

RoHS Compliant Product

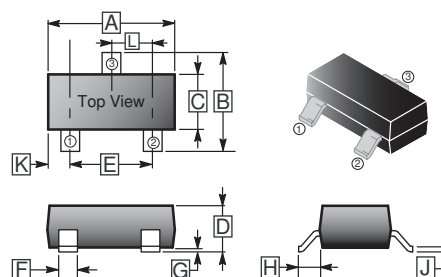
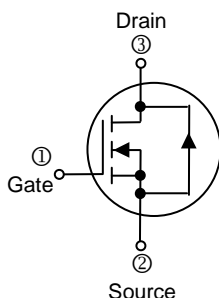
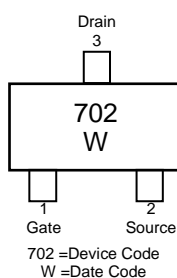
A suffix of "-C" specifies halogen & lead-free

**SOT-23**

## FEATURES

- Pb-Free Package is Available

## PACKAGING INFORMATION



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.80	3.04	G	0.013	0.10
B	2.10	2.55	H	0.45	0.60
C	1.20	1.40	J	0.08	0.177
D	0.89	1.15	K	0.6 REF.	
E	1.80	2.00	L	0.89	1.02
F	0.30	0.50			

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

PARAMETER	SYMBOL	RATING	UNIT
Drain-Source Voltage	$V_{DS}$	60	Vdc
Drain-Gate Voltage ( $R_{GS}=1.0 \text{ M}\Omega$ )	$V_{DGR}$	60	Vdc
Continuous Drain Current	$I_D$	$T_C=25^\circ\text{C}$ <sup>1</sup>	$\pm 115$
		$T_C=100^\circ\text{C}$ <sup>1</sup>	$\pm 75$
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	$\pm 800$	mAdc
Continuous Gate-Source Voltage	$V_{GS}$	$\pm 20$	Vdc
Non-Repetitive Gate-Source Voltage ( $t_P \leq 50 \mu\text{s}$ )	$V_{GSM}$	$\pm 40$	Vpk
THERMAL CHARACTERISTICS			
Total Device Dissipation FR-5 Board <sup>3</sup>	$P_D$	$T_A=25^\circ\text{C}$	225
		Derate above $25^\circ\text{C}$	1.8
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Junction and Storage Temperature	$T_J, T_{STG}$	-55~150	$^\circ\text{C}$

Note: 1. The Power Dissipation of the package may result in a lower continuous drain current.

2. Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

3. FR-5 = 1.0 x 0.75 x 0.062 in.

4. Alumina = 0.4 x 0.3 x 0.025 in 99.5% alumina

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITION
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	60	-	-	Vdc	$V_{GS} = 0, I_D = 10 \mu\text{Adc}$
Zero Gate Voltage Drain Current	$I_{DSS}$	$T_J=25^\circ\text{C}$	-	1.0	$\mu\text{Adc}$	$V_{GS}=0, V_{DS} = 60 \text{Vdc}$
		$T_J=125^\circ\text{C}$	-	500		
Gate-Body Leakage Current, Forward	$I_{GSSF}$	-	-	100	nAdc	$V_{GS}=20 \text{Vdc}$
Gate-Body Leakage Current, Reverse	$I_{GSSR}$	-	-	-100	nAdc	$V_{GS}=-20 \text{Vdc}$
ON CHARACTERISTICS <sup>1</sup>						
Gate Threshold Voltage	$V_{GS(th)}$	1.0	1.6	2.5	Vdc	$V_{DS} = V_{GS}, I_D = 250 \mu\text{Adc}$
On-State Drain Current	$I_{D(ON)}$	500	-	-	mA	$V_{DS} \geq 2.0 V_{DS(ON)}, V_{GS} = 10 \text{Vdc}$
Static Drain-Source On-State Voltage	$V_{DS(ON)}$	-	-	3.75	Vdc	$V_{GS} = 10 \text{Vdc}, I_D = 500 \text{mAdc}$
		-	-	0.375	Vdc	$V_{GS} = 5 \text{Vdc}, I_D = 50 \text{mAdc}$
Static Drain-Source On-State Resistance ( $T_A=25^\circ\text{C}$ )	$R_{DS(ON)}$	-	1.4	7.5	$\Omega$	$V_{GS} = 10 \text{Vdc}, I_D = 500 \text{mAdc}$
		-	1.8	7.5	$\Omega$	$V_{GS} = 5 \text{Vdc}, I_D = 50 \text{mAdc}$
Static Drain-Source On-State Resistance ( $T_A=125^\circ\text{C}$ )	$R_{DS(ON)}$	-	-	13.5	$\Omega$	$V_{GS} = 10 \text{Vdc}, I_D = 500 \text{mAdc}$
		-	-	13.5	$\Omega$	$V_{GS} = 5 \text{Vdc}, I_D = 50 \text{mAdc}$
Forward Transconductance	$g_{FS}$	80	-	-	mmhos	$V_{DS} \geq 2 V_{DS(ON)}, I_D = 200 \text{mAdc}$
DYNAMIC CHARACTERISTICS						
Input Capacitance	$C_{ISS}$	-	17	50	pF	$V_{DS}=25 \text{Vdc}, V_{GS}=0, f=1 \text{MHz}$
Output Capacitance	$C_{OSS}$	-	10	25	pF	$V_{DS}=25 \text{Vdc}, V_{GS}=0, f=1 \text{MHz}$
Reverse Transfer Capacitance	$C_{fss}$	-	2.5	5.0	pF	$V_{DS}=25 \text{Vdc}, V_{GS}=0, f=1 \text{MHz}$
SWITCHING CHARACTERISTICS <sup>1</sup>						
Turn-On Delay Time	$t_{d(ON)}$	-	7	20	nS	$V_{DD}=25 \text{Vdc}, I_D=500 \text{mAdc}$ $R_G=25 \Omega, R_L=50 \Omega, V_{GEN}=10 \text{V}$
Turn-Off Delay Time	$t_{d(OFF)}$	-	11	40		
BODY-DRAIN DIODE RATINGS						
Diode Forward On-Voltage	$V_{SD}$	-	-	-1.5	Vdc	$I_S=11.5 \text{mAdc}, V_{GS}=0 \text{V}$
Source Current Continuous (Body Diode)	$I_S$	-	-	-115	mAdc	
Source Current Pulsed	$I_{SM}$	-	-	-800	mAdc	

