

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

**DESCRIPTION**

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low  $R_{DS(on)}$  and to ensure minimal power loss and heat dissipation.

**MECHANICAL DATA**

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage

**APPLICATION**

- DC-DC converter circuit
- Load Switch

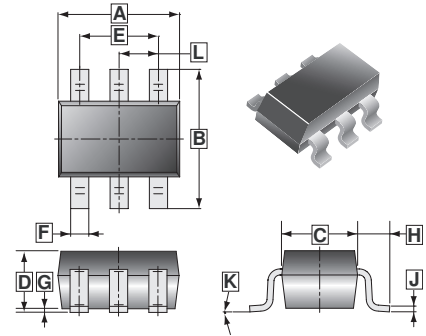
**MARKING**



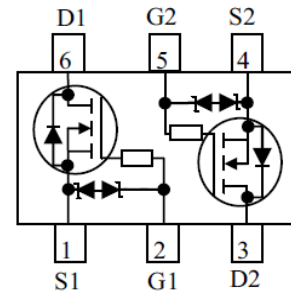
**PACKAGE INFORMATION**

Package	MPQ	Leader Size
SOT-363	3K	7 inch

**SOT-363**



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		8°
E	1.10	1.50	L	0.650	TYP.
F	0.10	0.35			



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

Parameter	Symbol	Rating		Unit	
		10S	Steady State		
Drain – Source Voltage	$V_{DS}$	20		V	
Gate – Source Voltage	$V_{GS}$	$\pm 6$		V	
Continuous Drain Current <sup>1</sup>	$I_D$	$T_A = 25^\circ\text{C}$	0.89	0.81	A
		$T_A = 70^\circ\text{C}$	0.71	0.64	
Power Dissipation <sup>1</sup>	$P_D$	$T_A = 25^\circ\text{C}$	0.38	0.31	W
		$T_A = 70^\circ\text{C}$	0.24	0.2	
Continuous Drain Current <sup>2</sup>	$I_D$	$T_A = 25^\circ\text{C}$	0.76	0.69	A
		$T_A = 70^\circ\text{C}$	0.61	0.55	
Power Dissipation <sup>2</sup>	$P_D$	$T_A = 25^\circ\text{C}$	0.28	0.23	W
		$T_A = 70^\circ\text{C}$	0.17	0.15	
Pulsed Drain Current <sup>3</sup>	$I_{DM}$	1.4		A	
Lead Temperature	$T_L$	260		$^\circ\text{C}$	
Operating Junction & Storage Temperature Range	$T_J, T_{STG}$	150, -55~150		$^\circ\text{C}$	

### THERMAL RESISTANCE RATINGS

Parameter	Symbol	Rating		Unit	
		Typ.	Max.		
Single Operation					
Junction-to-Ambient Thermal Resistance <sup>1</sup>	$T \leq 10S$	$R_{\theta JA}$	276	325	°C / W
	Steady State		328	395	
Junction-to-Ambient Thermal Resistance <sup>2</sup>	$T \leq 10S$	$R_{\theta JA}$	375	445	
	Steady State		446	532	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	260	300	
Dual Operation					
Junction-to-Ambient Thermal Resistance <sup>1</sup>	$T \leq 10S$	$R_{\theta JA}$	310	360	°C / W
	Steady State		366	432	
Junction-to-Ambient Thermal Resistance <sup>2</sup>	$T \leq 10S$	$R_{\theta JA}$	415	486	
	Steady State		498	575	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	265	305	

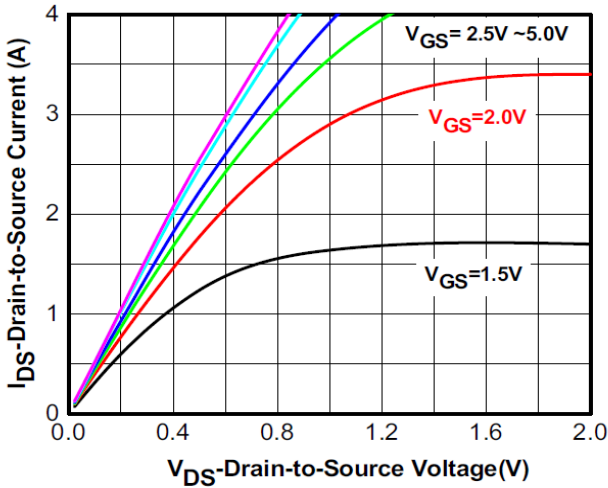
Note:

1. Surface mounted on FR4 Board using 1 square inch pad size, 1oz copper.
2. Surface mounted on FR4 board using minimum pad size, 1oz copper
3. Repetitive rating, pulse width limited by junction temperature,  $t_p=10\mu s$ , Duty Cycle=1%
4. Repetitive rating, pulse width limited by junction temperature  $T_J=150^\circ C$ .

