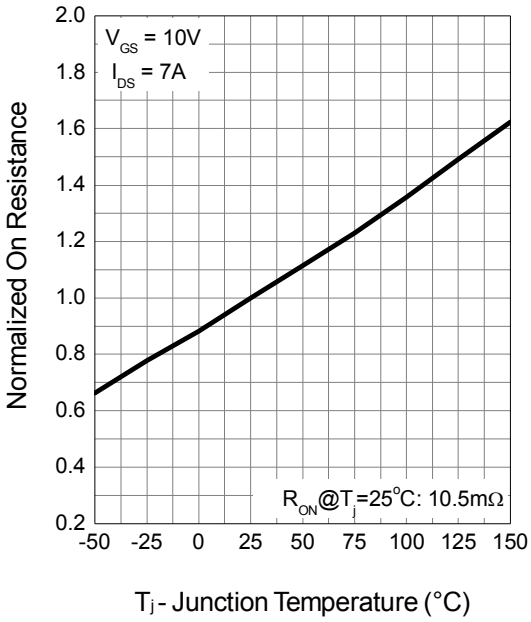


Gate Threshold Voltage

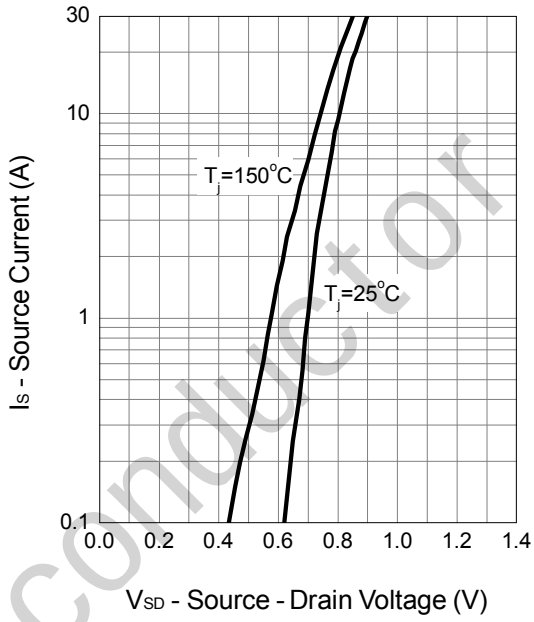


Typical Operating Characteristics (Cont.)

