

60V Dual N-Channel Power MOSFET

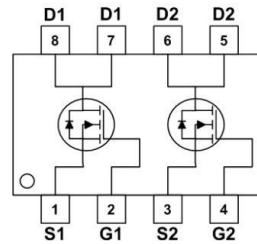
Features

- Originative New Design
- Advanced High Cell Density Trench Technology
- Robust Gate Oxide Technology
- Very Low Intrinsic Capacitances
- Excellent Switching Characteristics
- Extended Safe Operating Area

Applications

- Switching Mode Power Supply
- Motor Control
- DC/DC in Telecoms and Industrial

Pin Description



Absolute Ratings ($T_A = 25^\circ\text{C}$ in a SOP8 package unless otherwise noted)

Parameter	Symbol	N-Ch	Units
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Single Pulse UIS Capability, 0.1mH	E_{AS}	22	mJ
Continuous Drain Current, $T_C = 25^\circ\text{C}/70^\circ\text{C}$	I_D	4.0/3.2	A
Pulsed Drain Current	I_{DM}	16	A
Maximum Power Dissipation, $T_C = 25^\circ\text{C}$	P_D	1.5	W
Junction Temperature Maximum	T_{JMAX}	150	$^\circ\text{C}$
Storage Temperature	$T_{Storage}$	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Units
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	85	$^\circ\text{C}/\text{W}$

Electrical Characteristics

Static ($T_J=25^{\circ}\text{C}$ unless otherwise specified)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	60	---	---	V
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	---	---	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 48V, V_{GS} = 0V$	---	---	1	uA
		$V_{DS} = 48V, V_{GS} = 0V, T_J = 55^{\circ}\text{C}$	---	---	5	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 4A$	---	---	50	m Ω
		$V_{GS} = 4.5V, I_D = 3A$	---	---	60	
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	---	2.5	V
Dynamic ($T_J=25^{\circ}\text{C}$ unless otherwise specified)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 15V,$ $f = 1\text{MHz}$	---	1027	---	pF
Output Capacitance	C_{oss}		---	65	---	
Reverse Transfer Capacitance	C_{riss}		---	46	---	
Total Gate Charge	Q_g	$V_{DS} = 48V, I_D = 4A,$ $V_{GS} = 10V$	---	19	---	nC
Gate-Source Charge	Q_{gs}		---	2.6	---	
Gate-Drain Charge	Q_{gd}		---	4.1	---	
Turn-on delay time	$T_{d(on)}$	$V_{DS} = 30V, I_D = 4A,$ $V_{GS} = 10V, R_G=3.3\Omega$	---	3	---	nS
Rise time	T_r		---	34	---	
Turn-off delay time	$T_{d(off)}$		---	23	---	
Fall time	T_f		---	6	---	
Reverse Diode Characteristics						
Continuous Source Current	I_S	$V_{GS} = 0V, V_{DS} \text{Open}, f=1\text{MHz}$	---	---	2.5	A
Diode Forward Voltage	V_{SD}	$I_S = 1A, V_{GS} = 0V$	---	---	1.2	V

