

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

DESCRIPTION

These miniature surface mount MOSFETs reduce power loss conserve energy, making this device ideal for use in small power management circuitry.

FEATURES

- Energy Efficient

APPLICATION

DC-DC converters, load switching, power management in portable and battery-powered products such as computers, printers, cellular and cordless telephones.

MARKING



PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-723	8K	7 inch

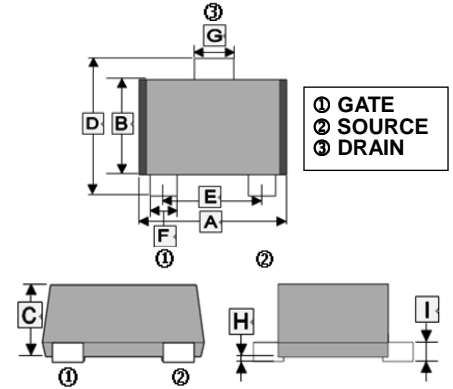
THERMAL CHARACTERISTICS

Parameter		Symbol	Rating	Unit
Drain – Source Voltage		V_{DS}	20	V
Gate – Source Voltage - Continuous		V_{GS}	±10	V
Continuous Drain Current ¹	Steady State	I_D	$T_A=25^{\circ}C$	255
			$T_A=85^{\circ}C$	185
	$t \leq 5$ s, $T_A=25^{\circ}C$			285
Power Dissipation ¹	Steady State, $T_A=25^{\circ}C$		P_D	440
	$t \leq 5$ s, $T_A=25^{\circ}C$			545
Continuous Drain Current ²	Steady State	I_D	$T_A=25^{\circ}C$	210
			$T_A=85^{\circ}C$	155
Power Dissipation ²	Steady State, $T_A=25^{\circ}C$		P_D	310
Pulsed Drain Current ($t_p \leq 10\mu s$)		I_{DM}	400	mA
Source Current (Body Diode) ²		I_S	286	mA
Maximum Lead Temperature for Soldering Purposes, (1/8" from case for 10 seconds)		T_L	260	°C
Junction & Storage Temperature		T_J, T_{STG}	-55 ~ 150	°C

NOTE:

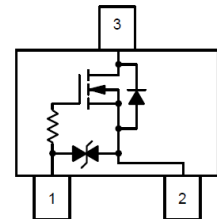
1. Surface-mounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq [1 oz] including traces)
2. Surface-mounted on FR4 board using the minimum recommended pad size.

SOT-723



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	1.150	1.250	F	0.170	0.270
B	0.750	0.850	G	0.270	0.370
C	-	0.500	H	0	0.050
D	1.150	1.250	I	-	0.150
E	0.800TYP.				

Top View



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

Parameter	Symbol	Rating	Unit
Maximum Junction–Ambient	Steady State ¹	280	°C / W
	$t = 5 \text{ s}^{-1}$	228	
	Steady State Minimum Pad ²	400	