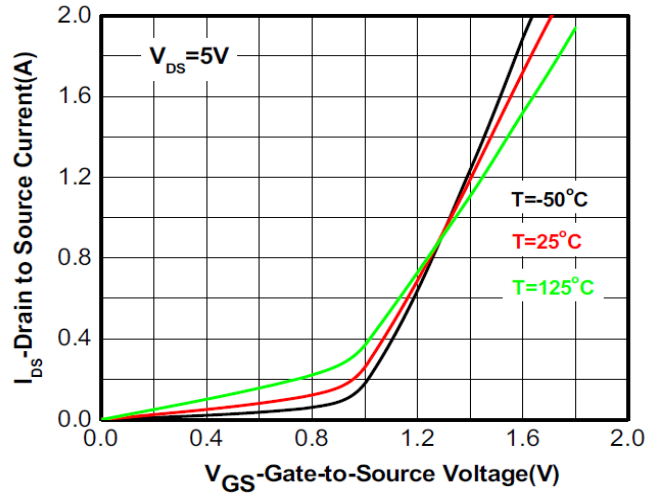
### ELECTRICAL CHARACTERISTICS ( $T_A=25^\circ C$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Teat Conditions
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	20	-	-	V	$V_{GS}=0, I_D=250\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	1	$\mu A$	$V_{DS}=16V, V_{GS}=0$
Gate-Source Leakage	$I_{GSS}$	-	-	$\pm 5$	$\mu A$	$V_{DS}=0, V_{GS}= \pm 5V$
Gate-Threshold Voltage	$V_{GS(TH)}$	0.45	0.58	0.85	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Drain-Source On Resistance	$R_{DS(ON)}$	-	220	310	m $\Omega$	$V_{GS}=4.5V, I_D=0.55A$
		-	260	360		$V_{GS}=2.5V, I_D=0.45A$
		-	320	460		$V_{GS}=1.8V, I_D=0.35A$
Forward Transconductance	$g_{FS}$	-	2	-	S	$V_{DS}=5V, I_D= 0.55A$
<b>Body-Drain Diode Ratings</b>						
Diode Forward On-Voltage	$V_{SD}$	0.5	0.7	1.5	V	$I_S=350mA, V_{GS}=0$
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{ISS}$	-	50	-	pF	$V_{DS}=10V,$ $V_{GS}=0,$ $f=100KHz$
Output Capacitance	$C_{OSS}$	-	13	-		
Reverse Transfer Capacitance	$C_{RSS}$	-	8	-		
Total Gate Charge	$Q_{G(TOT)}$	-	1.15	-	nC	$V_{DS}=10V,$ $V_{GS}=4.5V,$ $I_D=0.55A$
Threshold Gate Charge	$Q_{G(TH)}$	-	0.06	-		
Gate-to-Source Charge	$Q_{GS}$	-	0.15	-		
Gate-to-Drain Charge	$Q_{GD}$	-	0.23	-		
Turn-on Delay Time	$T_{d(ON)}$	-	22	-	nS	$V_{DD}=10V,$ $I_D=0.55A,$ $V_{GS}=4.5V,$ $R_G=6\Omega.$
Rise Time	$T_r$	-	80	-		
Turn-off Delay Time	$T_{d(OFF)}$	-	700	-		
Fall Time	$T_f$	-	380	-		

