P-Channel Enhancement Mode MOSFET

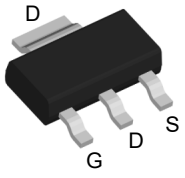
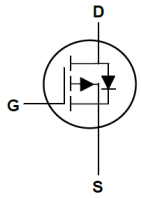
Features

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

Applications

- Motor drivers
- DC - DC Converter

Pin Description

SOT223	Symbol
	

V_{DSS}	-60	V
$R_{DS(ON)-Typ}$	85	mΩ
I_D	-3.8	A

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

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		-60	V
V_{GSS}	Gate-Source Voltage		±20	V
T_J	Maximum Junction Temperature		-55 to 150	℃
T_{STG}	Storage Temperature Range		-55 to 150	℃
I_{DM} ①	Pulse Drain Current Tested		-16	A
I_D	Continuous Drain Current	T_A=25°C	-3.8	A
I_D	Continuous Drain Current	T_A=100°C	-2.4	A
P_D	Maximum Power Dissipation	T_A=25°C	2.7	W
E_{AS}	Avalanche Energy, Single pulse		9.8	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	46.3	℃/W

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

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

Note ③: Surface Mounted on 1in^2 FR-4 board with 1oz.

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Electrical Characteristics (T_J=25℃, 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=-250uA	-60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-60V, V_{GS}=0V	---	---	-1	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=-250uA	-1.0	---	-2.5	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	---	---	±100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=-10V, I_D=-2A	---	85	115	mΩ
		V_{GS}=-4.5V, I_D=-1A	---	95	135	mΩ
Dynamic Characteristics⑤						
R_g	Gate Resistance	f=1MHz	---	11	---	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-30V, Freq.=1MHz	---	998	---	pF
C_{oss}	Output Capacitance		---	59	---	
C_{rss}	Reverse Transfer Capacitance		---	38	---	
$T_{d(on)}$	Turn-on Delay Time	V_{GS}=-10V,V_{DS}=-30V , I_D=-2A,R_G=3Ω	---	28	---	nS
T_r	Turn-on Rise Time		---	66	---	
$T_{d(off)}$	Turn-off Delay Time		---	9.8	---	
T_f	Turn-off Fall Time		---	6.5	---	
Q_g	Total Gate Charge	V_{GS}=-10V,V_{DS}=-30V , I_D=-2A	---	30	---	nC
Q_{gs}	Gate-Source Charge		---	4.7	---	
Q_{gd}	Gate-Drain Charge		---	3.8	---	
	Source-Drain Characteristics					
V_{SD}④	Diode Forward Voltage	I_S=-2A, V_{GS}=0V	---	---	-1.2	V
I_S	Maximum Continuous Drain-Source Diode Forward Current		---	---	-3.8	A

Note ④: Pulse test (pulse width≤300us, duty cycle≤2%).

