

N-Channel Enhancement Mode MOSFET

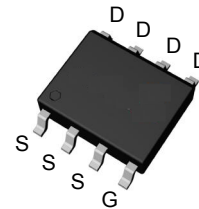
Features

- 30V/20A,
 $R_{DS(ON)} = 5.9m\Omega(\text{max.}) @ V_{GS} = 10V$
 $R_{DS(ON)} = 7.9m\Omega(\text{max.}) @ V_{GS} = 4.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

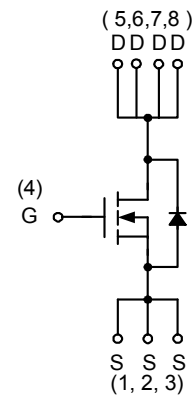
Applications

- 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 ($V_{GS}=10V$)	$T_A=25^\circ\text{C}$	20
		$T_A=70^\circ\text{C}$	15.8
I_{DM}^a	300 μs Pulsed Drain Current ($V_{GS}=10V$)	80	A
I_S^a	Diode Continuous Forward Current	5	
I_{AS}^b	Avalanche Current (Single Pulse)	25	
E_{AS}^b	Single Pulse Avalanche Energy ($L=0.1\text{mH}$)	31	mJ
T_J	Maximum Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	
P_D^a	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	4.2
		$T_A=70^\circ\text{C}$	2.6
$R_{\theta JA}^{a,c}$	Thermal Resistance-Junction to Ambient	$t \leq 10\text{s}$	30
		Steady State	65
$R_{\theta JL}$	Thermal Resistance-Junction to Lead	Steady State	20

Note a : Surface Mounted on 1in² pad area, $t \leq 10\text{sec}$.

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

Note c : Maximum under Steady State conditions is 75 $^\circ\text{C/W}$.

