

600V Silicon N-channel Power MOSFET

Description

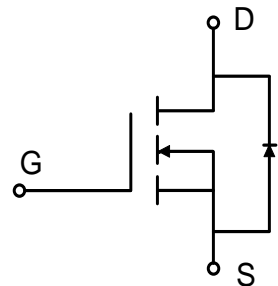
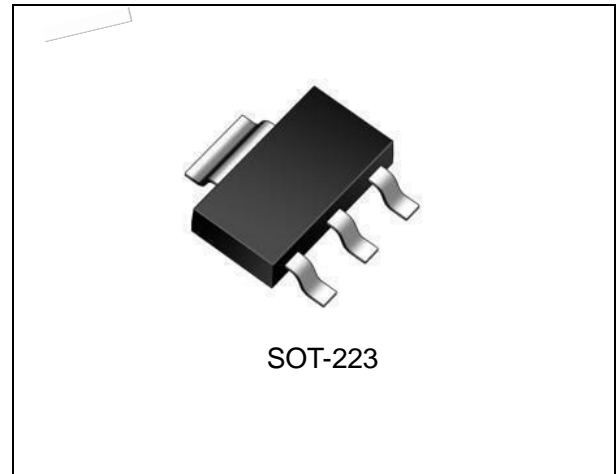
WMOSTM DM, the silicon N-channel enhanced VDMOSFETs, is obtained by the self-aligned planar technology which reduce the conduction loss, improve switching performance and enhance the avalanche energy. The transistor can be used in various power switching circuit for system miniaturization and higher efficiency.

Features

- Fast switching
- Typ. $R_{DS(on)} = 8.8\Omega$
- Low gate charge (Typ. $Q_g = 4.4C$)
- Typ. $C_{rss} = 3.3pF$
- 100% UIS tested

Applications

LED Lighting, Charger, Adapter, PC, LCD TV, Server



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DSS}	600	V
Continuous drain current ($T_C = 25^\circ C$)	I_D	0.4	A
Pulsed drain current ¹⁾	I_{DM}	1.6	A
Gate-source voltage	V_{GS}	± 30	V
Avalanche energy, single pulse ²⁾	E_{AS}	25	mJ
Power dissipation ($T_C = 25^\circ C$)	P_D	3.3	W
- Derate above $25^\circ C$		0.026	W/ $^\circ C$
Operating and storage temperature range	T_J, T_{STG}	-55 to +150	$^\circ C$
Continuous diode forward current	I_S	1	A
Diode pulse current	$I_{S,pulse}$	4	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-to-ambient	$R_{\theta JA}$	37.9	$^\circ C/W$

Electrical Characteristics $T_c = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static characteristics						
Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0\text{ V}, I_D=0.25\text{ mA}$	600	-	-	V
Gate threshold voltage	$V_{GS(th)}^{3)}$	$V_{DS}=V_{GS}, I_D=0.25\text{ mA}$	2	-	4	V
Drain cut-off current	I_{DSS}	$V_{DS}=600\text{ V}, V_{GS}=0\text{ V}$	-	-	1	μA
Gate leakage current, forward	I_{GSSF}	$V_{GS}=30\text{ V}, V_{DS}=0\text{ V}$	-	-	100	nA
Gate leakage current, reverse	I_{GSSR}	$V_{GS}=-30\text{ V}, V_{DS}=0\text{ V}$	-	-	-100	nA
Drain-source on-state resistance	$R_{DS(on)}^{3)}$	$V_{GS}=10\text{ V}, I_D=0.5\text{ A}$		8.8	10	Ω
Dynamic characteristics						
Input capacitance	C_{iss}	$V_{DS}=25\text{ V}, V_{GS}=0\text{ V},$ $f=1\text{ MHz}$	-	120	-	pF
Output capacitance	C_{oss}		-	15.5	-	
Reverse transfer capacitance	C_{rss}		-	3.3	-	
Turn-on delay time	$t_{d(on)}$	$V_{DD}=300\text{ V}, I_D=1\text{ A}$ $R_G=25\Omega$	-	4.5	-	ns
Rise time	t_r		-	21	-	
Turn-off delay time	$t_{d(off)}$		-	17	-	
Fall time	t_f		-	25	-	
Gate charge characteristics						
Gate to source charge	Q_{gs}	$V_{DD}=480\text{ V}, I_D=1\text{ A},$ $V_{GS}=0\text{ to }10\text{ V}$	-	0.8	-	nC
Gate to drain charge	Q_{gd}		-	1.7	-	
Gate charge total	Q_g		-	4.4	-	
Reverse diode characteristics						
Diode forward voltage	V_{SD}	$V_{GS}=0\text{ V}, I_F=1\text{ A}$	-	-	1.4	V
Reverse recovery time	t_{rr}	$V_R=50\text{ V}, I_F=1\text{ A}, dI_F/dt=100$ $\text{A}/\mu\text{s}$	-	753	-	ns
Reverse recovery charge	Q_{rr}		-	0.45	-	μC
Peak reverse recovery current	I_{rrm}		-	1.4	-	A