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Teat Conditions
OFF Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	20	-	-	V	$V_{GS}=0, I_D=100\mu\text{A}$
Drain–Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS} / T_J$	-	27	-	mV/°C	$I_D=100\mu\text{A}$, Reference to 25°C
Gate-Source Leakage Current	I_{GSS}	-	-	1	μA	$V_{GS} = \pm 5\text{V}, V_{DS}=0$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS}=16\text{V}, V_{GS}=0, T_J = 25^\circ\text{C}$
		-	-	10		$V_{DS}=16\text{V}, V_{GS}=0, T_J = 125^\circ\text{C}$
ON Characteristics ¹						
Gate Threshold Voltage	$V_{GS(TH)}$	0.4	-	1.3	V	$V_{DS}=V_{GS}, I_D = 250\mu\text{A}$
Gate Threshold Temperature Coefficient	$V_{GS(TH)} / T_J$	-	-2.4	-	mV/°C	
Forward Transconductance	g_{FS}	-	0.275	-	S	$V_{DS}=5\text{V}, I_D=100\text{mA}$
Drain-Source On Resistance	$R_{DS(ON)}$	-	1.5	3.4	Ω	$V_{GS}=4.5\text{V}, I_D=10\text{mA}$
		-	1.6	3.8		$V_{GS}=4.5\text{V}, I_D=255\text{mA}$
		-	2.4	4.5		$V_{GS}=2.5\text{V}, I_D=1\text{mA}$
		-	5.1	10		$V_{GS}=1.8\text{V}, I_D=1\text{mA}$
		-	6.8	15		$V_{GS}=1.65\text{V}, I_D=1\text{mA}$
Dynamic Characteristics						
Turn-on Delay Time	$T_{d(on)}$	-	13	-	nS	$V_{GS}=4.5\text{V}, V_{DD}=5\text{V}, I_D=10\text{mA}, R_G=6\Omega$
Rise Time	T_r	-	15	-		
Turn-off Delay Time	$T_{d(off)}$	-	94	-		
Fall Time ²	T_f	-	55	-		
Input Capacitance ²	C_{iss}	-	11	-	pF	$V_{DS}=10\text{V}, V_{GS}=0, f=1\text{MHz}$
Output Capacitance ²	C_{oss}	-	8.3	-		
Reverse Transfer Capacitance ²	C_{rss}	-	2.7	-		
Source-Drain Diode						
Forward Diode Voltage	V_{SD}	-	0.83	1.2	V	$V_{GS}=0\text{V}, I_S=286\text{mA}, T_J = 25^\circ\text{C}$
		-	0.69	-		$V_{GS}=0\text{V}, I_S=286\text{mA}, T_J = 125^\circ\text{C}$
Reverse Recovery Time	T_{rr}	-	9.1	-	nS	$V_{GS}=0\text{V}, V_{DD}=20\text{V}, dI_{SD}/dt=100\text{A}/\mu\text{S}, I_S=286\text{mA}$
Charge Time	T_a	-	7.1	-		
Discharge Time	T_b	-	2	-		
Reverse Recovery Charge ²	Q_{rr}	-	3.7	-		

Notes:

- Surface–mounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq [1 oz] including traces)
- Surface–mounted on FR4 board using the minimum recommended pad size.
- Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty cycle $\leq 2\%$
- Switching characteristics are independent of operating junction temperature.