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

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Typical Characteristics

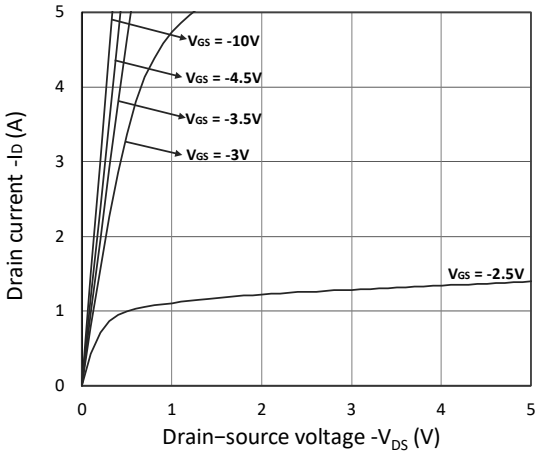

Figure 1. Output Characteristics

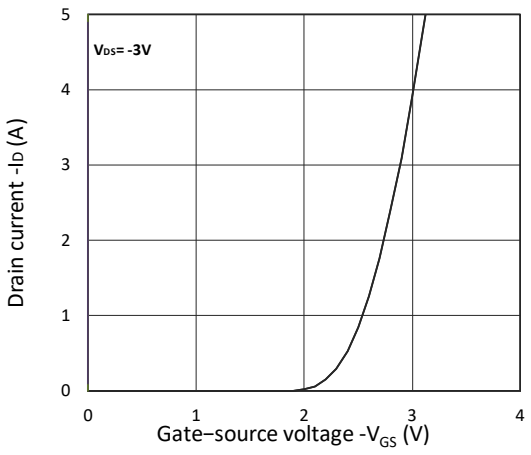

Figure 2. Transfer Characteristics

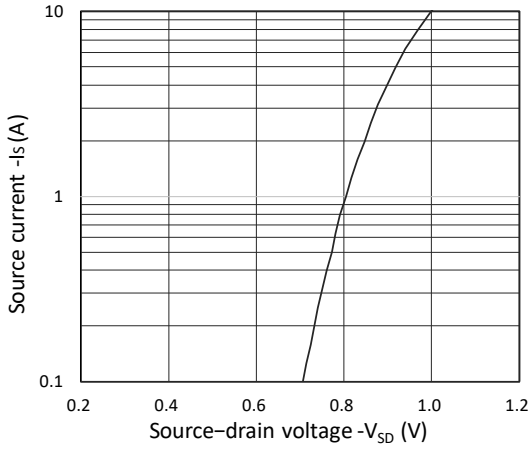

Figure 3. Forward Characteristics of Reverse

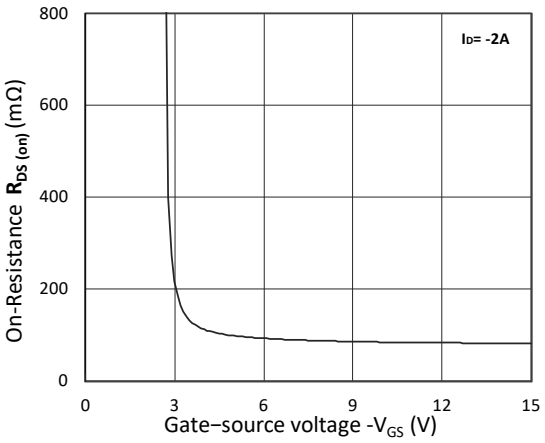

Figure 4. $R_{DS(ON)}$ vs. V_{GS}

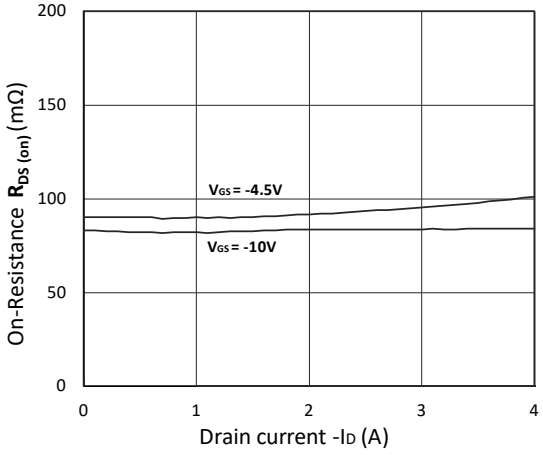

Figure 5. $R_{DS(ON)}$ vs. I_D

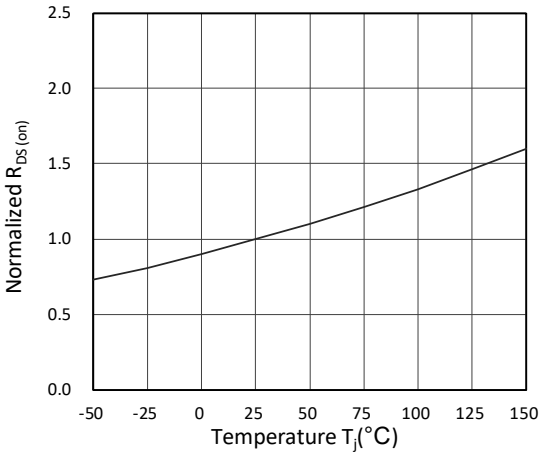

Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

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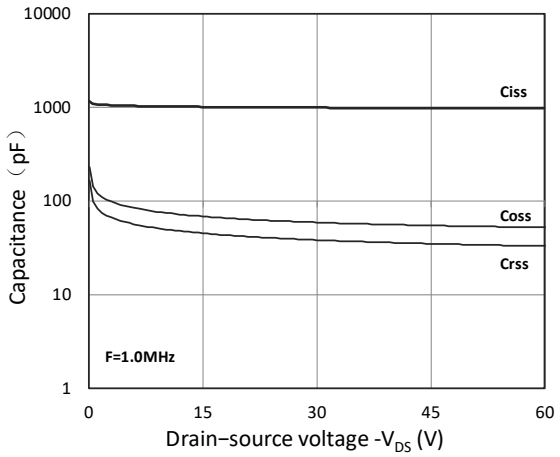