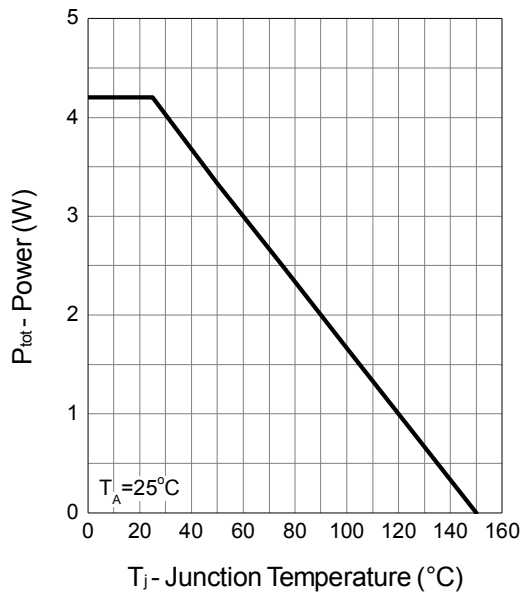
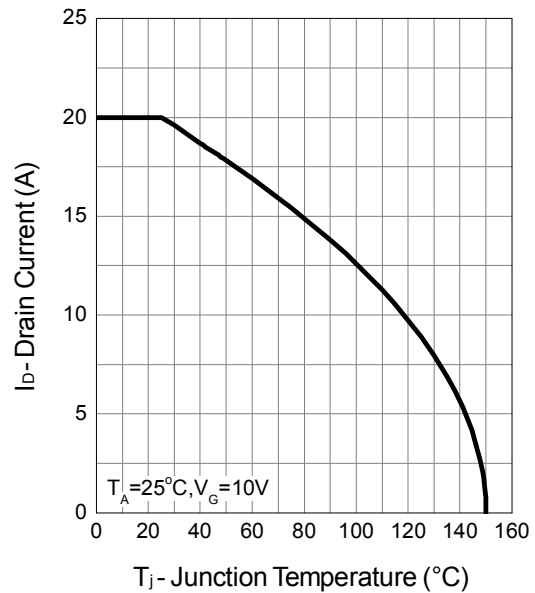
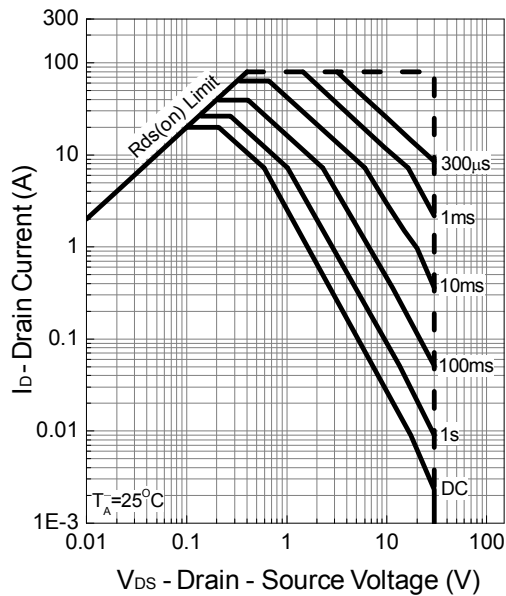
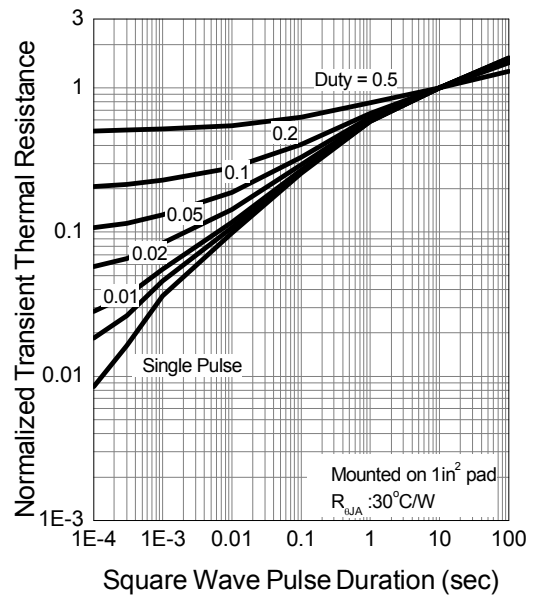
Electrical Characteristics ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=250\mu A$	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	1.8	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	$V_{GS}=10V, I_{DS}=20A$	-	4.5	5.9	m Ω
		$V_{GS}=4.5V, I_{DS}=14A$	-	6.1	7.9	
Diode Characteristics						
V_{SD}^a	Diode Forward Voltage	$I_{SD}=5A, V_{GS}=0V$	-	0.8	1.1	V
t_{rr}^b	Reverse Recovery Time	$I_{SD}=20A, dI_{SD}/dt=100A/\mu s$	-	10	-	ns
Q_{rr}^b	Reverse Recovery Charge		-	3	-	nC
Dynamic Characteristics^b						
R_G	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	2.4	-	Ω
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=15V, \text{Frequency}=1.0\text{MHz}$	-	1700	-	pF
C_{oss}	Output Capacitance		-	265	-	
C_{riss}	Reverse Transfer Capacitance		-	165	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=15V, R_L=15\Omega, I_{DS}=1A, V_{GEN}=10V, R_G=6\Omega$	-	14	26	ns
t_r	Turn-on Rise Time		-	10	19	
$t_{d(OFF)}$	Turn-off Delay Time		-	44	80	
t_f	Turn-off Fall Time		-	12	23	
Gate Charge Characteristics^b						
Q_g	Total Gate Charge	$V_{DS}=15V, V_{GS}=10V, I_{DS}=20A$	-	28.3	39.6	nC
	Total Gate Charge	$V_{DS}=15V, V_{GS}=4.5V, I_{DS}=20A$	-	12.9	-	
Q_{gs}	Gate-Source Charge	$V_{DS}=15V, V_{GS}=4.5V, I_{DS}=20A$	-	4.22	-	
Q_{gd}	Gate-Drain Charge	$V_{DS}=15V, V_{GS}=4.5V, I_{DS}=20A$	-	7.3	-	

