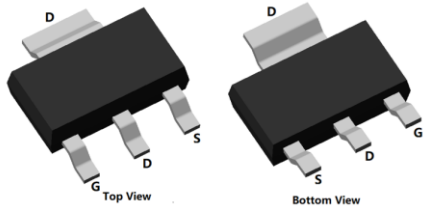
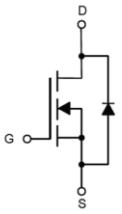
N-Channel Enhancement Mode Field Effect Transistor



SOT-223



Product Summary

- V_{DS} 150V
- I_D 2.20A
- $R_{DS(ON)}$(at V_{GS}=10V) ＜165mΩ

General Description

- Extremely low switching loss
- Excellent stability and uniformity
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- TV Backlight

■ Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit
Drain-source Voltage			V_{DS}	-	150	V
Gate-source Voltage			V_{GS}	-20	20	
Continuous Drain Current (Note 1,2)	Steady-State	T_A=25℃,V_{GS}=10V	I_D	-	2.2	A
		T_A=100℃,V_{GS}=10V		-	1.4	
Pulsed Drain Current	T_A=25℃,t_p≤10μs		I_{DM}	-	17.6	
Maximum Body-Diode Continuous Current	T_A=25℃		I_S		1.5	
Total Power Dissipation (Note 1,2)	Steady-State	T_A=25℃	P_D	-	1.78	W
		T_A=100℃		-	0.71	
Junction and Storage Temperature Range			T_J ,T_{STG}	-55	150	℃

■Thermal Resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient (Note 2)	Steady-State	$R_{\theta JA}$	-	70	℃/W

■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
M165G15A	F2	M165G15A	2500	5000	25000	13” reel

■ Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V,I_D=250μA,Tj=25℃	150	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=150V,V_{GS}=0V,Tj=25℃	-	-	1	μA
		V_{DS}=150V,V_{GS}=0V,Tj=150℃	-	-	100	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V,Tj=25℃	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA,Tj=25℃	1.5	2	2.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V,I_D=2A,Tj=25℃	-	125	165	mΩ
Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V,Tj=25℃	-	0.78	1.2	V
Gate Resistance	R_G	f=1MHz,Tj=25℃	-	1.6	-	Ω
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{DS}=75V,V_{GS}=0V,f=1MHz,Tj=25℃	-	224	-	pF
Output Capacitance	C_{oss}		-	25	-	
Reverse Transfer Capacitance	C_{rss}		-	1.9	-	
Switching Parameters						
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=75V,I_D=2A,Tj=25℃	-	4.5	-	nC
Gate-Source Charge	Q_{gs}		-	0.83	-	
Gate-Drain Charge	Q_{gd}		-	1.7	-	
Reverse Recovery Charge	Q_{rr}	I_F=2A,di/dt=100A/μs,V_{GS}=0V,V_R=75V, Tj=25℃	-	41.3	-	nC
Reverse Recovery Time	t_{rr}		-	38.4	-	ns
Turn-on Delay Time	$t_{D(on)}$	V_{GS}=10V,V_{DS}=75V,I_D=2A,R_{GEN}=3Ω, Tj=25℃	-	3.3	-	ns
Turn-on Rise Time	t_r		-	2.5	-	
Turn-off Delay Time	$t_{D(off)}$		-	8.7	-	
Turn-off Fall Time	t_f		-	5.2	-	

Note：

1. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
2. The value of $R_{\theta JA}$ is measured with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in^2 pad of 2oz. Copper, in the still air environment with T_A=25℃.The maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