CHARACTERISTIC CURVES

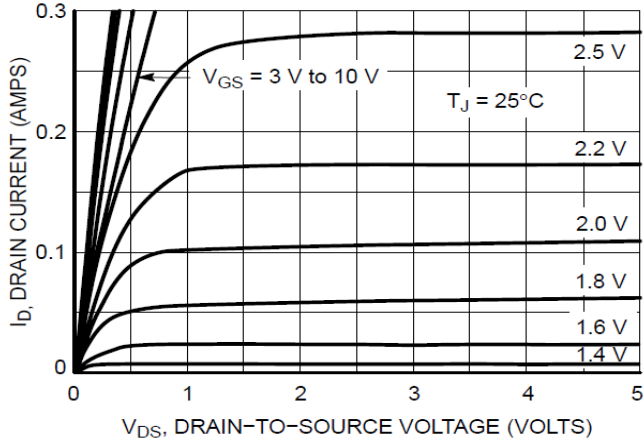


Figure 1. On-Region Characteristics

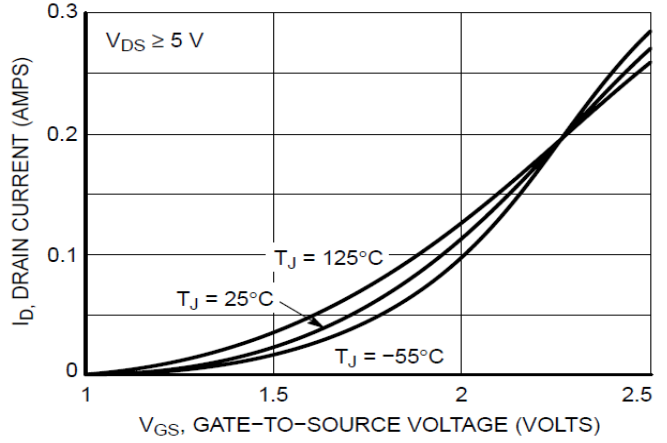


Figure 2. Transfer Characteristics

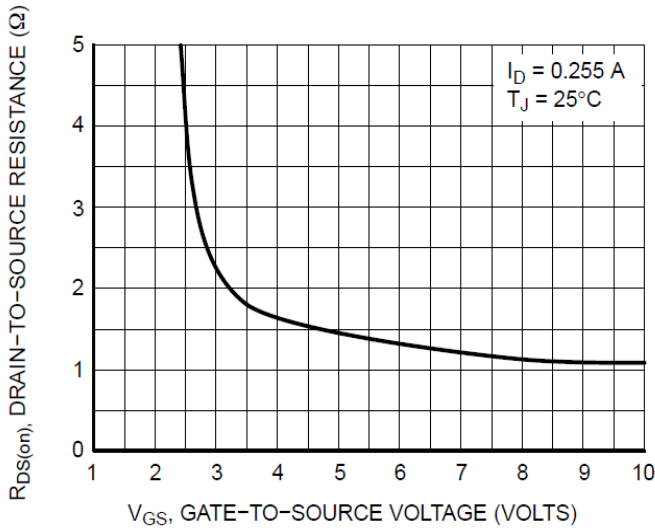


Figure 3. On-Resistance vs. Gate-to-Source Voltage

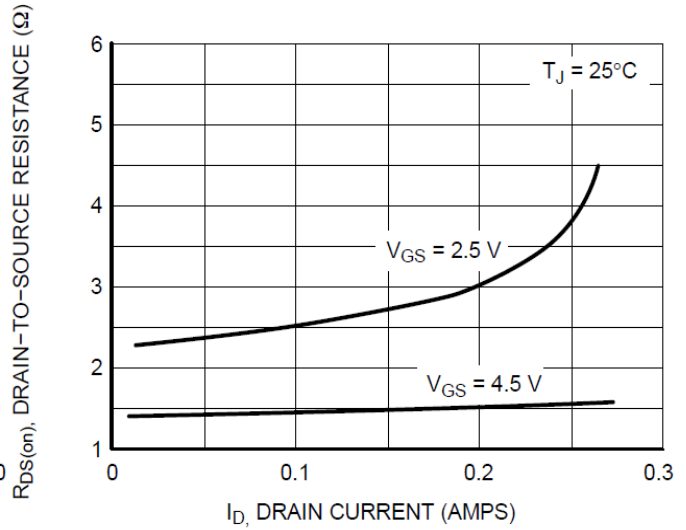


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

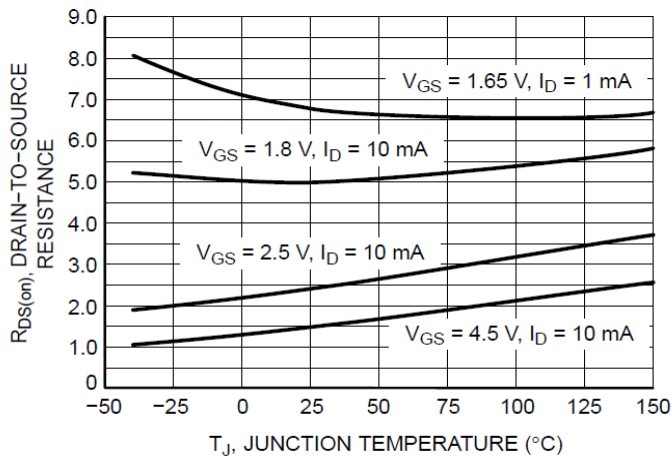