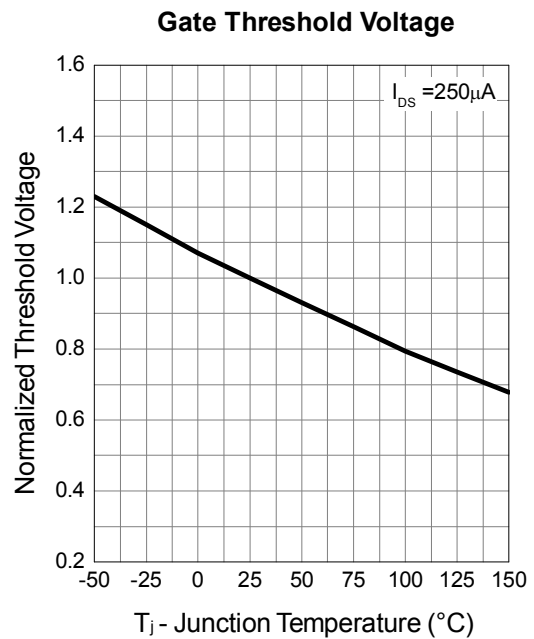
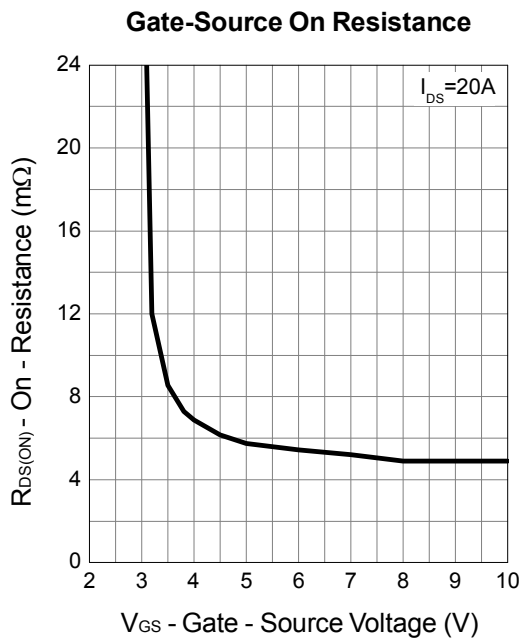
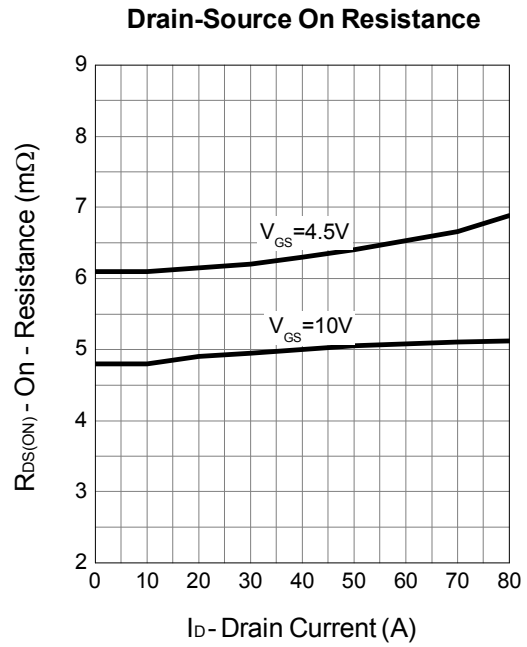
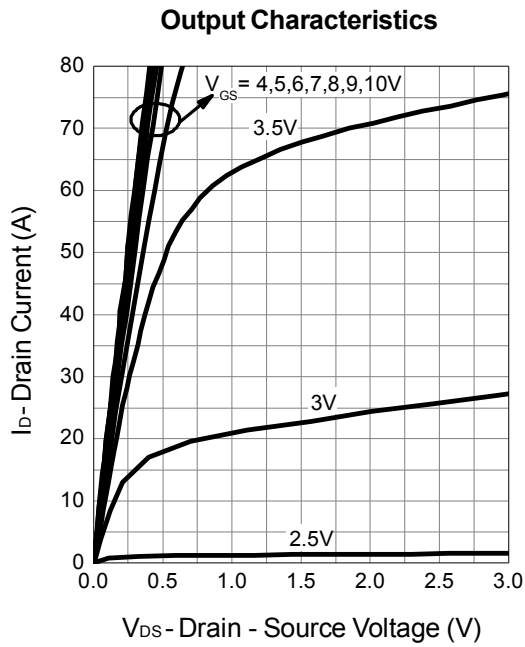
Note a : Pulse test ; pulse width $\leq 300 \mu s$, duty cycle $\leq 2\%$.