Typical Characteristics

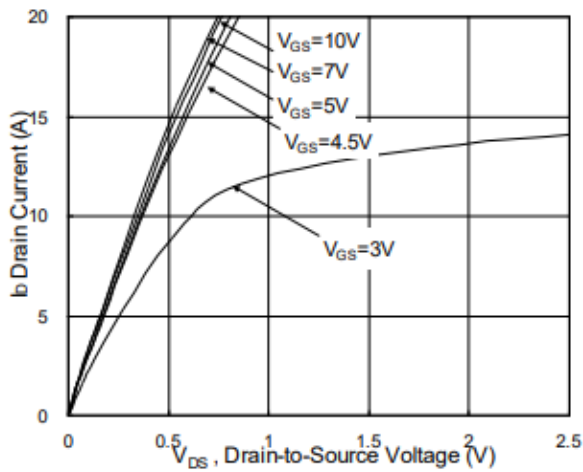


Fig.1 Typical Output Characteristics

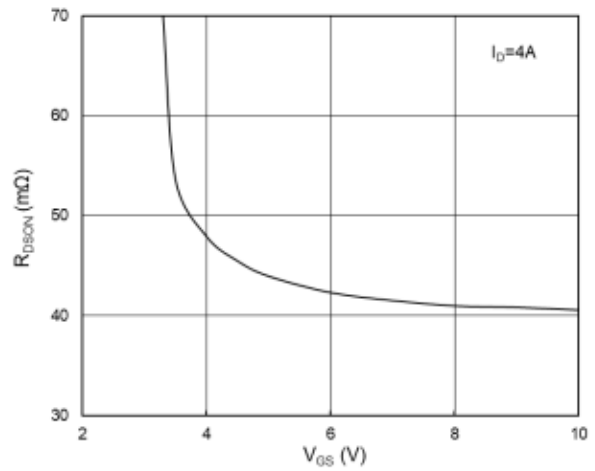


Fig.2 On-Resistance vs G-S Voltage

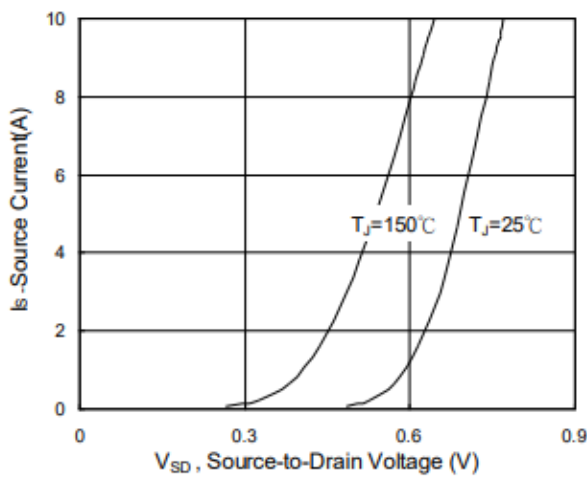


Fig.3 Source Drain Forward Characteristics

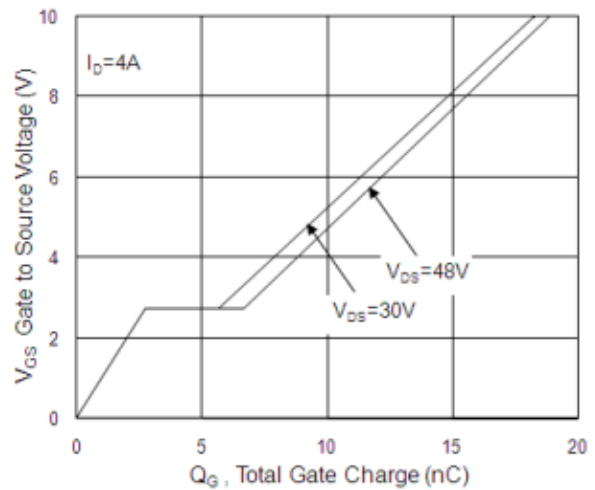


Fig.4 Gate-Charge Characteristics

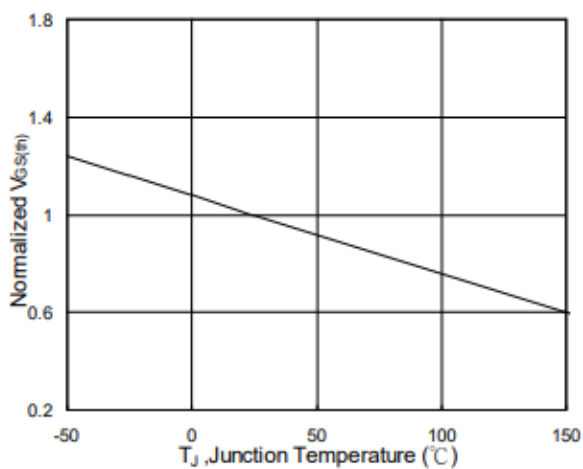


Fig.5 Normalized $V_{GS(th)}$ vs T_J