Notes:

1. Repetitive rating: pulse width limited by maximum junction temperature
2. $I_{AS}=1\text{ A}, V_{DD}=50\text{ V}, R_G=25\Omega$, starting $T_J = 25^\circ\text{C}$.
3. Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

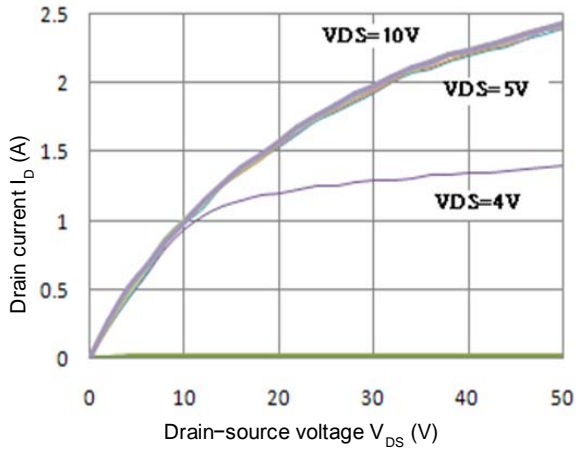


Figure 1. On-Region Characteristics

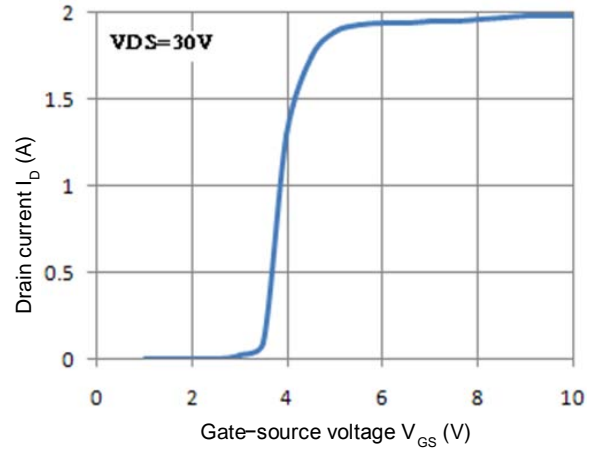