Figure 5. On-Resistance Variation with Temperature

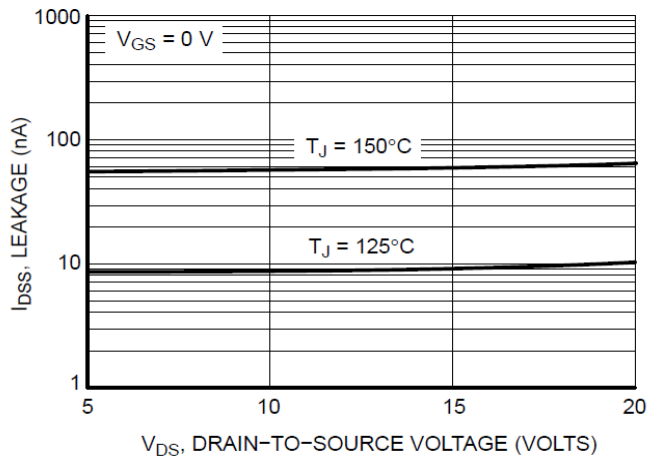


Figure 6. Drain-to-Source Leakage Current vs. Voltage

CHARACTERISTIC CURVES

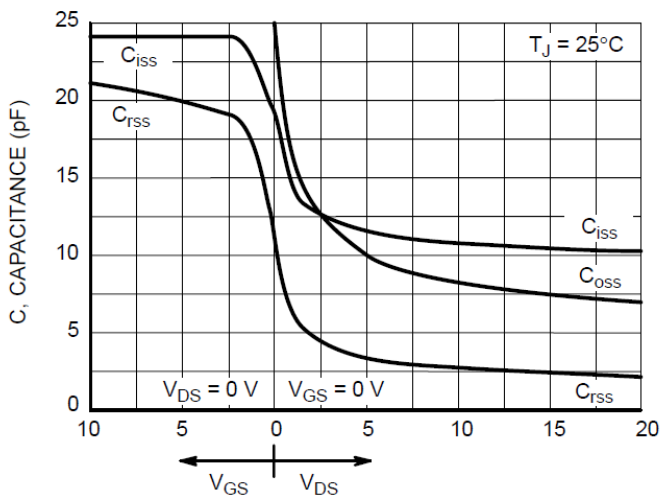


Figure 7. Capacitance Variation

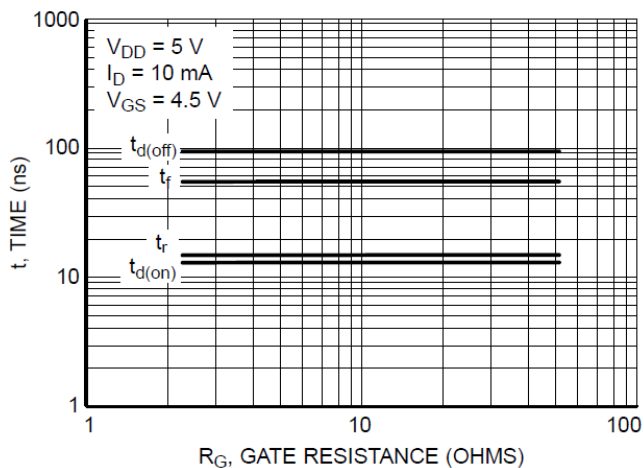


Figure 8. Resistive Switching Time Variation vs. Gate Resistance

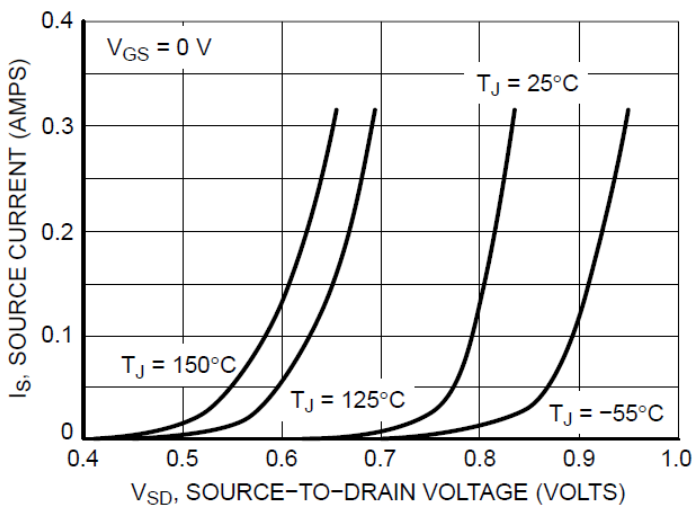


Figure 9. Diode Forward Voltage vs. Current