

Dual N-Channel Enhancement Mode MOSFET

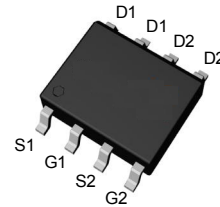
Features

- 30V/8A,
 $R_{DS(ON)} = 19m\Omega(\text{max.}) @ V_{GS} = 10V$
 $R_{DS(ON)} = 25m\Omega(\text{max.}) @ V_{GS} = 4.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
 (RoHS Compliant)

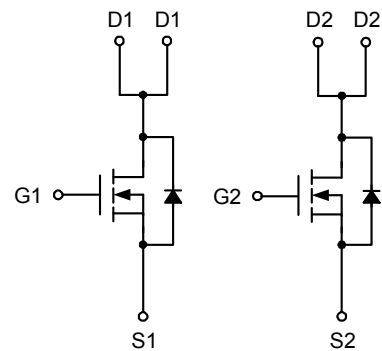
Applications

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

Pin Description



Top View of SOP-8



N-Channel MOSFET

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

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	30	V
V_{GSS}	Gate-Source Voltage	± 20	
I_D^a	Continuous Drain Current ($V_{GS}=10V$)	$T_A=25^\circ\text{C}$	8
		$T_A=70^\circ\text{C}$	6.5
I_{DM}^a	300 μs Pulsed Drain Current ($V_{GS}=10V$)	40	A
I_S^a	Diode Continuous Forward Current	1	
I_{AS}^b	Avalanche Current (Single Pulse)	9	
E_{AS}^b	Avalanche Energy, Single Pulse ($L=0.5mH$)	20	mJ
T_J	Maximum Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	
P_D^a	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	1.7
		$T_A=70^\circ\text{C}$	1.08
$R_{\theta JA}^a$	Thermal Resistance-Junction to Ambient	$t \leq 10s$	48
		Steady State	74
$R_{\theta JL}$	Thermal Resistance-Junction to Lead	Steady State	32

Note a : Surface Mounted on $1in^2$ pad area, $t \leq 10sec$. Maximum Power dissipation is calculated from $R_{\theta JA}$ (worst) = 62.5°C/W under $t \leq 10s$.

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

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

Symbol	Parameter	Test Conditions	TSD4822			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=24V, V_{GS}=0V$	-	-	1	μA
		$T_J=85^\circ\text{C}$	-	-	30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1.3	1.9	2.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
$R_{DS(ON)}^a$	Drain-Source On-state Resistance	$V_{GS}=10V, I_{DS}=8A$	-	16.5	19	m Ω
		$V_{GS}=4.5V, I_{DS}=8A$	-	21	25	
G_{fs}	Forward Transconductance	$V_{DS}=5V, I_{DS}=8A$	-	32	-	S
Diode Characteristics						
V_{SD}^a	Diode Forward Voltage	$I_{SD}=1A, V_{GS}=0V$	-	0.7	1.1	V
t_{rr}^b	Reverse Recovery Time	$I_{SD}=8A, dI_{SD}/dt=100A/\mu s$	-	15.5	-	ns
Q_{rr}^b	Reverse Recovery Charge		-	6.5	-	nC

