

RoHS Compliant Product
A suffix of "-C" specifies halogen & lead-free

FEATURES

- ESD Protected
- Fast Switching Speed
- Green Device Available

APPLICATION

- Load Switch
- Hand-Held Instruments

MARKING

E38

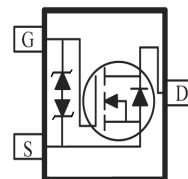
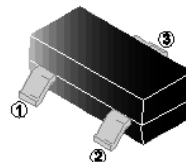
PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch

ORDER INFORMATION

Part Number	Type
SMS0A3N05-C	Lead (Pb)-free and Halogen-free

SOT-23



ABSOLUTE MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	55	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	360	mA
Pulsed Drain Current	I_{DM}	2	A
Total Power Dissipation ¹	P_D	350	mW
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55~150	$^{\circ}\text{C}$
Thermal Resistance Ratings			
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	357	$^{\circ}\text{C/W}$

Note:

1. 1*MRP FR-4 PC board, 2oz.

ELECTRICAL CHARACTERISTICS ($T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	55	-	-	V	$V_{GS}=0V, I_D=10\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	0.8	-	1.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Gate-Source Leakage Current	I_{GSS}	-	-	± 10	μA	$V_{GS}=\pm 20V, V_{DS}=0V$
Drain-Source Leakage Current	I_{DSS}	-	-	1	μA	$V_{DS}=55V, V_{GS}=0V$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	-	1.3	1.6	Ω	$V_{GS}=10V, I_D=500mA$
		-	1.5	2.5		$V_{GS}=4.5V, I_D=200mA$
		-	2.6	-		$V_{GS}=2.5V, I_D=100mA$
Forward Transconductance	g_{fs}	-	400	-	mS	$V_{DS}=10, I_D=250mA$
Total Gate Charge	Q_g	-	1	-	nC	$V_{DS}=15V, V_{GS}=5V, I_D=200mA$
Turn-on Delay Time	$T_{d(on)}$	-	1.3	-	nS	$V_{DD}=30V, V_{GS}=10V$ $R_G=10\Omega, R_L=150\Omega$ $I_D=200mA$
Turn-off Delay Time	$T_{d(off)}$	-	5.5	-		
Input Capacitance	C_{iss}	-	50	-	pF	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$
Output Capacitance	C_{oss}	-	7	-		
Reverse Transfer Capacitance	C_{rss}	-	4	-		
Source-Drain Diode						
Continuous Source Current	I_S	-	-	500	mA	$V_D=V_G=0V$, Force Current
Diode Forward Voltage	V_{SD}	-	0.94	1.2	V	$I_S=500mA, V_{GS}=0V$
Reverse Recovery Time	t_{rr}	-	14.4	-	nS	$V_{GS}=0V, V_{DD}=30V, I_S=1A$ $dI_S/dt=100A/\mu s$
Reverse Recovery Charge	Q_{rr}	-	5.8	-	nC	