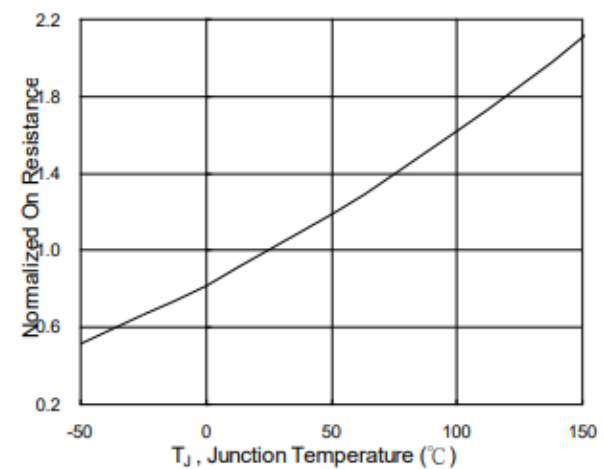


Fig.6 Normalized $R_{DS(on)}$ vs T_J

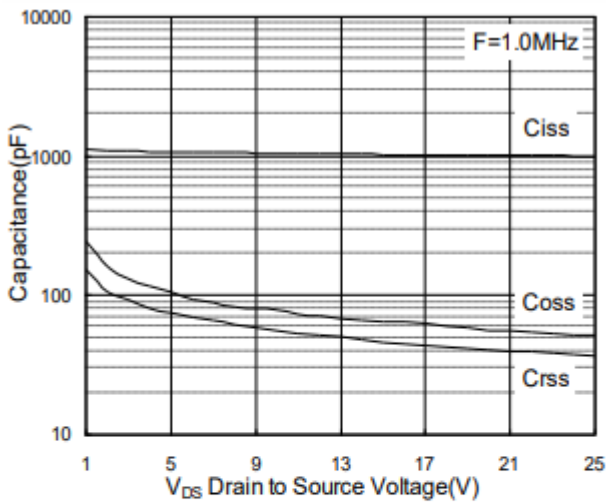


Fig.7 Capacitance

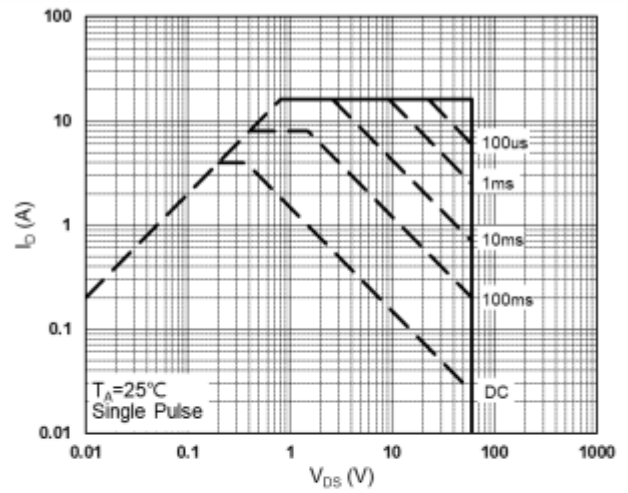


Fig.8 Safe Operating Area

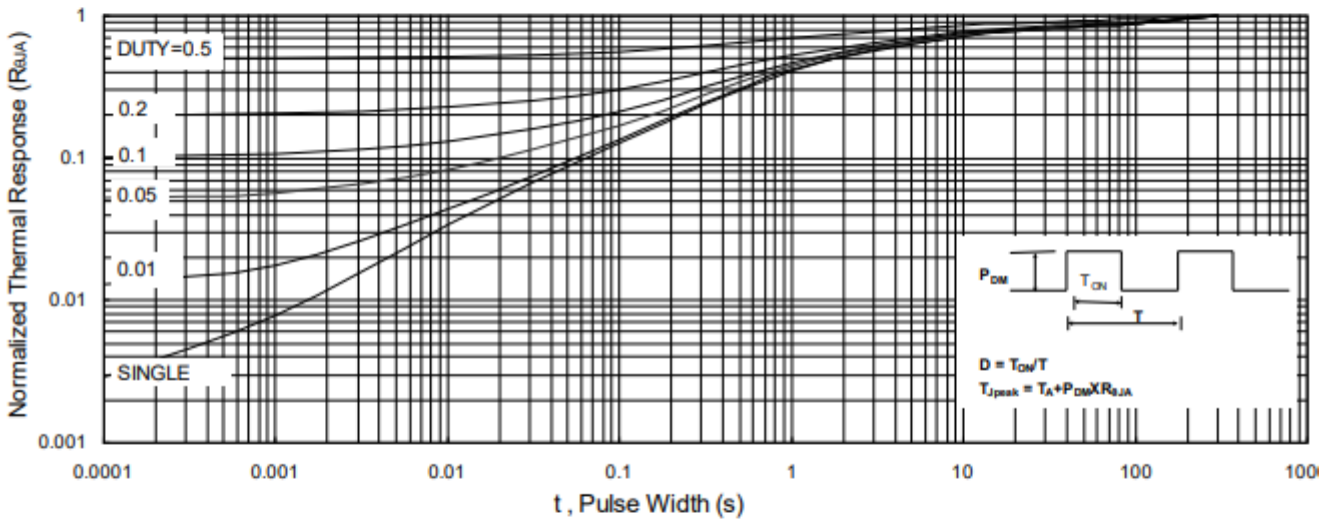


Fig.9 Normalized Maximum Transient Thermal Impedance

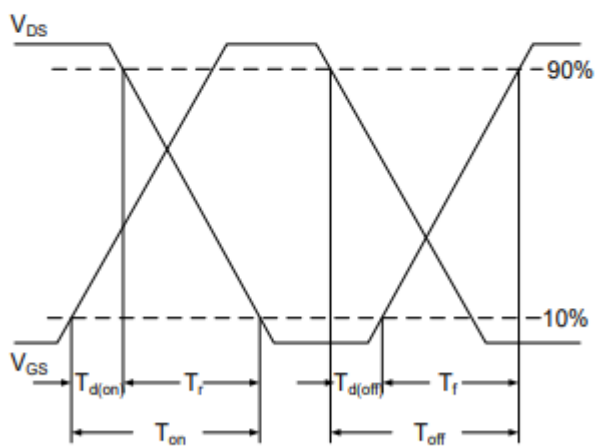


Fig.10 Switching Time Waveform

