

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
- Miniature SOT-323 Surface Mount Package Saves Board Space

APPLICATION

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

MARKING



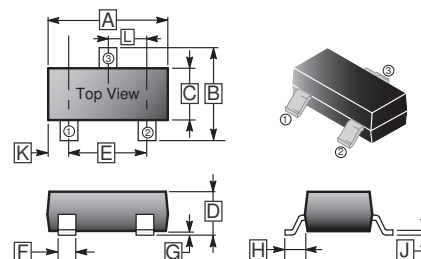
PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-323	3K	7 inch

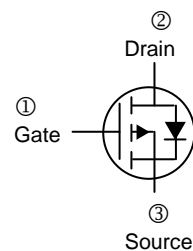
THERMAL CHARACTERISTICS

Parameter		Symbol	Rating	Unit
Total Device Dissipation FR-5 Board	$T_A=25^\circ\text{C}$	P_D	225	mW
	Derate above 25°C		1.8	mW / $^\circ\text{C}$
Maximum Junction-Ambient		$R_{\theta JA}$	556	$^\circ\text{C} / \text{W}$
Total Device Dissipation Alumina Substrate	$T_A=25^\circ\text{C}$	P_D	300	mW
	Derate above 25°C		2.4	mW / $^\circ\text{C}$
Maximum Junction-Ambient		$R_{\theta JA}$	417	$^\circ\text{C} / \text{W}$
Junction & Storage Temperature		T_J, T_{STG}	-55 ~ 150	$^\circ\text{C}$

SOT-323



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	1.80	2.20	G	0.100	REF.
B	1.80	2.45	H	0.525	REF.
C	1.15	1.35	J	0.08	0.25
D	0.80	1.10	K	-	-
E	1.20	1.40	L	0.650	TYP.
F	0.20	0.40			



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

Parameter	Symbol	Rating	Unit	
Drain – Source Voltage	V_{DS}	-50	V	
Gate – Source Voltage - Continuous	V_{GS}	± 20	V	
Continuous Drain Current	$T_A=25^\circ\text{C}$	I_D	-130	mA
	Pulsed Drain Current ($t_p \leq 10\mu\text{s}$)	I_{DM}	-520	
Total Power Dissipation	$T_A=25^\circ\text{C}$	P_D	225	mW
Maximum Lead Temperature for Soldering Purposes, for 10 seconds	T_L	260	$^\circ\text{C}$	
Maximum Junction–Ambient	$R_{\theta JA}$	556	$^\circ\text{C} / \text{W}$	
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55 ~ 150	$^\circ\text{C}$	

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	$V_{(BR)DSS}$	-50	-	-	V	$V_{GS}=0, I_D = -250\mu\text{A}$
Gate-Source Leakage Current	I_{GSS}	-	-	± 60	μA	$V_{GS} = \pm 20\text{V}, V_{DS}=0$
Drain-Source Leakage Current	I_{DSS}	-	-	-0.1	μA	$V_{DS} = -25\text{V}, V_{GS}=0$
		-	-	-15		$V_{DS} = -50\text{V}, V_{GS}=0$
		-	-	-60		$V_{DS} = -50\text{V}, V_{GS}=0, T_J = 125^\circ\text{C}$
ON Characteristics ¹						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.8	-	-2	V	$V_{DS}=V_{GS}, I_D = -1\text{mA}$
Transfer Admittance	$ y_{fs} $	50	-	-	mS	$V_{DS} = -25\text{V}, I_D = -100\text{mA}, f=1\text{kHz}$
Drain-Source On Resistance	$R_{DS(ON)}$	-	5	10	Ω	$V_{GS} = -5\text{V}, I_D = -100\text{mA}$
Dynamic Characteristics						
Turn-on Delay Time	$T_{d(on)}$	-	2.5	-	nS	$V_{DD} = -15\text{V}$ $I_D = -2.5\text{A}$ $R_L = 50\Omega$
Rise Time	T_r	-	1	-		
Turn-off Delay Time	$T_{d(off)}$	-	16	-		
Fall Time	T_f	-	8	-		
Gate Charge	Q_T	-	6000	-	pC	
Input Capacitance	C_{iss}	-	30	-	pF	$V_{DS} = -5\text{V}$
Output Capacitance	C_{oss}	-	10	-		$V_{DS} = -5\text{V}$
Reverse Transfer Capacitance	C_{rss}	-	5	-		$V_{DG} = -5\text{V}$
Source-Drain Diode						
Continuous Current	I_S	-	-	-0.130	A	
Pulsed Current	I_{SM}	-	-	-0.520		
Forward On Voltage ²	V_{SD}	-	-2.5	-	V	

Notes:

- Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty cycle $\leq 2\%$
- Switching characteristics are independent of operating junction temperature.

