

N-Channel Enhancement Mode MOSFET

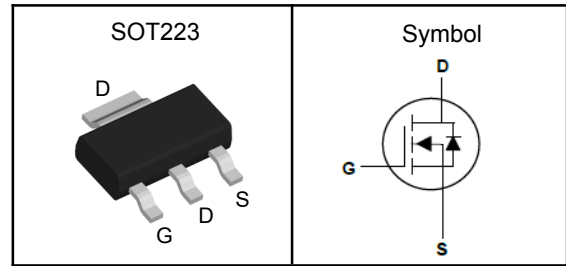
Features

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant
- 100% UIS and Rg Tested

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



V _{DSS}	60	V
R _{DS(ON)-Typ}	80	mΩ
I _D	2.8	A

Absolute Maximum Ratings (T_A=25°C, Unless Otherwise Noted)

Symbol	Parameter	N-Channel	Unit
V _{DSS}	Drain-Source Voltage	60	V
V _{GSS}	Gate-Source Voltage	±20	V
T _J	Maximum Junction Temperature	-55 to 150	°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
I _{DM} ^①	Pulse Drain Current Tested	12	A
I _D	Continuous Drain Current	2.8	A
		T _A =25°C	
P _D	Maximum Power Dissipation	1.5	W
		T _A =25°C	

Thermal Characteristics

Symbol	Parameter	Rating	Unit
R _{θJA}	Thermal Resistance Junction-Ambient ₁ (Max)	85	°C/W
R _{θJC}	Thermal Resistance Junction-Case ₁	48	°C/W

Note ① : Max. current is limited by bonding wire.

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150°C.

Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.