Figure 7. Capacitance Characteristics

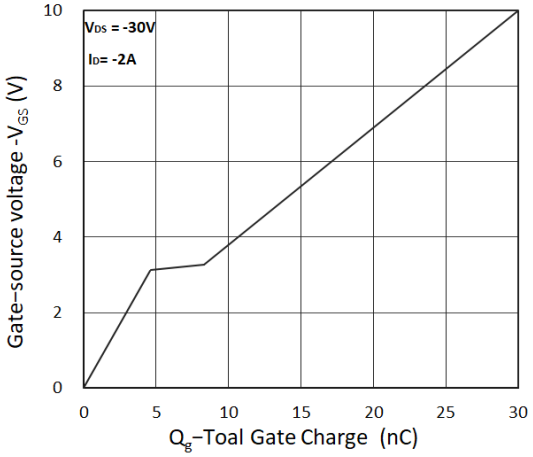

Figure 8. Gate Charge Characteristics

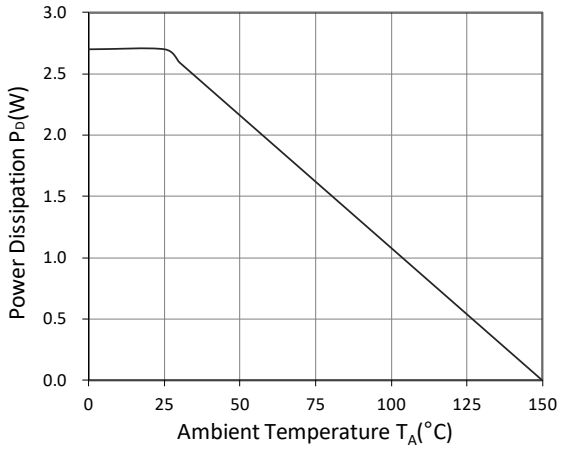

Figure 9. Power Dissipation

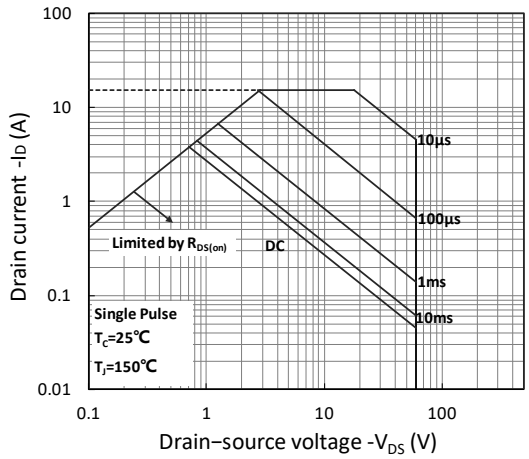

Figure10. Safe Operating Area