CHARACTERISTIC CURVES

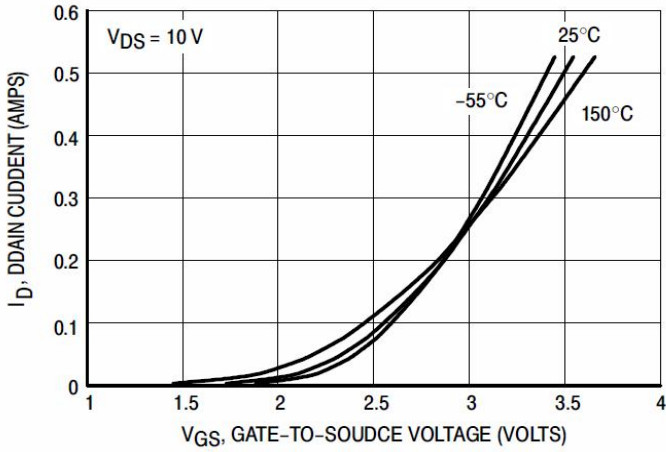


Figure 1. Transfer Characteristics

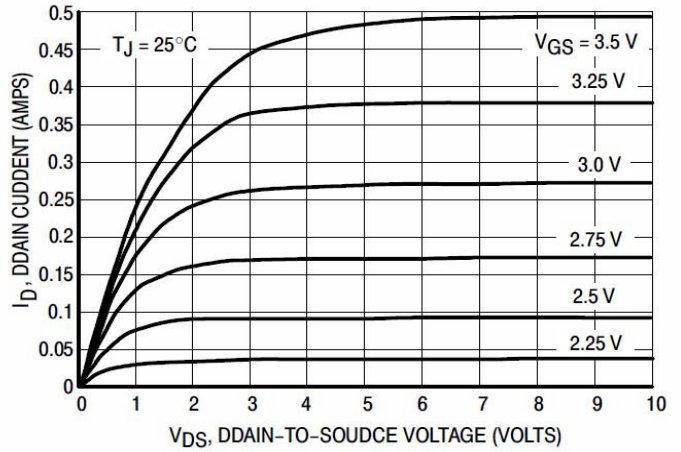


Figure 2. On-Region Characteristics

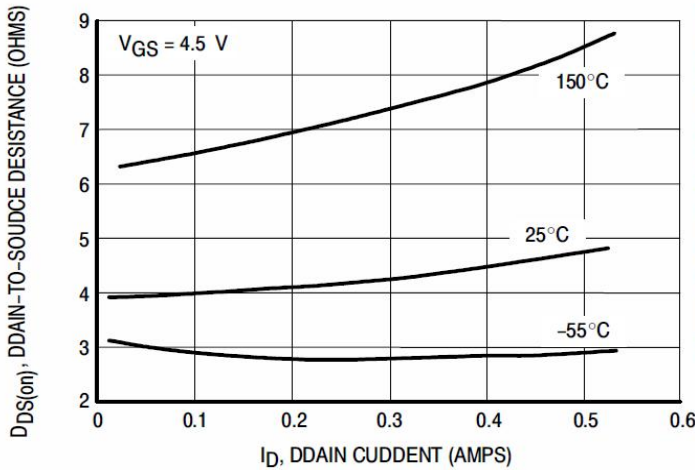


Figure 3. On-Resistance versus Drain Current

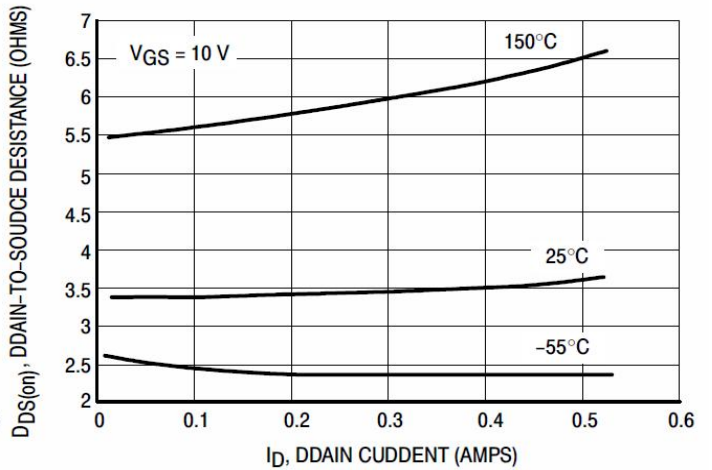