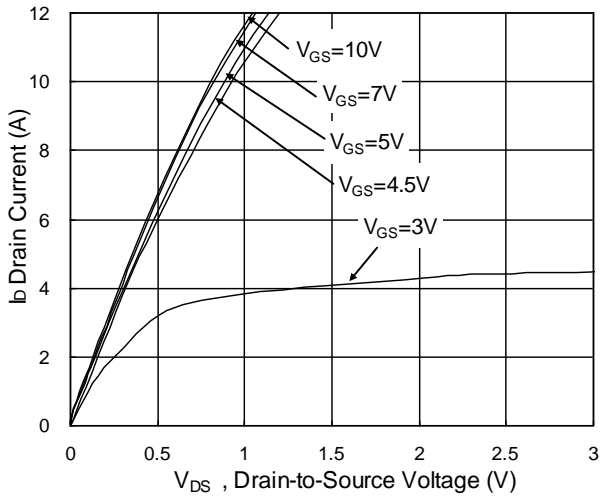
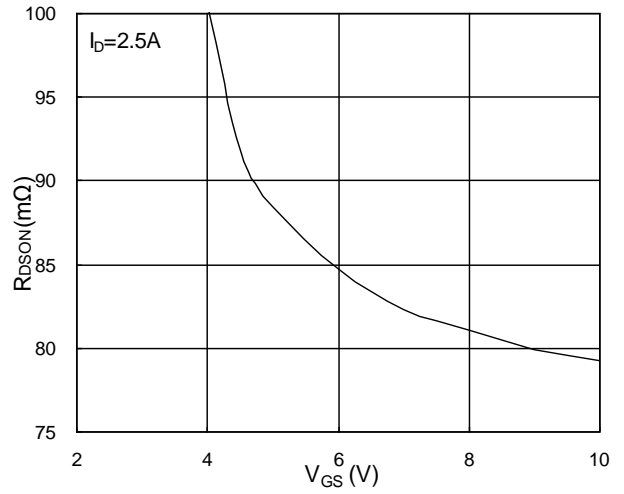
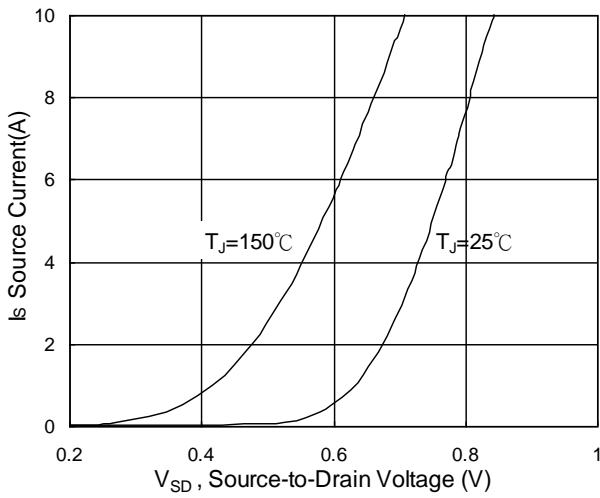
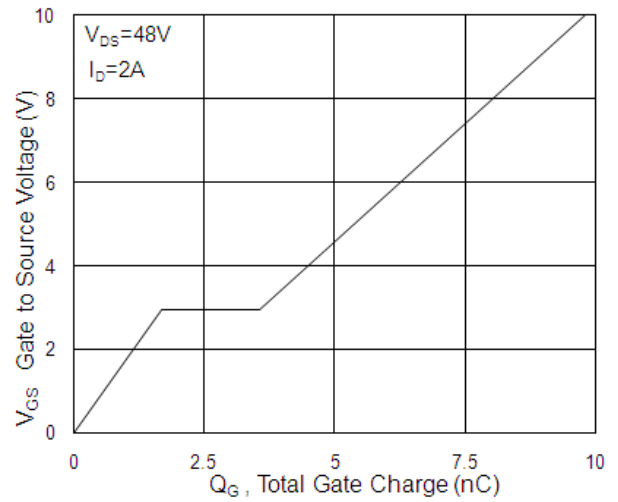
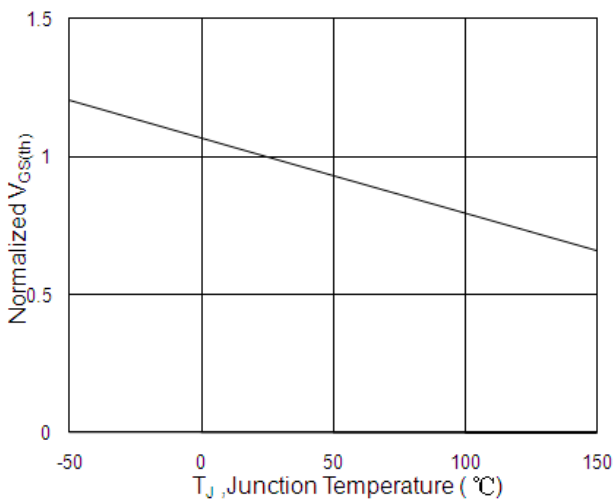