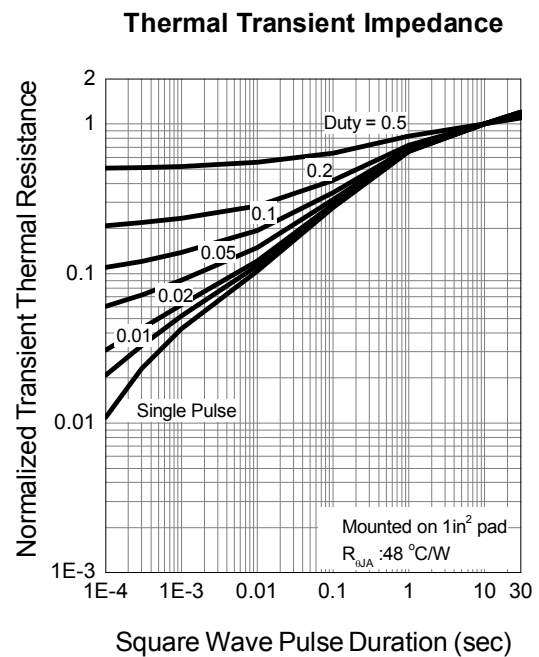
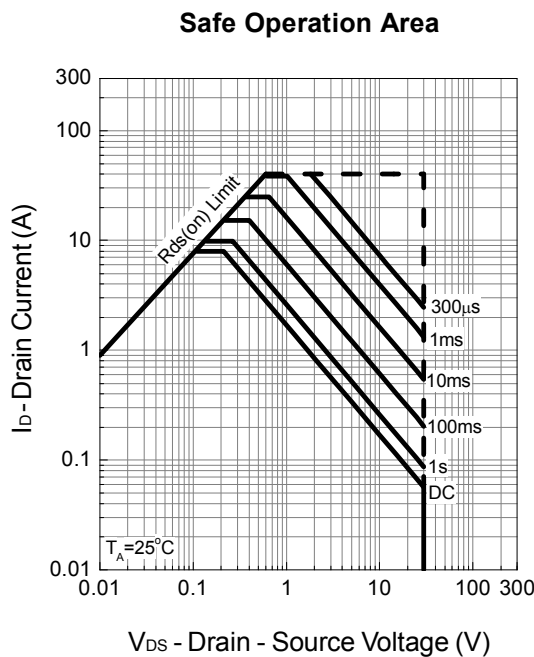
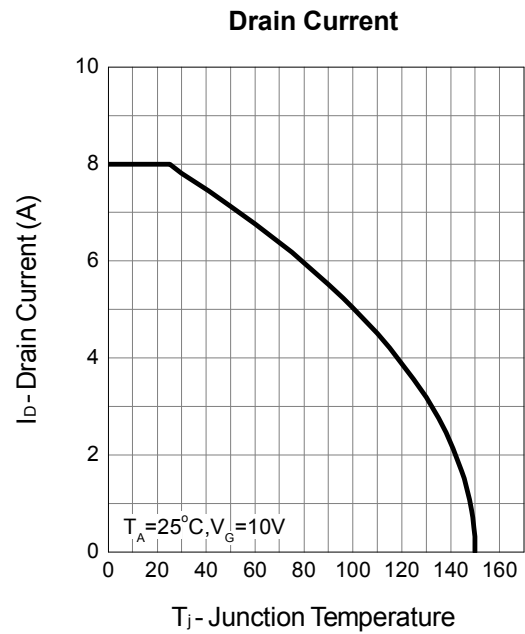
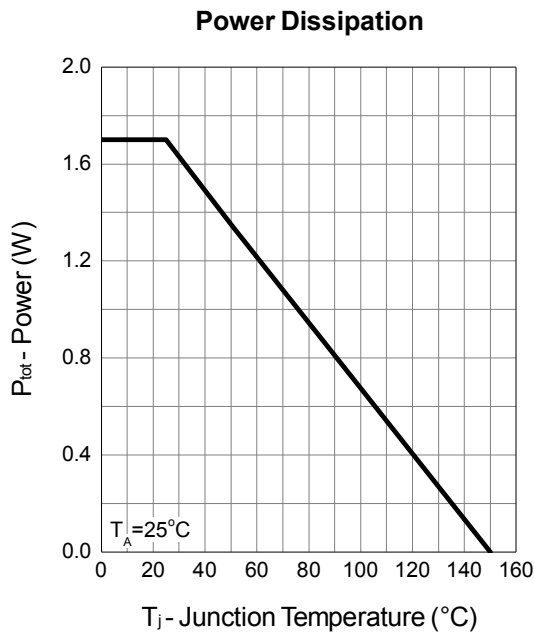
Electrical Characteristics (Cont.) (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	TSD4822			Unit
			Min.	Typ.	Max.	
Dynamic Characteristics^b						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	1.3	1.7	2.3	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	-	580	-	pF
C _{oss}	Output Capacitance		-	95	-	
C _{rss}	Reverse Transfer Capacitance		-	57	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	5.9	10	ns
t _r	Turn-on Rise Time		-	10	17	
t _{d(OFF)}	Turn-off Delay Time		-	17	35	
t _f	Turn-off Fall Time		-	4	9	
Gate Charge Characteristics^b						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =8A	-	10.2	14	nC
	Total Gate Charge		-	5.3	7.5	
Q _{gth}	Threshold Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =8A	-	0.78	-	
Q _{gs}	Gate-Source Charge		-	1.7	-	
Q _{gd}	Gate-Drain Charge		-	2.2	-	