Figure 4. On-Resistance versus Drain Current

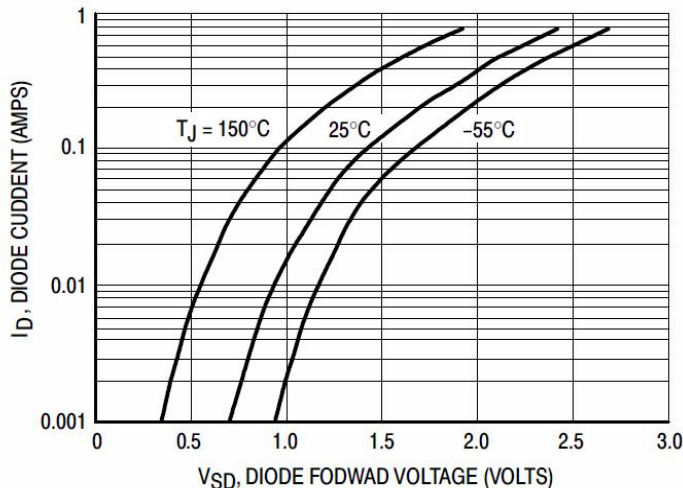


Figure 7. Body Diode Forward Voltage

CHARACTERISTIC CURVES

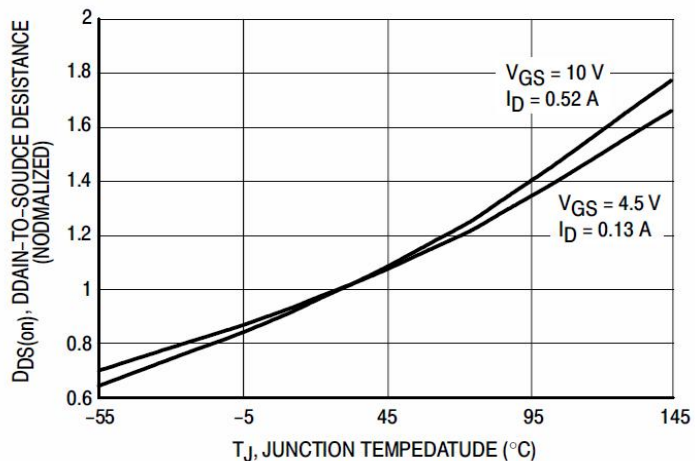


Figure 5. On-Resistance Variation with Temperature

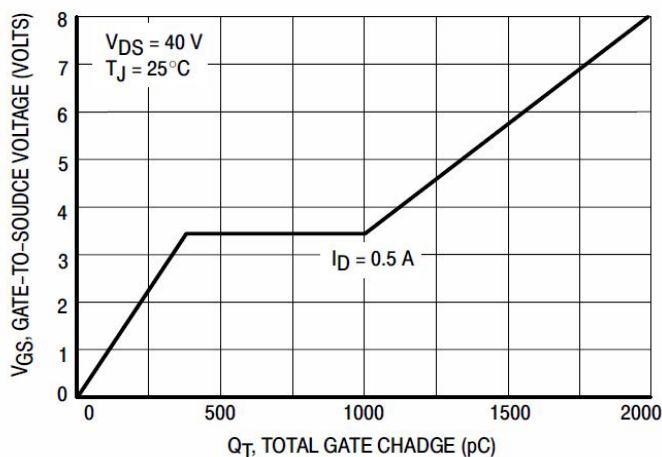


Figure 6. Gate Charge