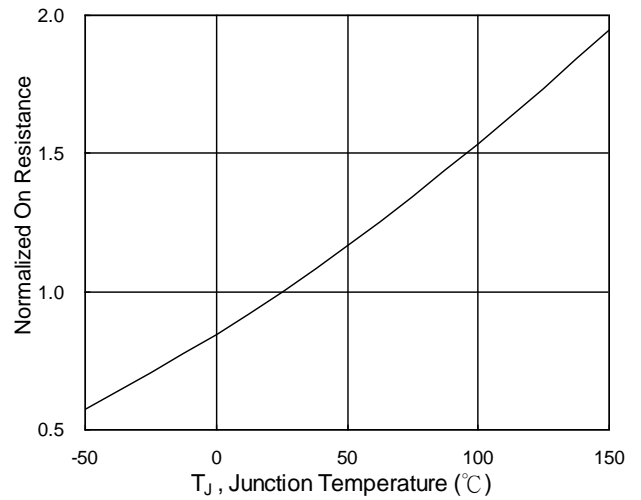
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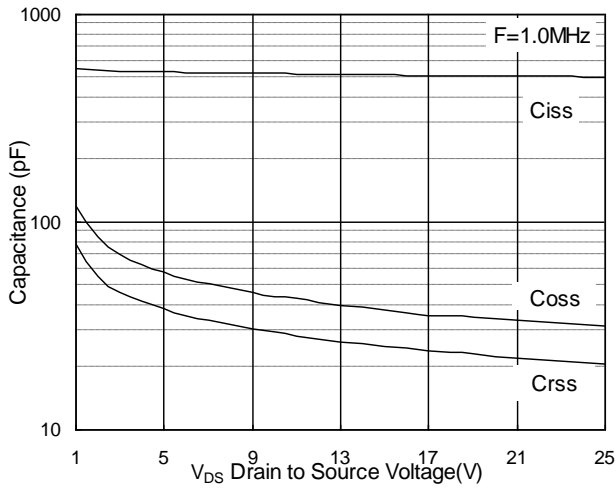
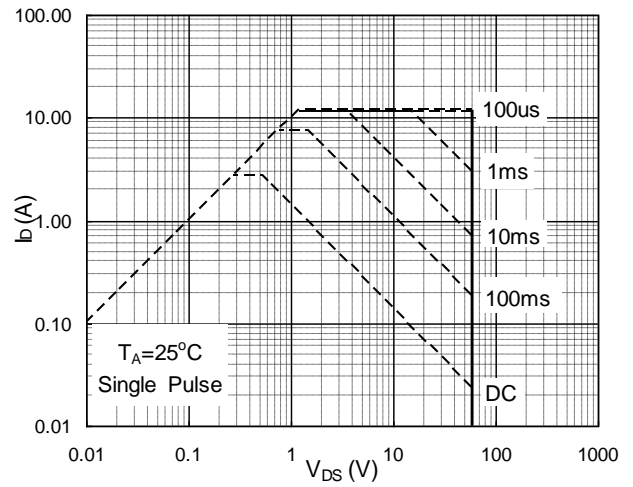