CHARACTERISTIC CURVES

FIG. 1-Output Characteristic

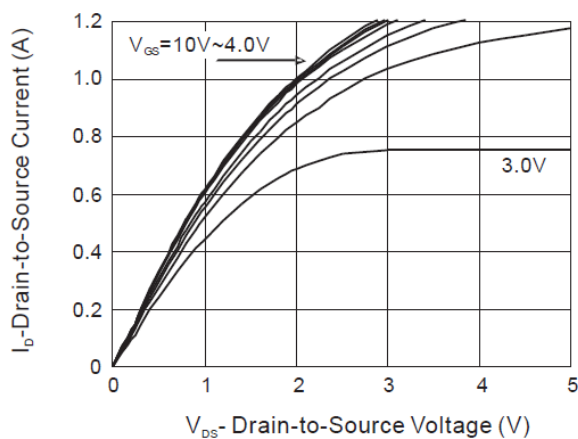


FIG. 2-Transfer Characteristic

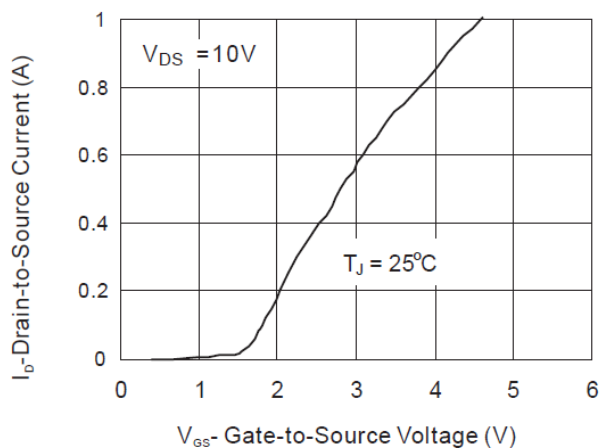


FIG. 3-On-Resistance vs Drain Current

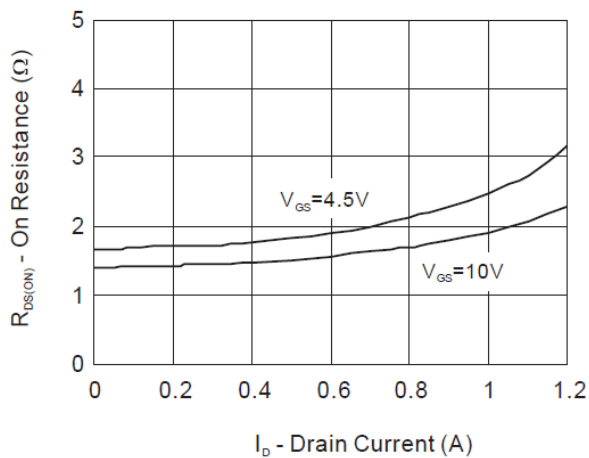


FIG. 4-On-Resistance vs Gate to Source Voltage

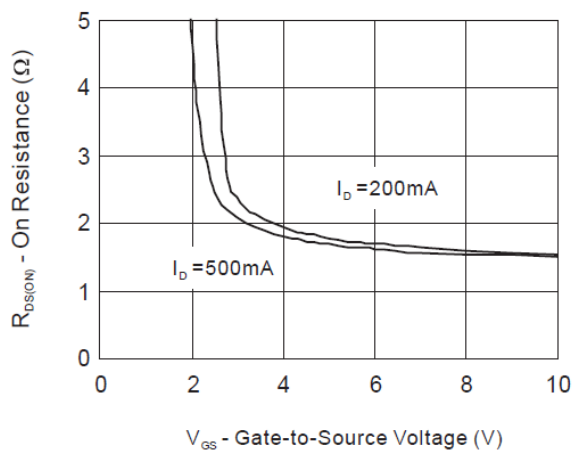


FIG. 5-On-Resistance vs Junction Temperature

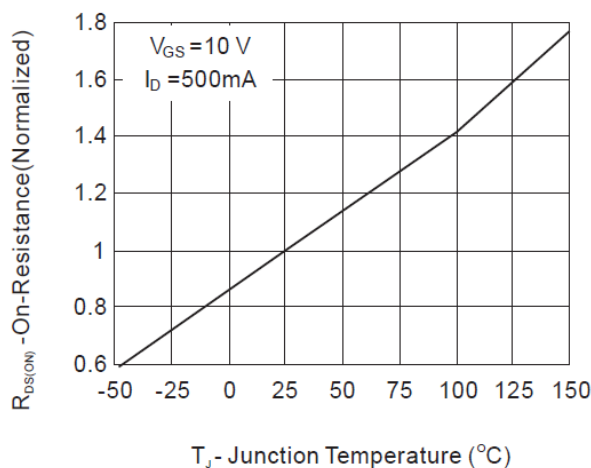
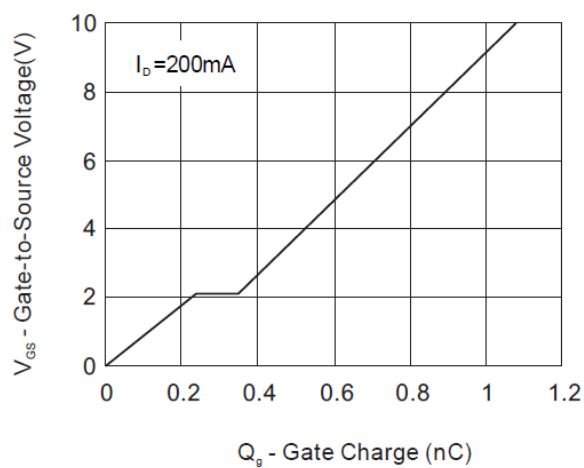