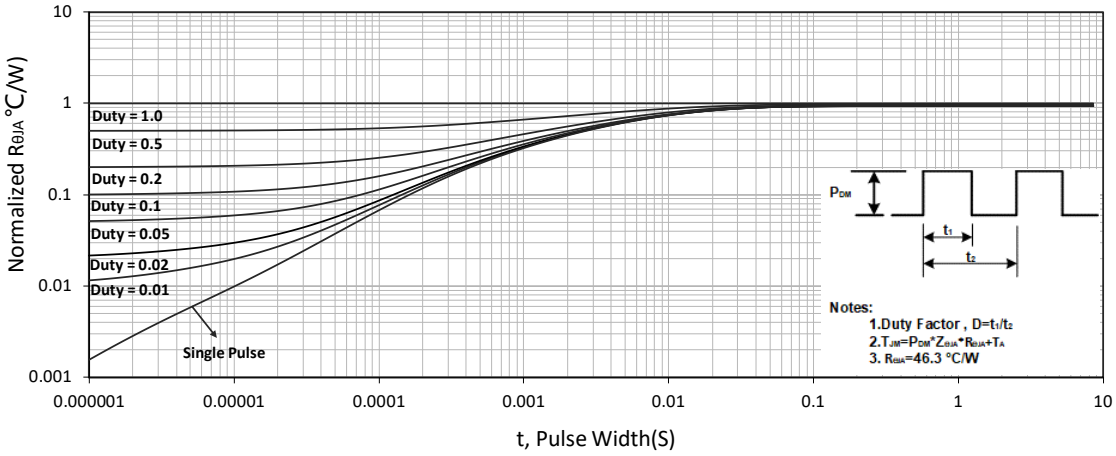

Figure 11. Normalized Maximum Transient Thermal Impedance

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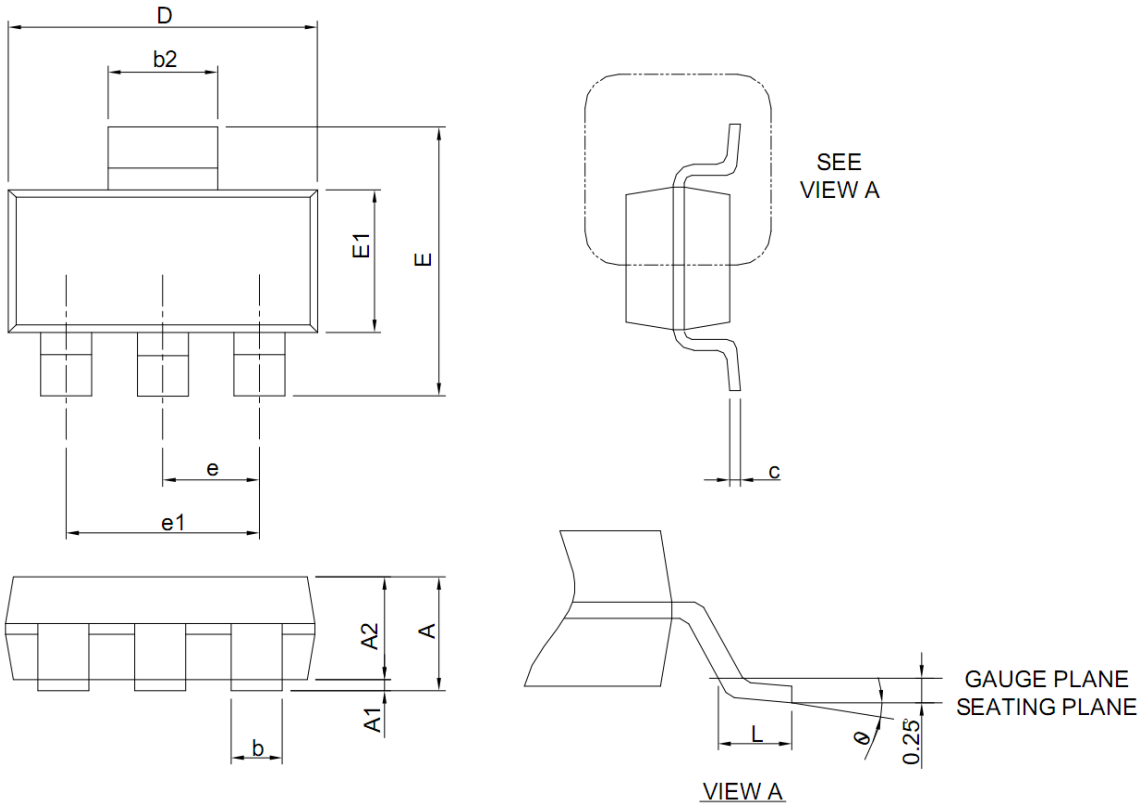
SOT223 Package Outline Data



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°				