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

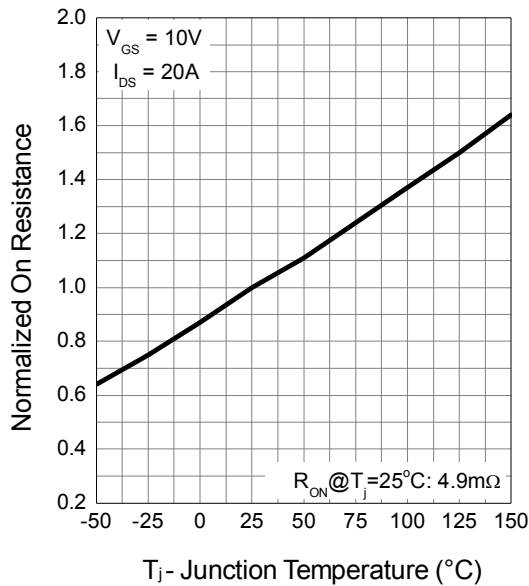
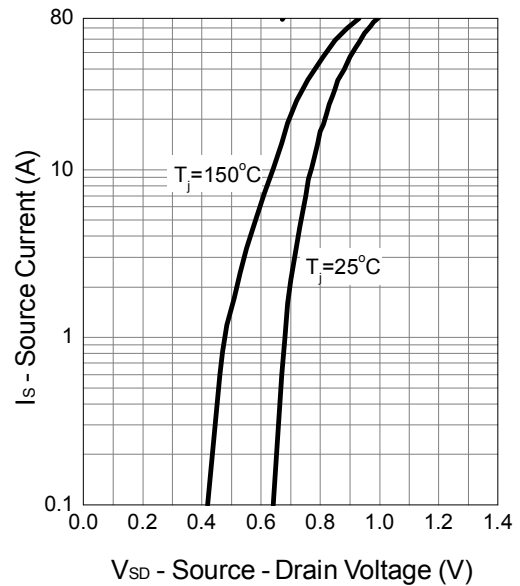
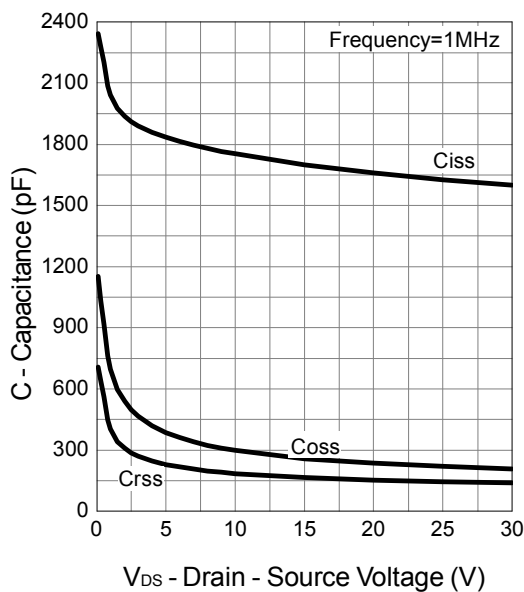
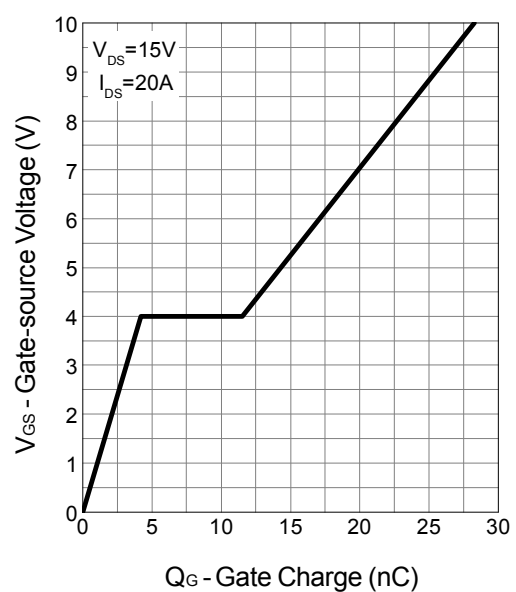
Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


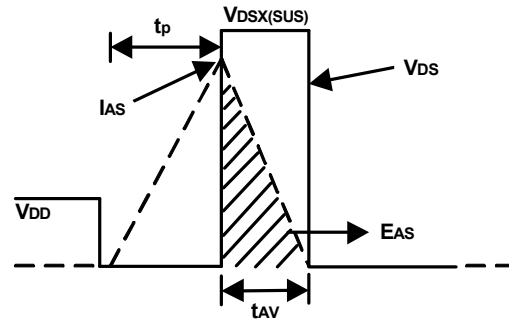
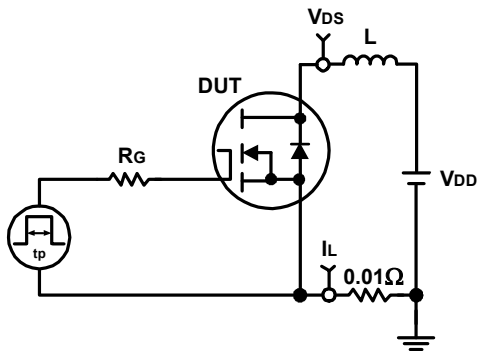
Typical Operating Characteristics (Cont.)



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