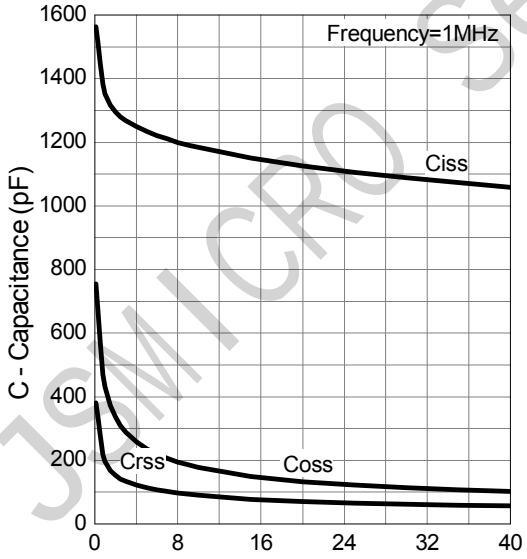
Drain-Source On Resistance



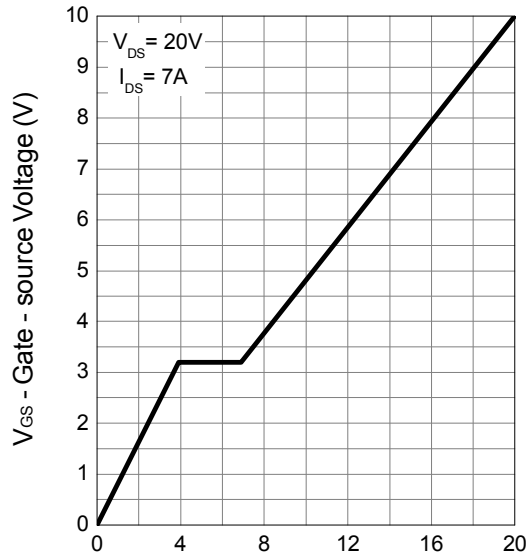
Source-Drain Diode Forward



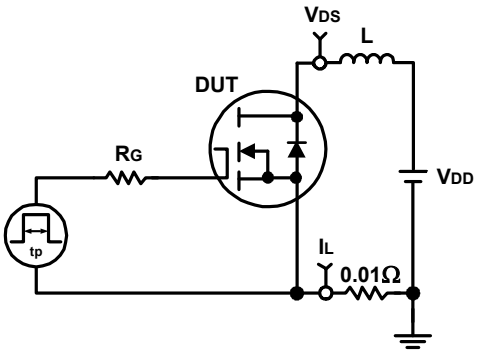
Capacitance

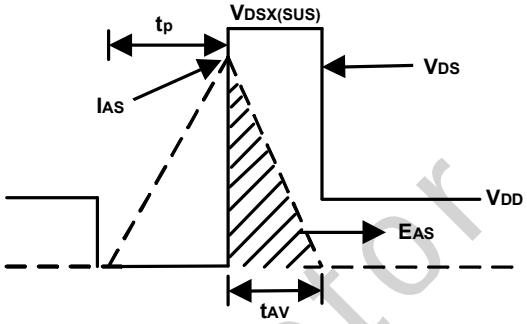


Gate Charge

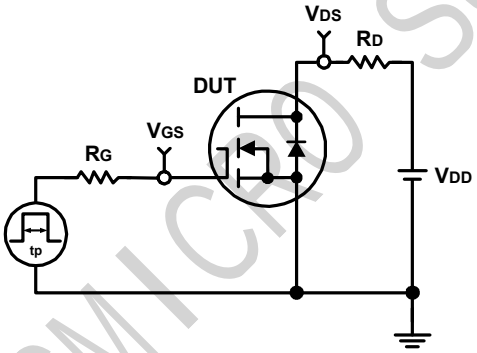


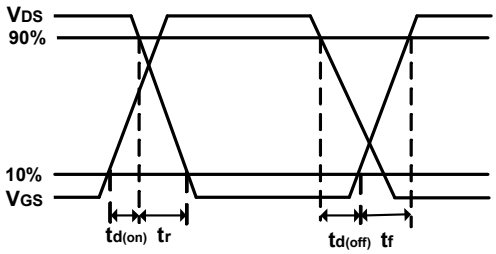
Avalanche Test Circuit and Waveforms



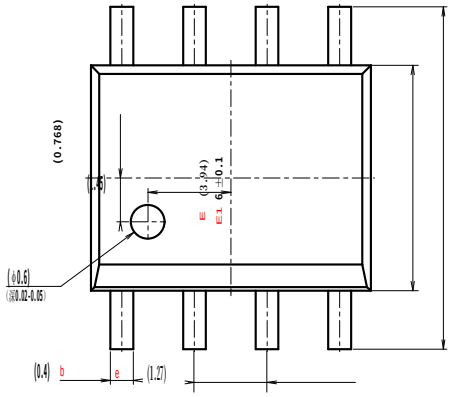


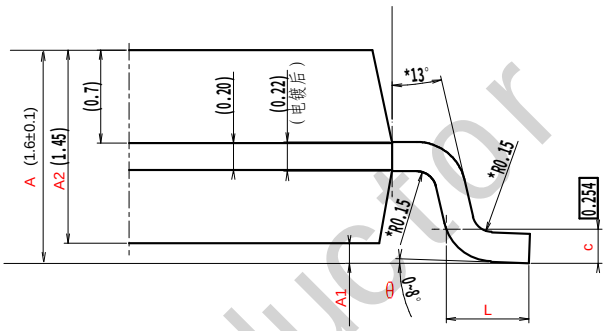
Switching Time Test Circuit and Waveforms

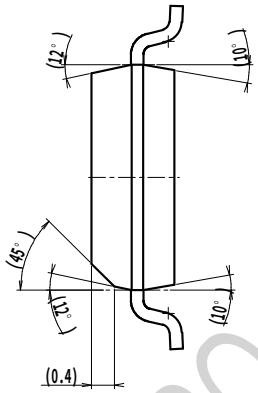




SOP8 PACKAGE OUTLINE







字符	Dimension millimeters		
	Min	Standard	Max
A	1.500	1.600	1.700
A1	0.040	0.080	0.150
A2	1.350	1.450	1.550
b	0.300	0.400	0.500
c	0.220	0.254	0.280
D	4.800	4.900	5.000
E	3.840	3.940	4.040
E1	5.900	6.000	6.100
e		1.27(BSC)	
L	0.400	0.550	0.700
θ	0°		8°