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

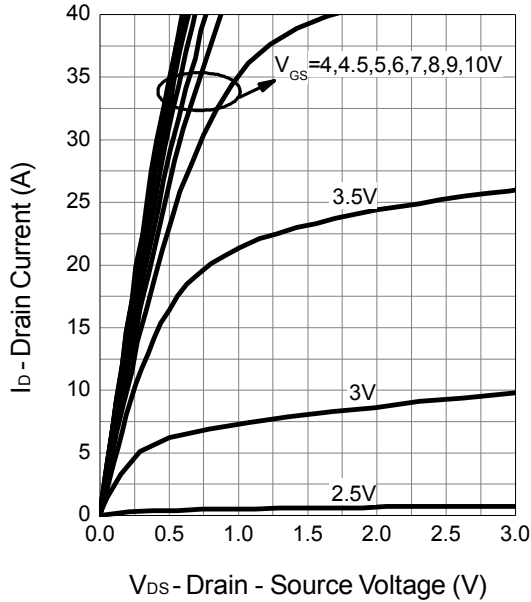
Note b : Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

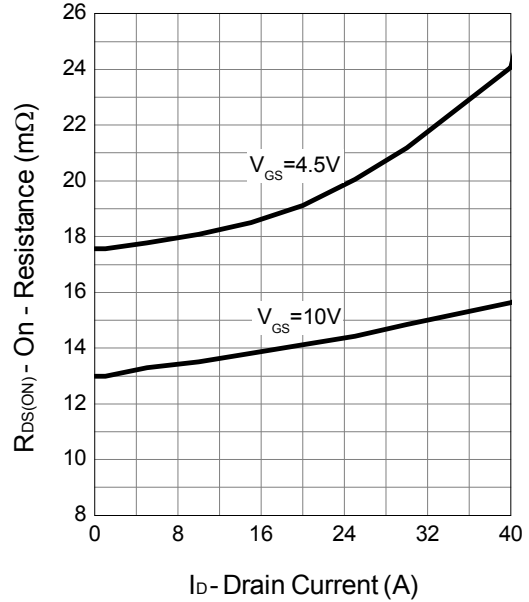


Typical Operating Characteristics (Cont.)

