

Features

- **Fast Switching**
- **Low ON Resistance**($R_{ds(on)} \leq 500\Omega$)
- **Low Gate Charge** (Typical Data: 3.1nC)
- **Low Reverse transfer capacitances**(Typical: 1.3pF)
- **Halogen Free**

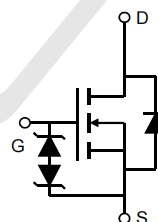
Applications

- TV power.

SOT23



Circuit Diagram



Absolute Maximum Ratings (T_{amb}=25°C unless otherwise specified)

Symbol	Parameter	Rating	Units
V _{DSS}	Drain-to-Source Voltage	600	V
I _D	Continuous Drain Current	0.04	A
	Continuous Drain Current T _C = 100 °C	0.02	A
I _{DM} ^{a1}	Pulsed Drain Current	0.16	A
V _{GS}	Gate-to-Source Voltage	±20	V
dv/dt ^{a2}	Peak Diode Recovery dv/dt	5.0	V/ns
P _D	Power Dissipation (T _A =25°C)	0.5	W
V _{ESD(G-S)}	Gate source ESD (HBM-C= 100pF, R=1.5kΩ)	2000	V
T _J , T _{stg}	Operating Junction and Storage Temperature Range	150, -55 to 150	°C

Electrical Characteristics (TA=25°C unless otherwise specified)

OFF Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
V_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	600	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	Bvdss Temperature Coefficient	$I_D=250\mu A, \text{Reference } 25^\circ C$	--	0.6	--	V/°C
I_{DSS}	Drain to Source Leakage Current	$V_{DS}=600V, V_{GS}=0V, T_a=25^\circ C$	--	--	1	μA
		$V_{DS}=480V, V_{GS}=0V, T_a=125^\circ C$	--	--	100	μA
$I_{GSS(F)}$	Gate to Source Forward Leakage	$V_{GS}=+20V$	--	--	10	μA
$I_{GSS(R)}$	Gate to Source Reverse Leakage	$V_{GS}=-20V$	--	--	-10	μA

ON Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$R_{DS(ON)}$	Drain-to-Source On-Resistance	$V_{GS}=10V, I_D=0.016A$	--	160	500	Ω
		$V_{GS}=4.5V, I_D=0.016A$	--	180	600	Ω
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{DS}=5V, I_D=8\mu A$	1.4	2.0	3.2	V
Pulse width $t_p \leq 300\mu s, \delta \leq 2\%$						

Dynamic Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
R_g	Gate resistance	$f=1.0MHz$	3	15	27	Ω
g_{fs}	Forward Transconductance	$V_{DS}=40V, I_D=0.016A$	0.04	0.07	0.11	S
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=25V, f=1.0MHz$	11.4	16.3	21.1	pF
C_{oss}	Output Capacitance		0.1	0.2	0.3	
C_{rss}	Reverse Transfer Capacitance		0.3	1.3	2.4	

Resistive Switching Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
$t_{d(ON)}$	Turn-on Delay Time	$I_D=16mA, V_{DD}=300V, R_G=10\Omega$	--	6.5	13.0	ns
t_r	Rise Time		--	6.9	13.9	
$t_{d(OFF)}$	Turn-Off Delay Time		--	13.9	27.8	
t_f	Fall Time		--	8.5	17.1	
Q_g	Total Gate Charge	$I_D=0.2A, V_{DD}=400V, V_{GS}=10V$	1.6	3.1	4.7	nC
Q_{gs}	Gate to Source Charge		0.07	0.4	0.7	
Q_{gd}	Gate to Drain ("Miller") Charge		0.4	1.9	3.4	

Source-Drain Diode Characteristics						
Symbol	Parameter	Test Conditions	Rating			Units
			Min.	Typ.	Max.	
I_S	Continuous Source Current (Body Diode)		--	--	0.04	A
I_{SM}	Maximum Pulsed Current (Body Diode)		--	--	0.16	A
V_{SD}	Diode Forward Voltage	$I_S=0.016A, V_{GS}=0V$	--	--	1.5	V
t_{rr}	Reverse Recovery Time	$I_S=16mA, T_J = 25^\circ C$	65	130	195	ns
Q_{rr}	Reverse Recovery Charge	$dI_F/dt=100A/us, V_{GS}=0V$	7	14	21	nC
Pulse width $t_p \leq 300\mu s, \delta \leq 2\%$						

Symbol	Parameter	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient	250	$^\circ C/W$