■Typical Electrical and Thermal Characteristics Diagrams

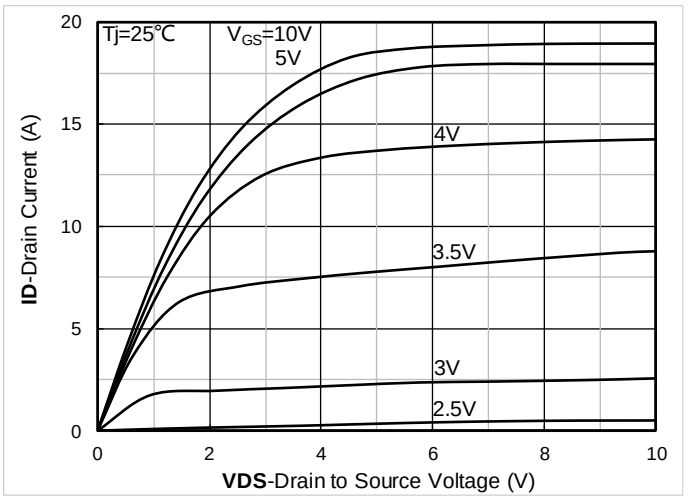


Figure 1. Output Characteristics; typical values

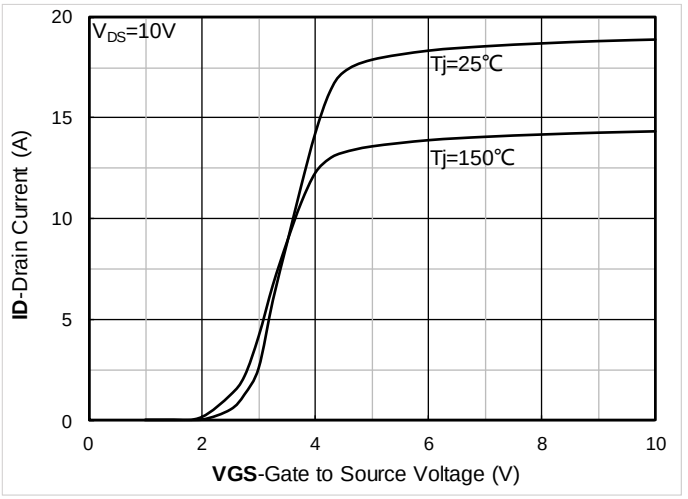


Figure 2. Transfer Characteristics; typical values

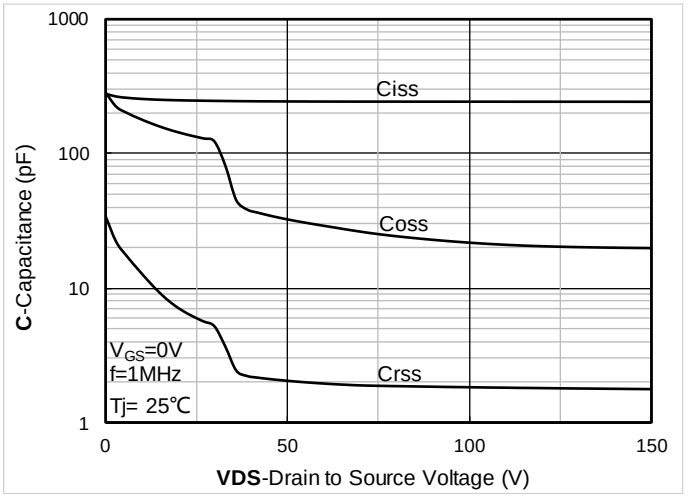


Figure 3. Capacitance Characteristics; typical values

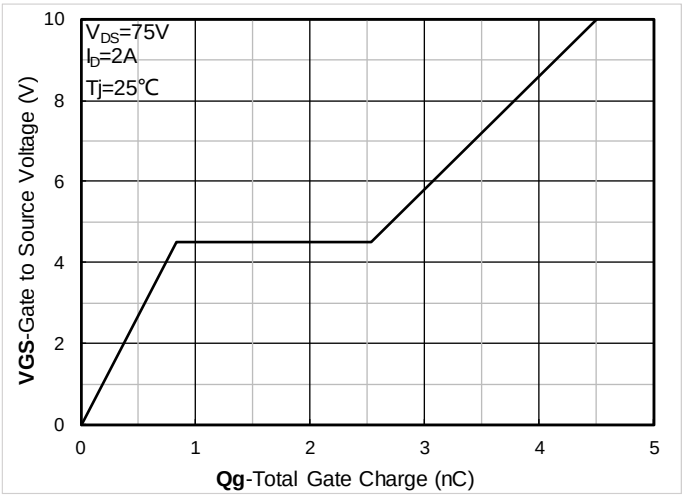


Figure 4. Gate Charge; typical values

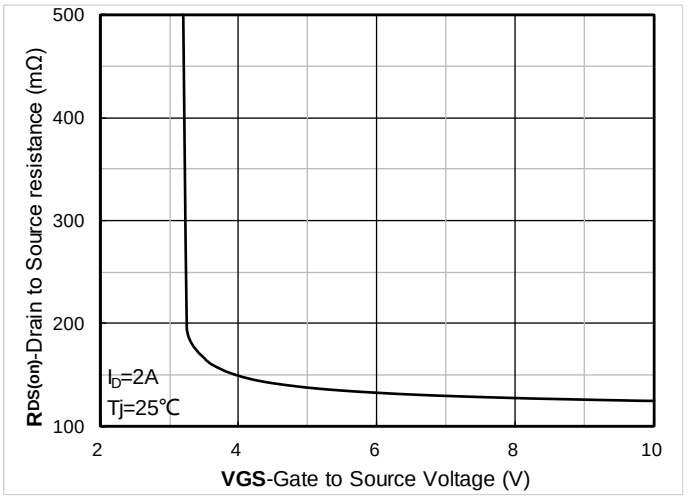


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