FIG. 6-Gate Charge Waveform



CHARACTERISTIC CURVES

FIG. 7-Source-Drain Diode Forward Voltage

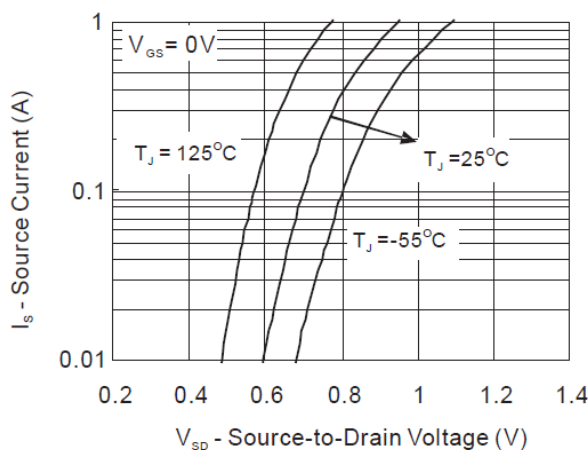


FIG. 8-Threshold Voltage vs Temperature

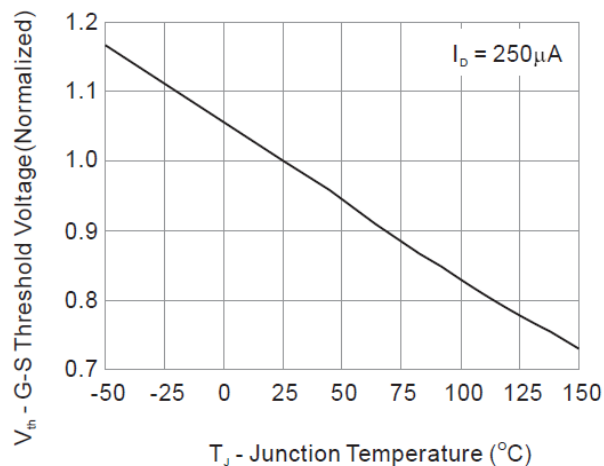


FIG. 9-Breakdown Voltage vs Junction Temperature

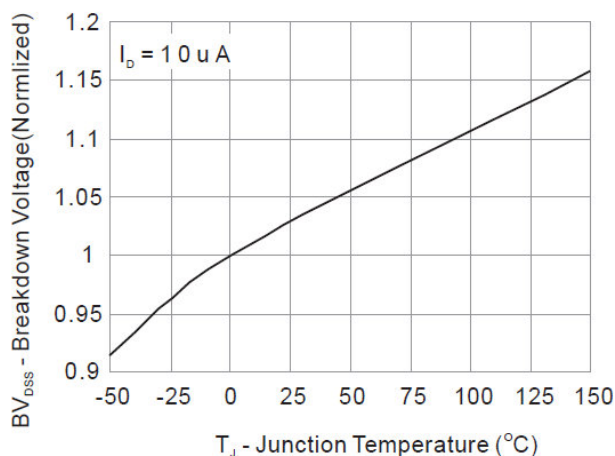
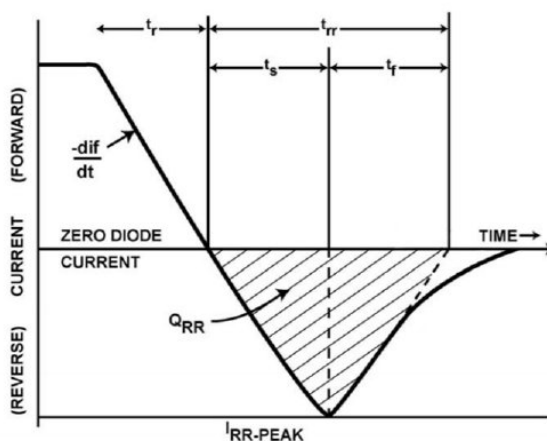
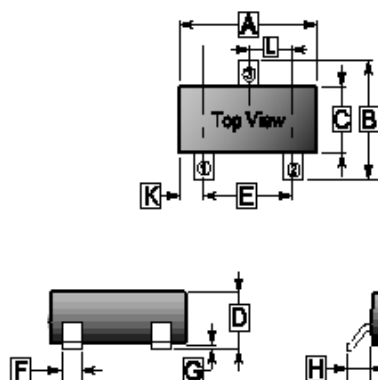


FIG. 10-QRR and TRR Waveform definitions



PACKAGE OUTLINE DIMENSIONS

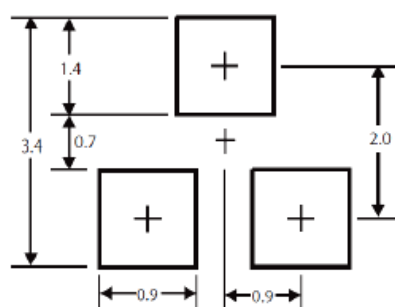
SOT-23



REF.	Millimeter	
	Min.	Max.
A	2.65	3.10
B	2.10	3.00
C	1.10	1.80
D	0.89	1.45
E	1.70	2.30
F	0.28	0.55
G	-	0.18
H	0.55 REF.	
J	0.05	0.26
K	0.60 REF.	
L	0.95 TYP.	

MOUNTING PAD LAYOUT

SOT-23



*Dimensions in millimeters