Note: 1. Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

**RATINGS AND CHARACTERISTIC CURVES**

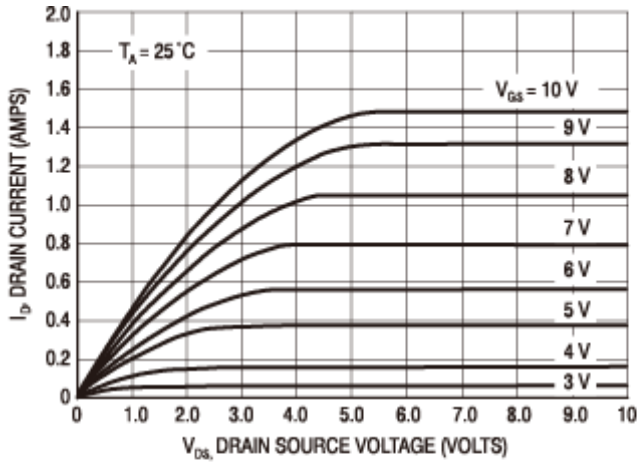


Figure 1. Ohmic Region

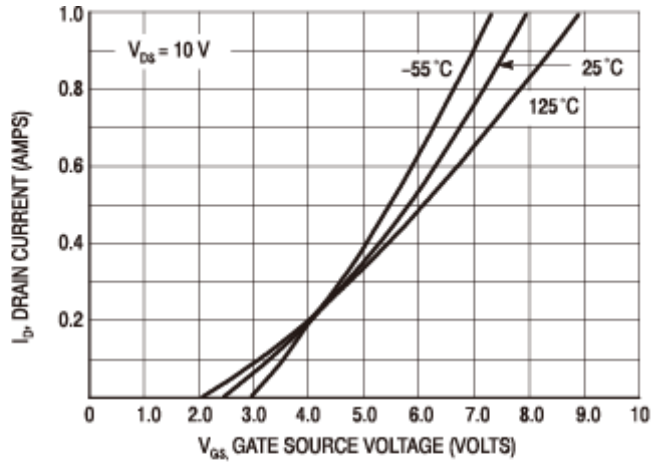


Figure 2. Transfer Characteristics

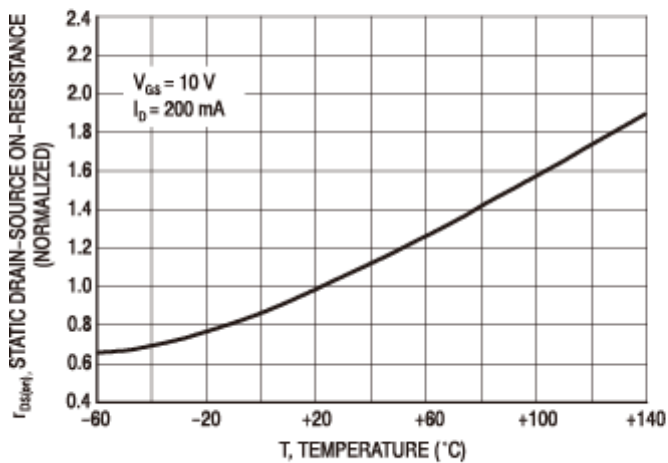


Figure 3. Temperature versus Static Drain-Source On-Resistance

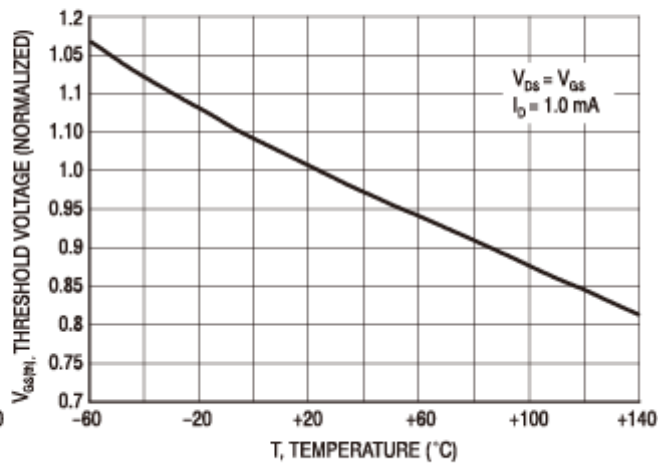


Figure 4. Temperature versus Gate Threshold Voltage