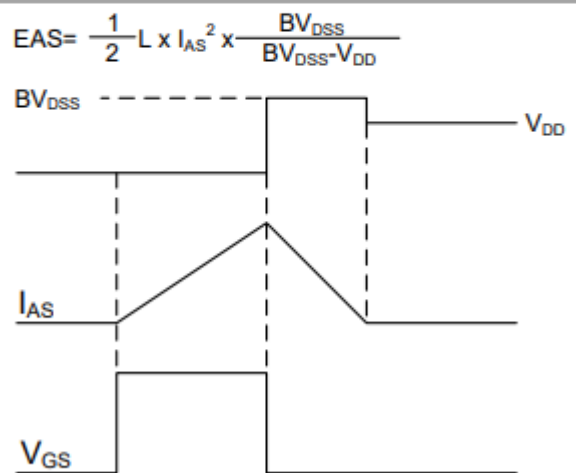
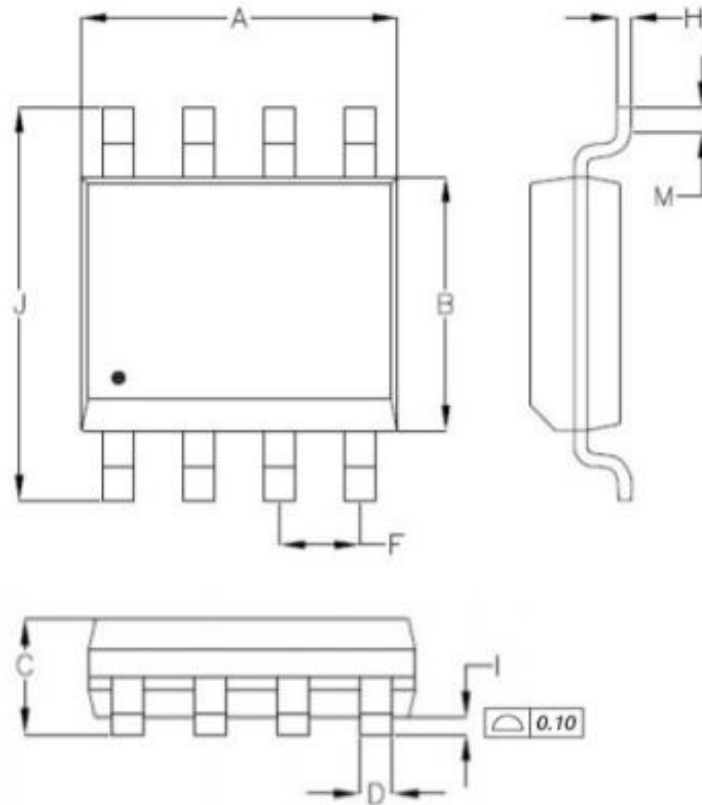


Fig.11 Unclamped Inductive Waveform

SOP8 Package Information



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.700	5.150	0.185	0.203
B	3.700	4.100	0.146	0.161
C	1.23	1.753	0.048	0.069
D	0.310	0.510	0.012	0.020
F	1.070	1.470	0.042	0.058
H	0.160	0.254	0.006	0.010
I	0.050	0.254	0.002	0.010
J	5.750	6.250	0.226	0.246
M	0.400	1.270	0.016	0.050