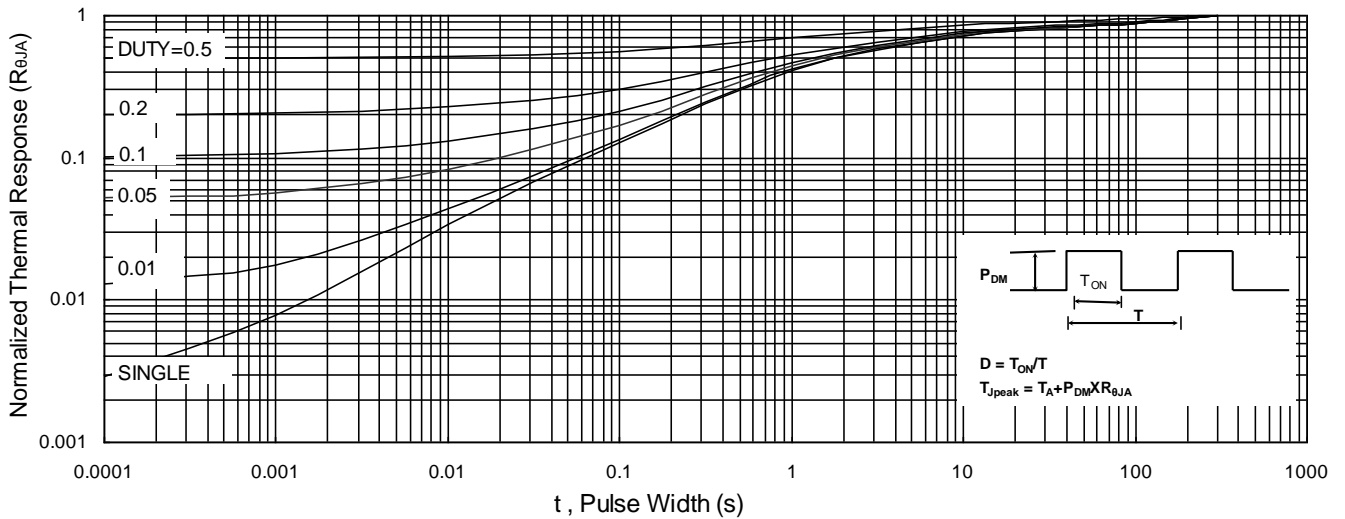
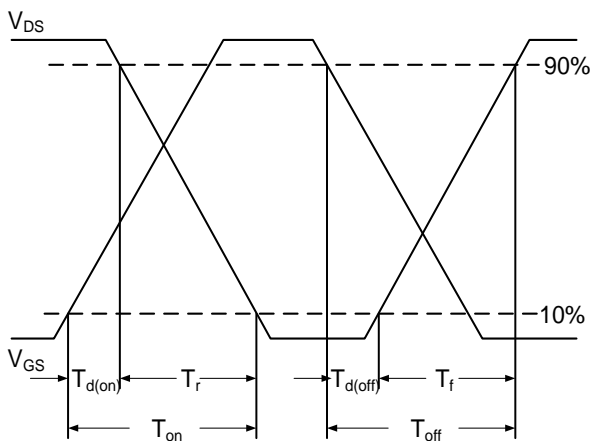
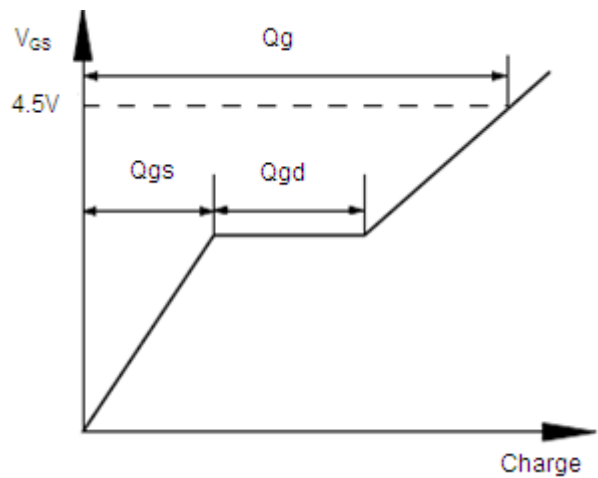
Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