^{a1}: Repetitive rating; pulse width limited by maximum junction temperature

^{a2}: $I_{SD}=0.01A, di/dt \leq 100A/us, V_{DD} \leq BV_{DS}, \text{Start } T_J=25^\circ C$

Typical Performance Characteristics ($T_A=25^\circ\text{C}$ unless otherwise Specified)

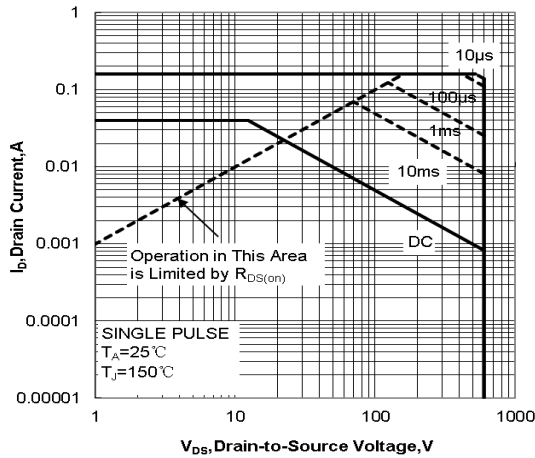


Figure.1 Maximum Forward Bias Safe Operating Area

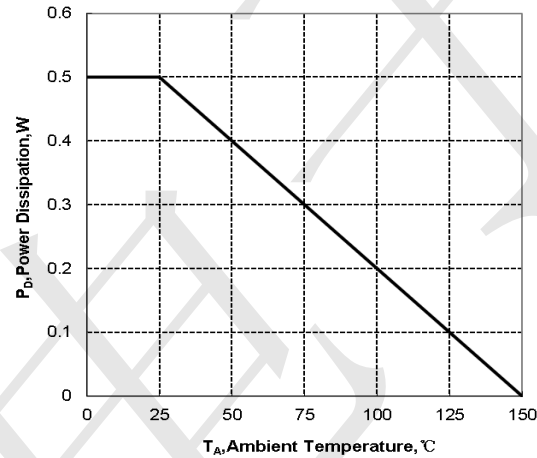


Figure.2 Maximum Power Dissipation vs Ambient Temperature

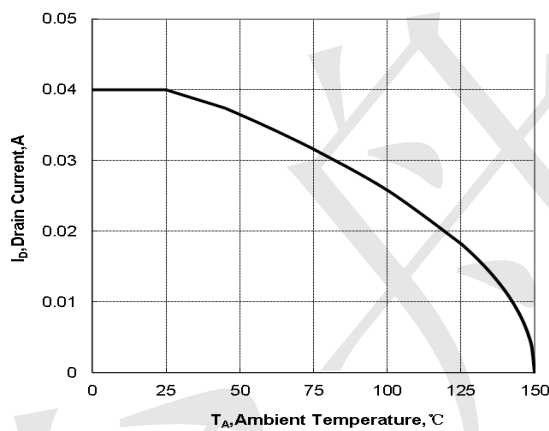


Figure.3 Maximum Continuous Drain Current vs Ambient Temperature

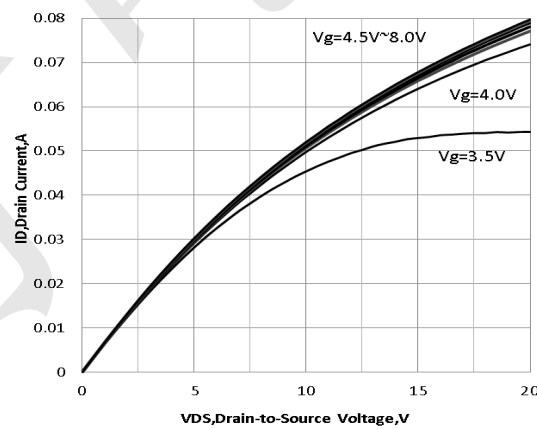


Figure.4 Typical Output Characteristics

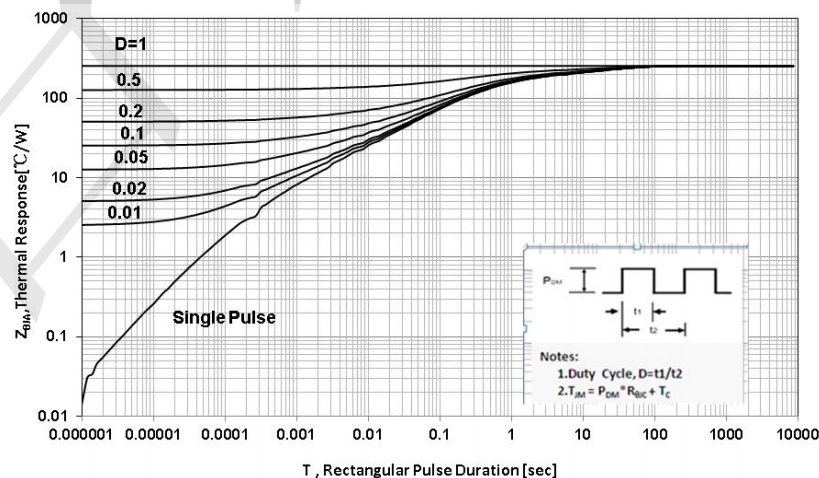


Figure.5 Maximum Effective Thermal Impedance, Junction to Ambient



TECH PUBLIC

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AO3160E

600V, 0.04A N-Channel MOSFET

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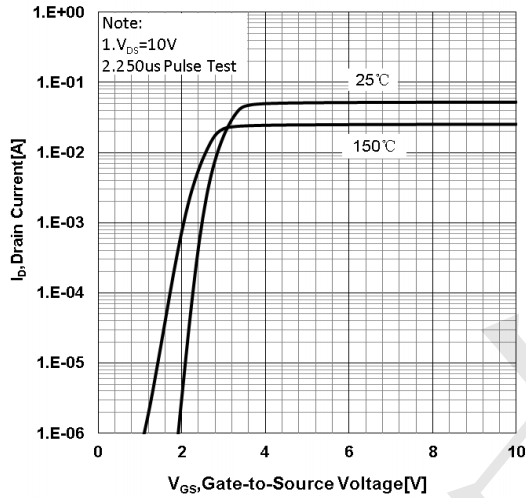