Figure 2. Transfer Characteristics

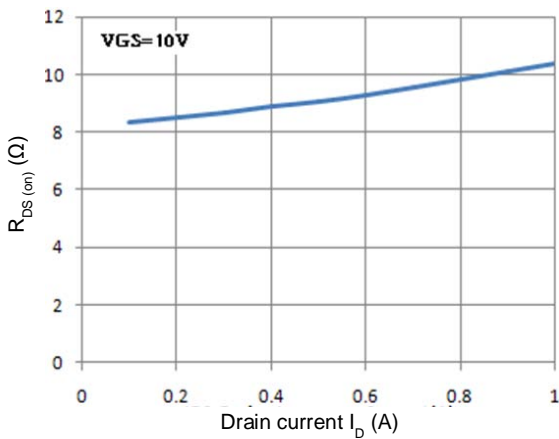


Figure 3. On-Resistance Variation vs. Drain Current

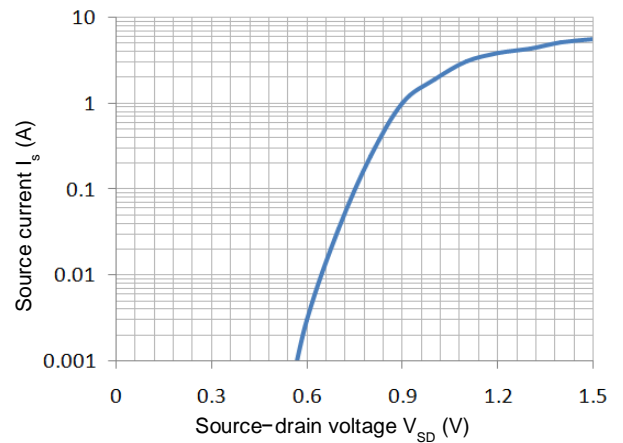


Figure 4. Source Current vs. Source-drain Voltage

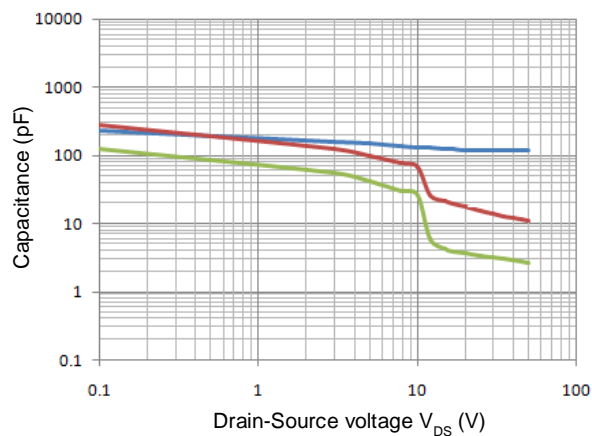
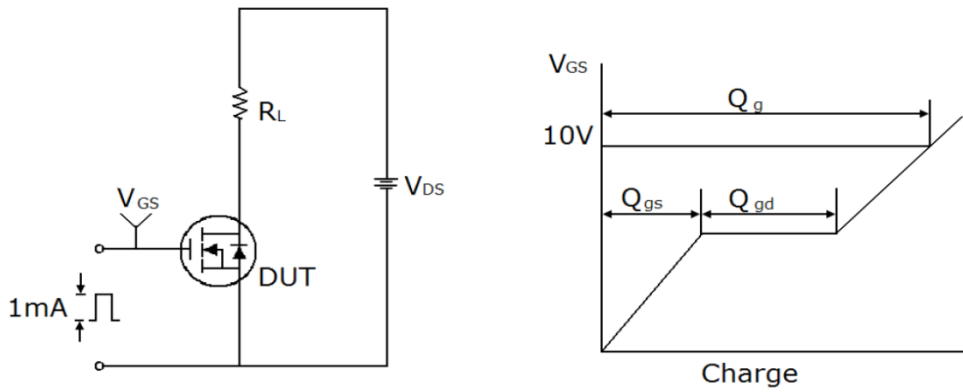
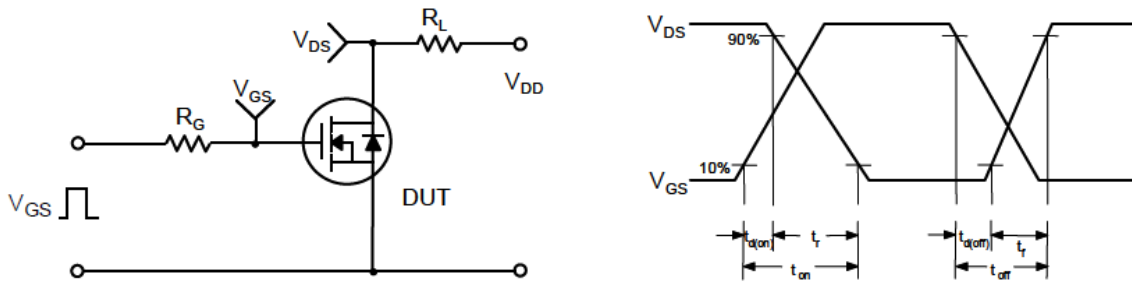