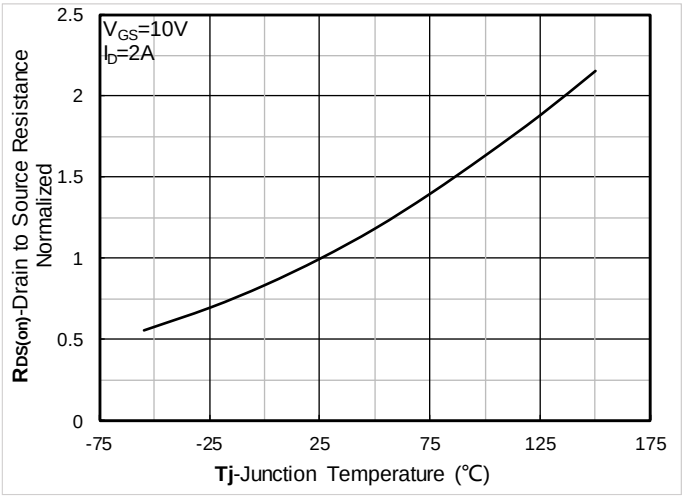


Figure 6. Normalized On-Resistance

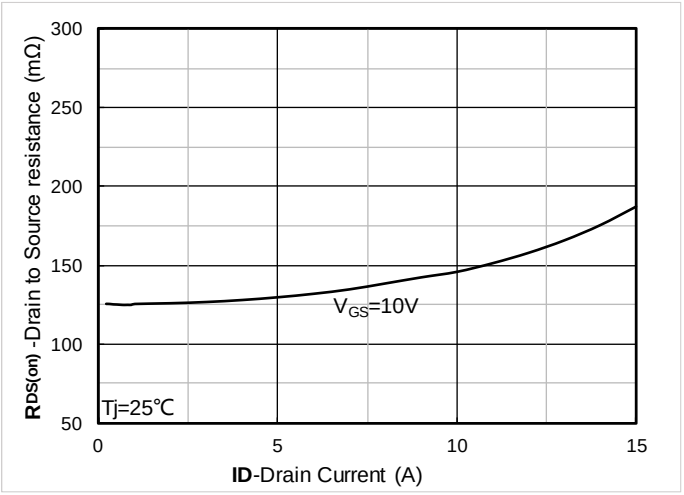


Figure 7. $R_{DS(on)}$ vs. Drain Current; typical values

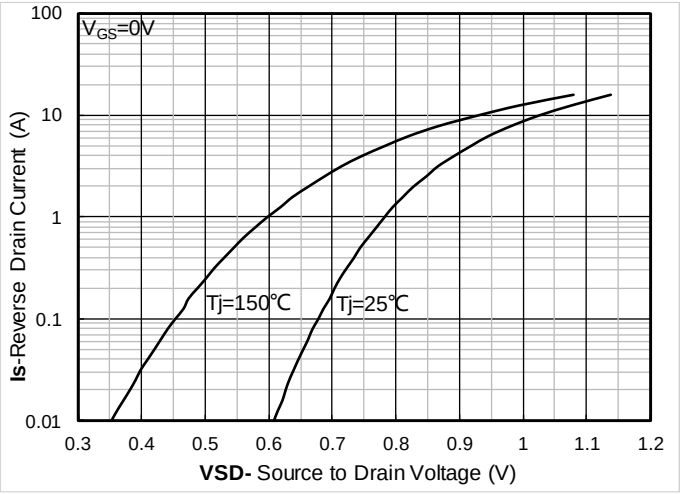


Figure 8. Forward characteristics of reverse diode; typical values

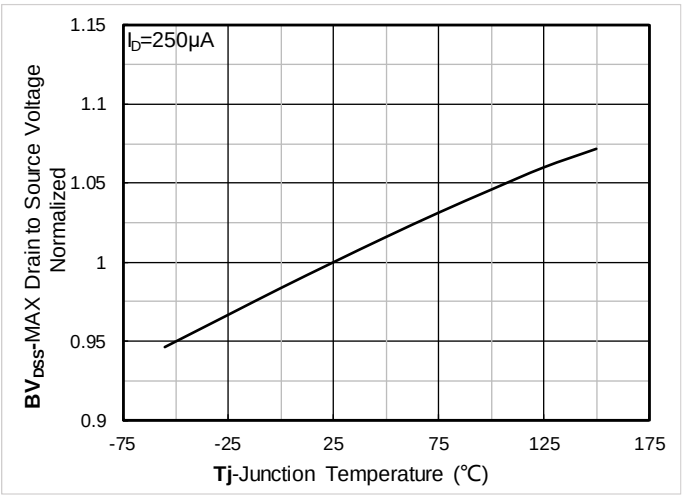


Figure 9. Normalized breakdown voltage

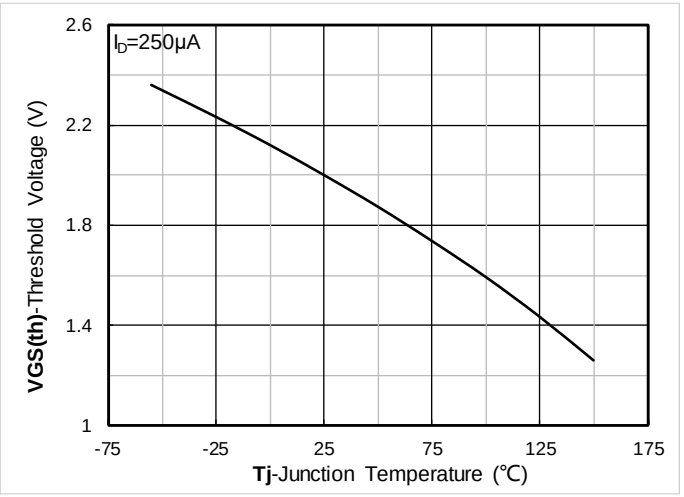


Figure 10. Gate Threshold voltage; typical values