Figure.6 Typical Transfer Characteristics

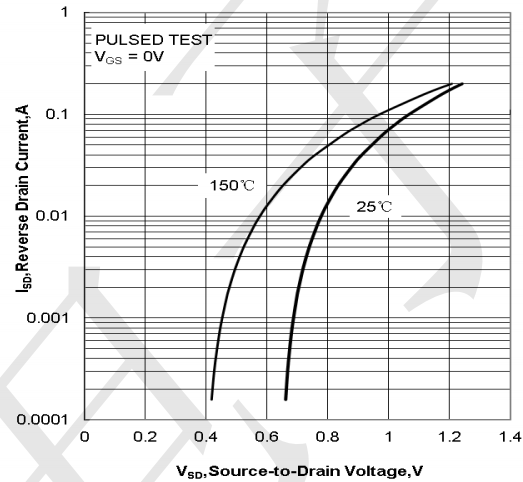


Figure.7 Typical Body Diode Transfer Characteristics

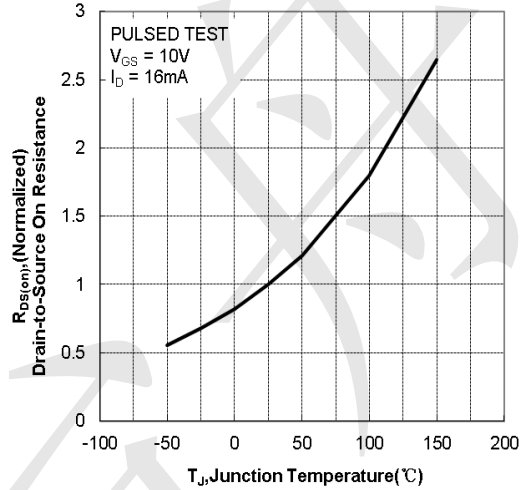


Figure.8 Typical Drain to Source on Resistance vs Junction Temperature

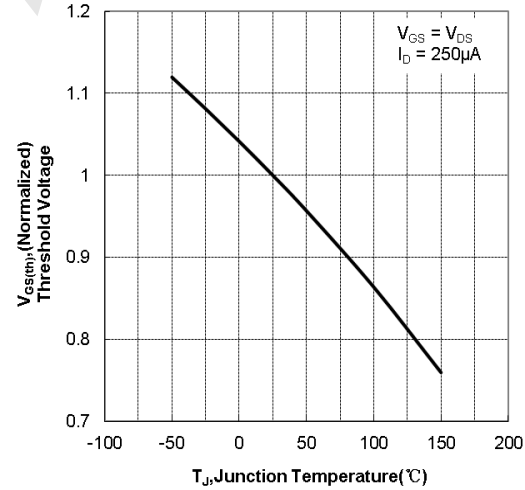


Figure.9 Typical Threshold Voltage vs Junction Temperature

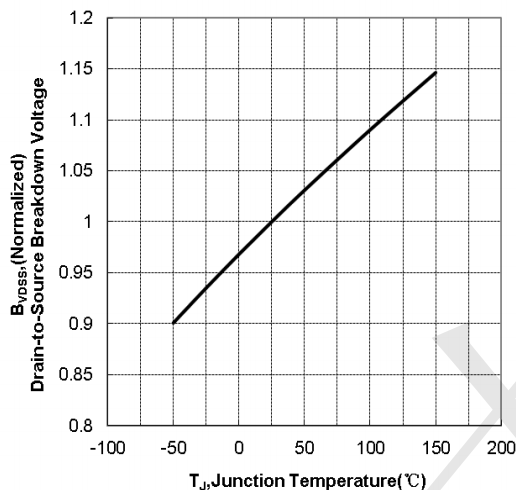


Figure.10 Typical Breakdown Voltage vs Junction Temperature