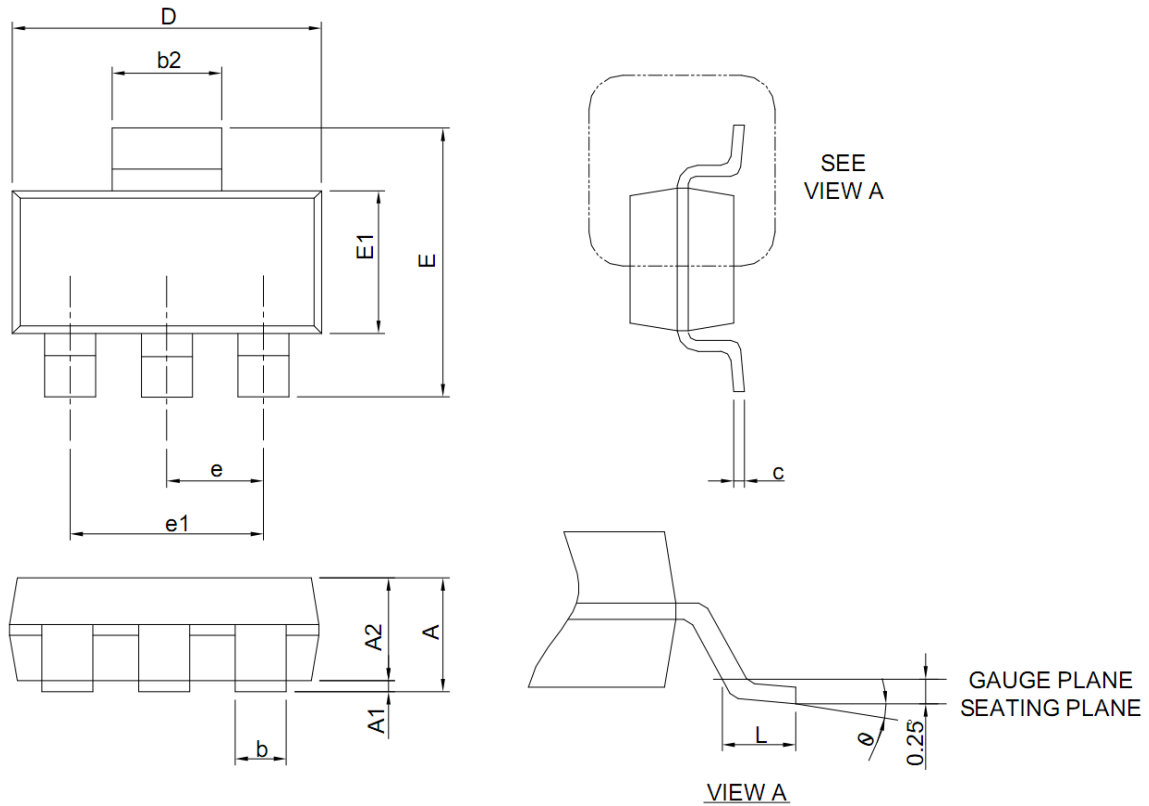
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=48V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	---	2.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=2.5A$	---	80	100	m Ω
		$V_{GS}=4.5V, I_D=2A$	---	85	110	
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=15V, \text{Freq.}=1\text{MHz}$	---	511	---	pF
C_{oss}	Output Capacitance		---	38	---	
C_{rss}	Reverse Transfer Capacitance		---	25	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=30V, V_{GS}=10V, R_G=3.3\Omega, I_D=2A$	---	1.6	---	nS
T_r	Turn-on Rise Time		---	7.2	---	
$T_{d(off)}$	Turn-off Delay Time		---	25	---	
T_f	Turn-off Fall Time		---	14.4	---	
Q_g	Total Gate Charge	$V_{DS}=48V, V_{GS}=4.5V, I_D=2A$	---	5	---	nC
Q_{gs}	Gate-Source Charge		---	1.68	---	
Q_{gd}	Gate-Drain Charge		---	1.9	---	
Source-Drain Characteristics ($T_J=25^{\circ}\text{C}$)						
V_{SD}	Diode Forward Voltage _z	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	---	---	1.2	V
t_{rr}	Reverse Recovery Time	$I_F=2A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	9.7	---	nS
Q_{rr}	Reverse Recovery Charge		---	5.8	---	nC

Note ④ : Pulse test (pulse width \leq 300 μs , duty cycle \leq 2%).

Note ⑤ : Guaranteed by design, not subject to production testing.

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Typical Characteristics

Fig.1 Typical Output Characteristics

Fig.2 On-Resistance v.s Gate-Source

Fig.3 Forward Characteristics of Reverse

Fig.4 Gate-Charge Characteristics

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

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

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Fig.7 Capacitance

Fig.8 Safe Operating Area

Fig.9 Normalized Maximum Transient Thermal Impedance

Fig.10 Switching Time Waveform

Fig.11 Gate Charge Waveform

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SOT223 Package Outline Data


Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	1.50	1.65	1.80	A1	0.02	0.06	0.10
A2	1.50	1.60	1.70	b	0.66	0.72	0.80
b2	2.90	3.00	3.10	c	0.23	0.30	0.35
D	6.30	6.50	6.70	E	6.70	7.00	7.30
E1	3.30	3.50	3.70	e	2.30 REF		
e1	4.60 REF			L	0.75	--	1.15
θ	0°	--	10°				