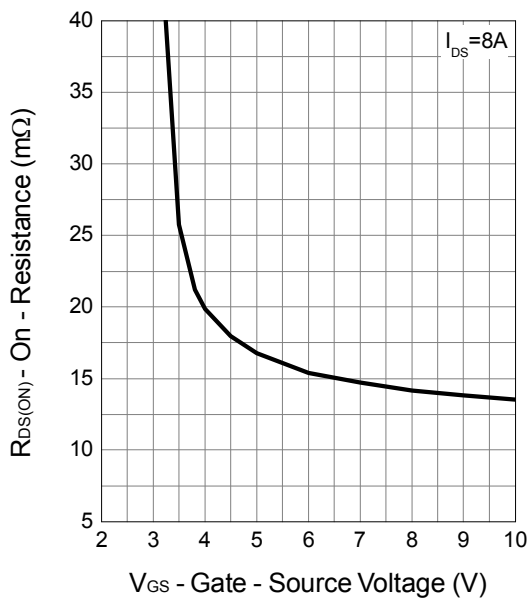
Output Characteristics



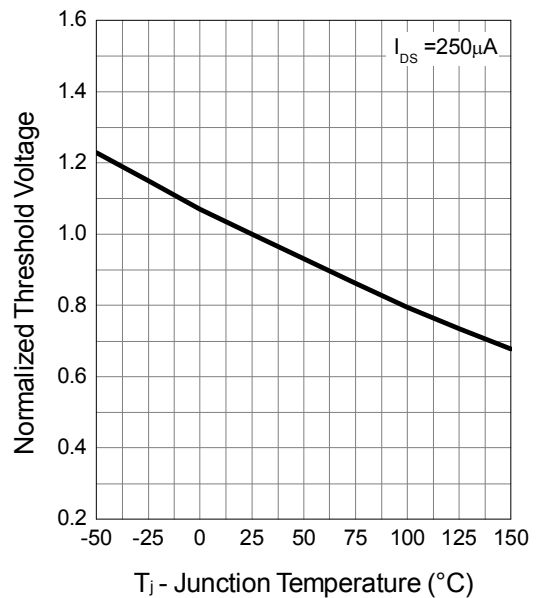
Drain-Source On Resistance



Gate-Source On Resistance

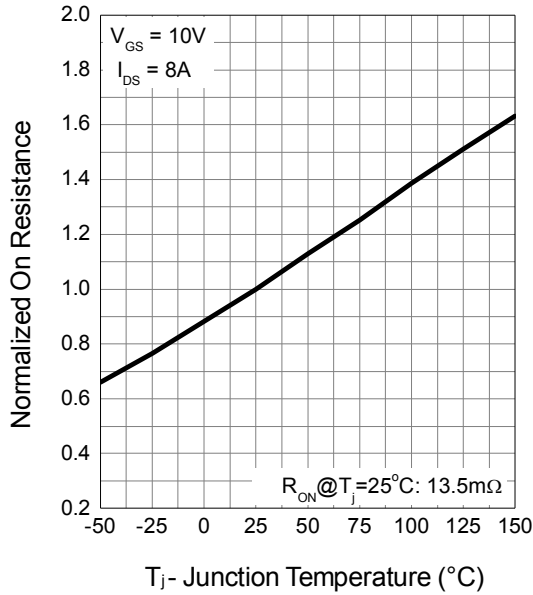


Gate Threshold Voltage

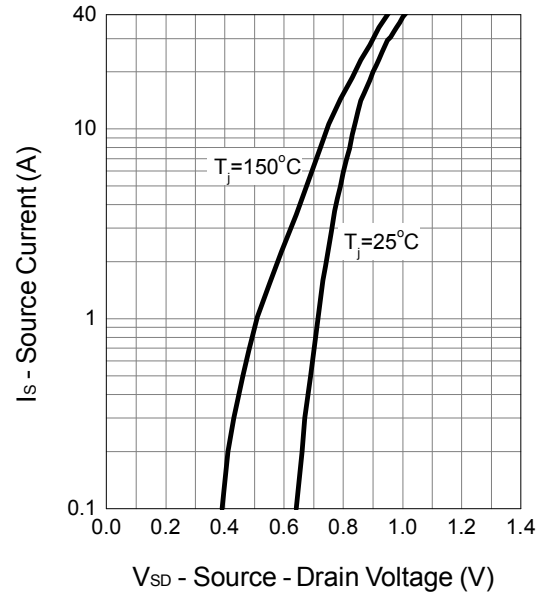


Typical Operating Characteristics (Cont.)