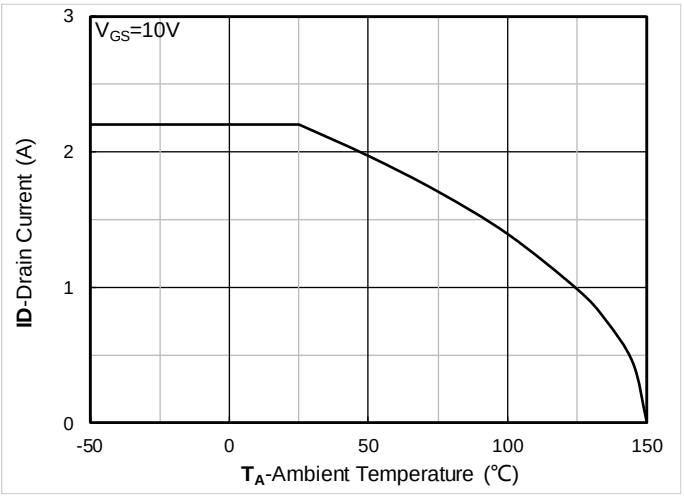


Figure 11. Current dissipation

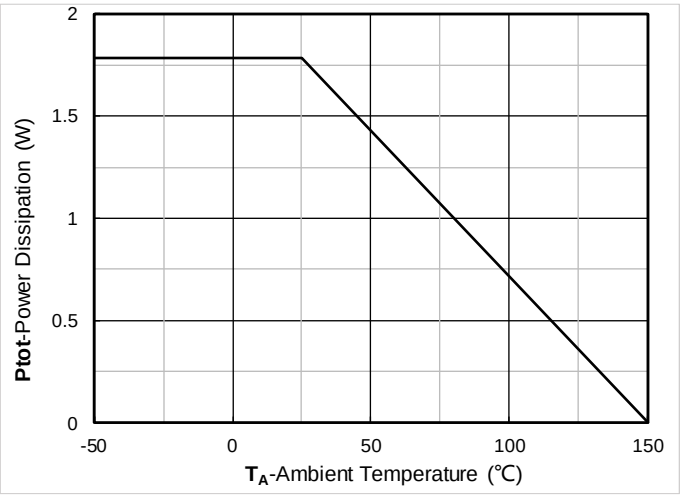


Figure 12. Power dissipation

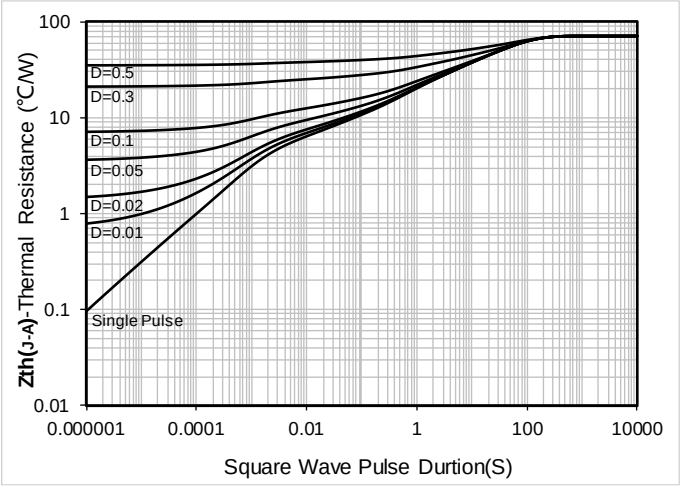


Figure 13. Maximum Transient Thermal Impedance

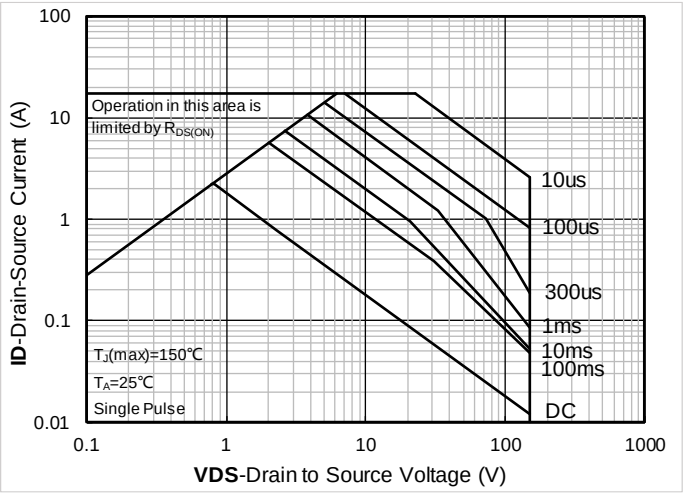
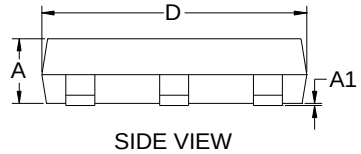
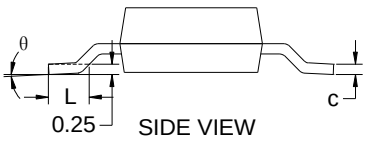


Figure 14. Safe Operation Area

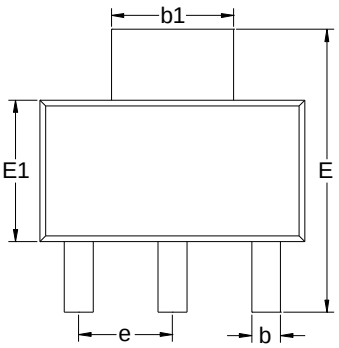
■ SOT-223 Package information



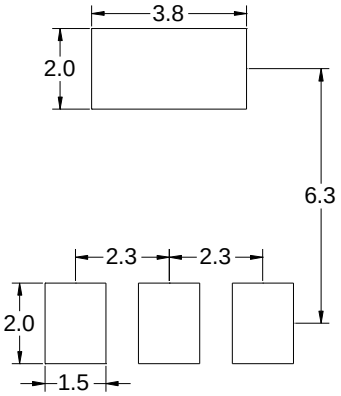
SIDE VIEW



SIDE VIEW



TOP VIEW



SUGGESTED SOLDER PAD LAYOUT

DIMENSIONS				
DIM	INCHES		MM	
	MIN	MAX	MN	MAX
A	0.0591	0.0670	1.5000	1.7000
A1	0.0008	0.0039	0.0200	0.1000
b	0.0259	0.0330	0.6600	0.8400
b1	0.1140	0.1220	2.9000	3.1000
c	0.0090	0.0138	0.2300	0.3500
D	0.2480	0.2640	6.3000	6.7000
E	0.2637	0.2874	6.7000	7.3000
E1	0.1290	0.1460	3.3000	3.7000
e	0.0866	0.0945	2.2000	2.4000
L	0.0295	0.0492	0.7500	1.2500
θ	0°	10°	0°	10°

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