Figure 5. Capacitance Characteristics

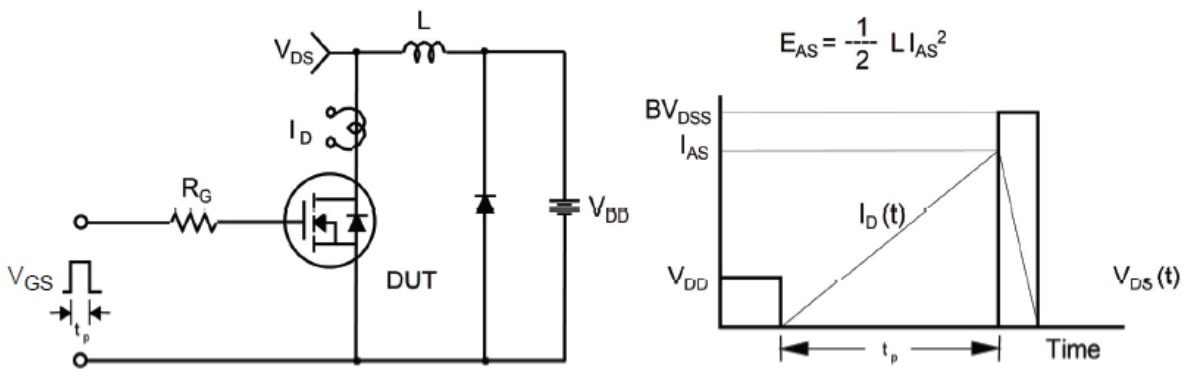
Gate Charge Test Circuit & Waveform

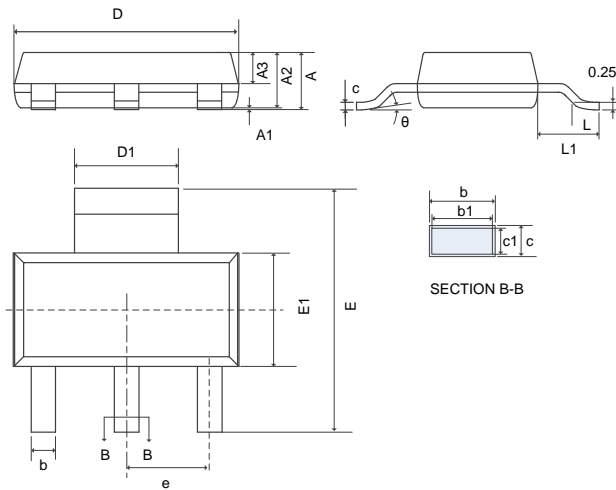


Switching Test Circuit & Waveforms



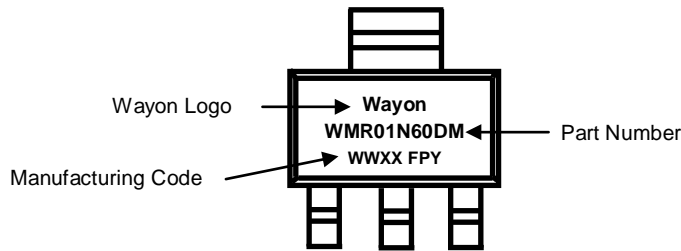
Unclamped Inductive Switching Test Circuit & Waveforms



Mechanical Dimensions for SOT-223

COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	1.5	1.65	1.8
A1	0.03	0.06	0.09
A2	1.5	1.6	1.7
A3	0.85	0.9	0.95
b	0.69	-	0.77
b1	0.68	0.71	0.74
c	0.3	-	0.34
c1	0.29	0.3	0.31
D	6.4	6.5	6.6
D1	3.00REF		
E	6.8	7	7.2
E1	3.4	3.5	3.6
e	2.30BSC		
L	0.9	-	1.15
L1	1.75REF		
θ	0	-	7

Marking Information



Contact Information

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