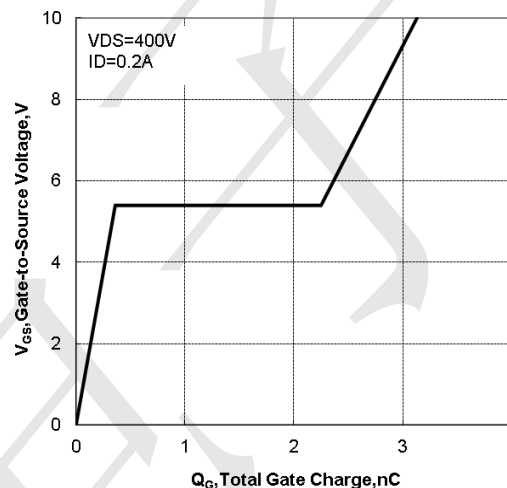


Figure.11 Typical Gate Charge vs Gate to Source Voltage Temperature

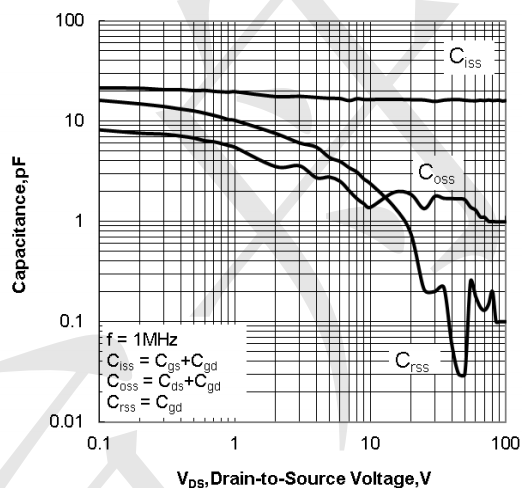
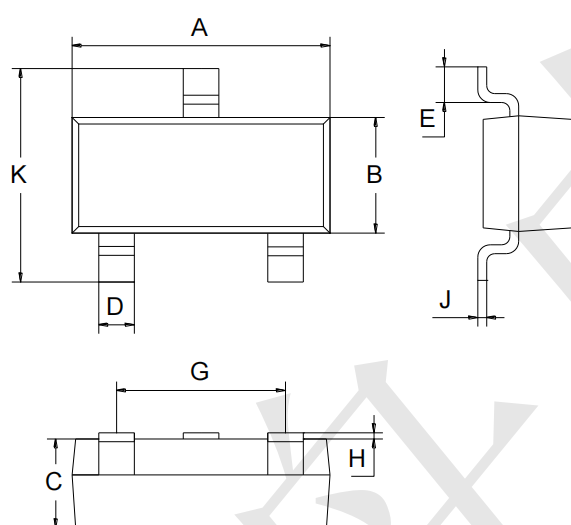


Figure.12 Typical Capacitance vs Drain to Source Voltage

Package Outline Dimensions Unit: mm



SOT-23		
Dimension	Min.	Max.
A	2.70	3.10
B	1.10	1.50
C	0.90	1.10
D	0.30	0.50
E	0.35	0.48
G	1.80	2.00
H	0.02	0.10
J	0.05	0.15
K	2.20	2.60

Mounting Pad Layout (Unit: mm)