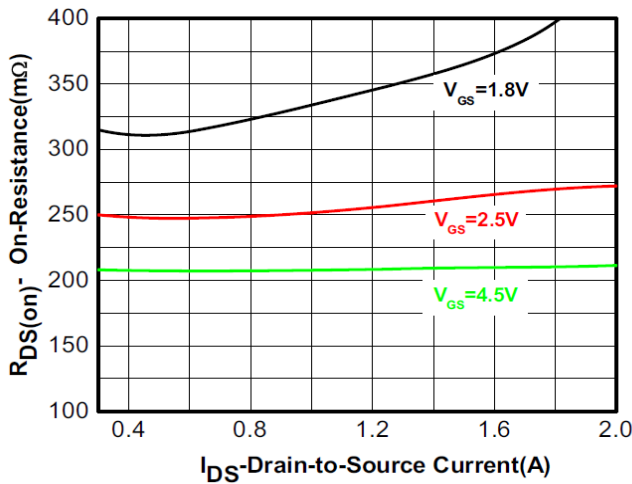
**CHARACTERISTIC CURVES**



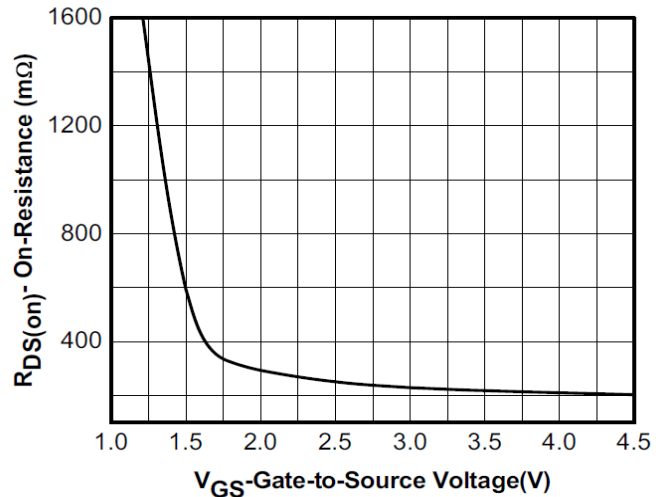
Output characteristics



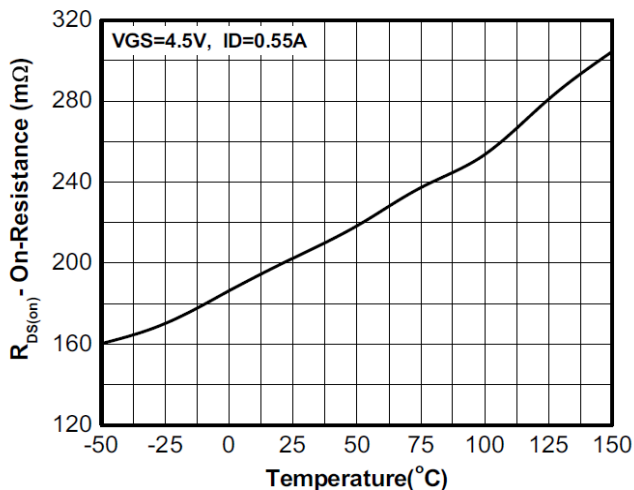
Transfer characteristics



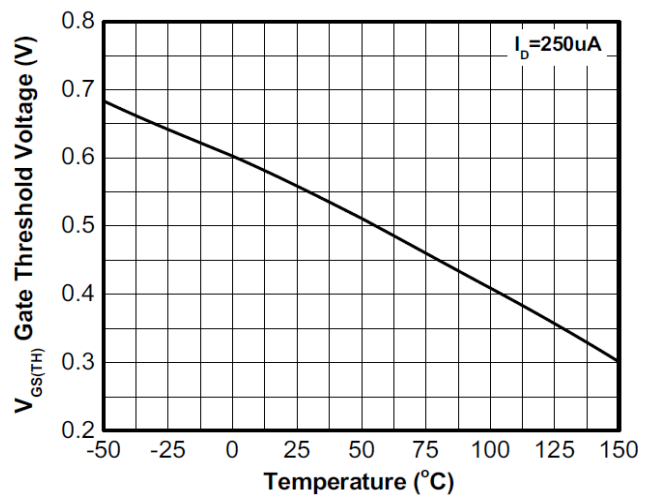
On-Resistance vs. Drain current



On-Resistance vs. Gate-to-Source voltage



On-Resistance vs. Junction temperature



Threshold voltage vs. Temperature

**CHARACTERISTIC CURVES**