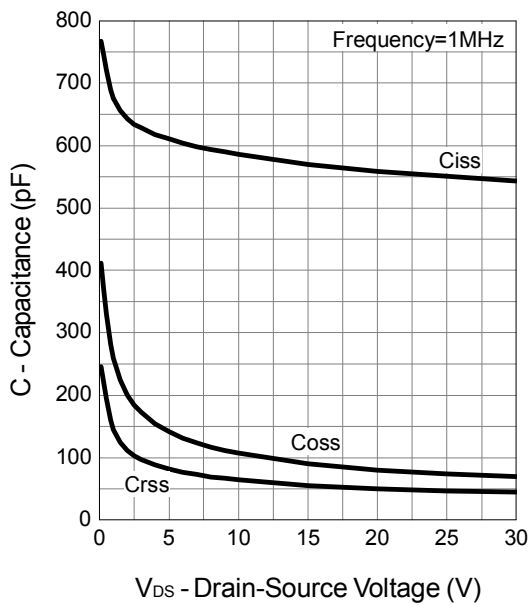
Drain-Source On Resistance



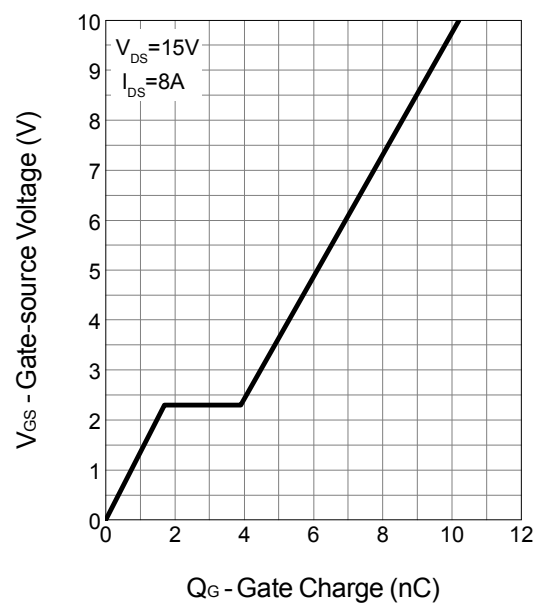
Source-Drain Diode Forward



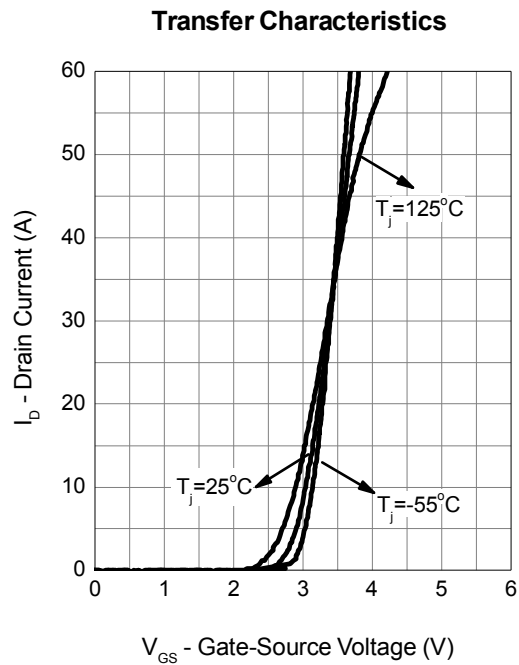
Capacitance



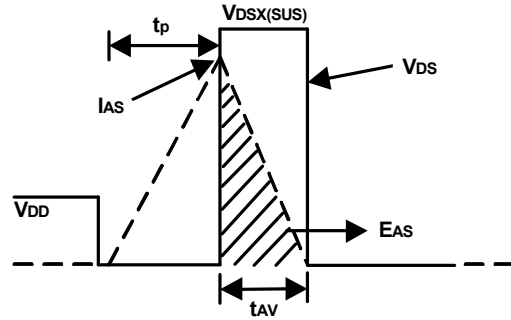
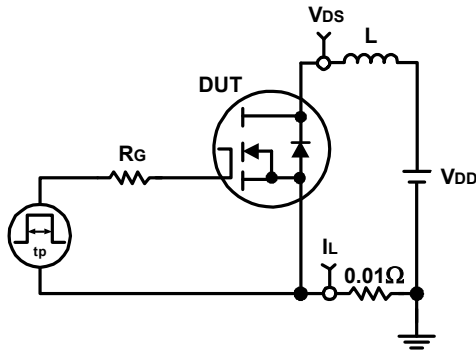
Gate Charge



Typical Operating Characteristics (Cont.)



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

