

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

MECHANICAL DATA

- High Density Cell Design for Low $R_{DS(ON)}$
- High Speed Switching
- Interfacing, Logic Switch
- Load Switch
- Power Management

SOT-363



MARKING

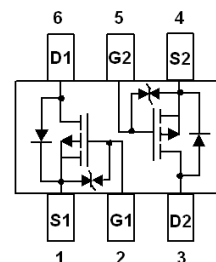
39KA

PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-363	3K	7 inch

ORDER INFORMATION

Part Number	Type
SUM3139K-C	Lead (Pb)-free and Halogen-free



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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current	I_D	$T_A=25^\circ\text{C}$	-0.5
		$T_A=70^\circ\text{C}$	-0.4
Pulsed Drain Current ¹	I_{DM}	-2.6	A
Total Power Dissipation @ Steady State	P_D	150	mW
Thermal Resistance from Junction-Ambient ² @ Steady State	$R_{\theta JA}$	833	$^\circ\text{C/W}$
Junction & Storage Temperature Range	T_J, T_{STG}	-55~150	$^\circ\text{C}$

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-20	-	-	V	$V_{GS}=0, I_D = -250\mu\text{A}$
Gate-Threshold Voltage	$V_{GS(th)}$	-0.35	-0.62	-1.2		$V_{DS}=V_{GS}, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	-1	μA	$V_{DS} = -20, V_{GS} = 0, T_C = 25^{\circ}\text{C}$
Gate-Body Leakage Current	I_{GSS}	-	± 1.5	± 10	μA	$V_{DS} = 0, V_{GS} = \pm 10\text{V}$
		-	± 0.5	± 2		$V_{DS} = 0, V_{GS} = \pm 8\text{V}$
Static Drain-Source On Resistance	$R_{DS(on)}$	-	0.58	0.85	Ω	$V_{GS} = -4.5\text{V}, I_D = -0.5\text{A}$
		-	0.855	1.2		$V_{GS} = -2.5\text{V}, I_D = -0.3\text{A}$
		-	1.35	2		$V_{GS} = -1.8\text{V}, I_D = -0.2\text{A}$
Total Gate Charge	Q_g	-	1.24	-	nC	$V_{GS} = -4.5\text{V}$ $V_{DD} = -10\text{V}$ $I_D = -0.5\text{A}$
Gate Source Charge	Q_{gs}	-	0.37	-		
Gate Drain Charge	Q_{gd}	-	0.27	-		
Turn-on Delay Time	$T_{d(on)}$	-	4	-	nS	$V_{GS} = -4.5\text{V}$ $V_{DD} = -10\text{V}$ $R_L = 2.5\Omega$ $R_{GEN} = 3\Omega$
Rise Time	T_r	-	19	-		
Turn-off Delay Time	$T_{d(off)}$	-	16	-		
Fall Time	T_f	-	25	-		
Input Capacitance	C_{iss}	-	71	-	pF	$V_{DS} = -10\text{V}$ $V_{GS} = 0$ $f = 1\text{MHz}$
Output Capacitance	C_{oss}	-	20	-		
Reverse Transfer Capacitance	C_{rss}	-	15	-		
Source-Drain Diode						
Diode Forward Voltage	V_{SD}	-	-0.8	-1.2	V	$I_S = -0.5\text{A}, V_{GS} = 0$
Maximum Body-Diode Continuous Current	I_S	-	-	-0.5	A	
Reverse Recovery Time	T_{rr}	-	26	-	nS	$I_F = -0.5\text{A}, di/dt = -20\text{A}/\mu\text{s}$
Reverse Recovery Charge	Q_{rr}	-	0.97	-	nC	

Notes:

1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
2. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

CHARACTERISTIC CURVES

Figure 1. Output Characteristics

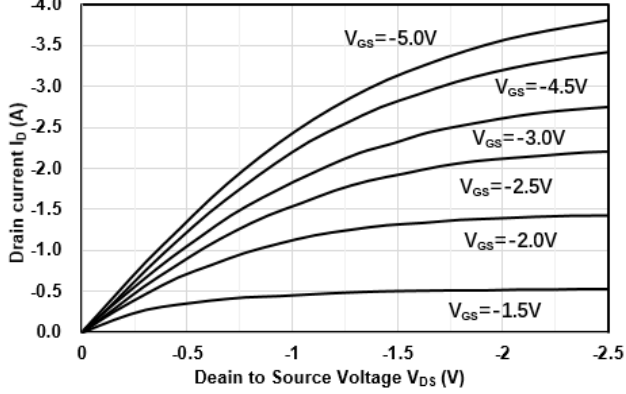


Figure 2. Transfer Characteristics

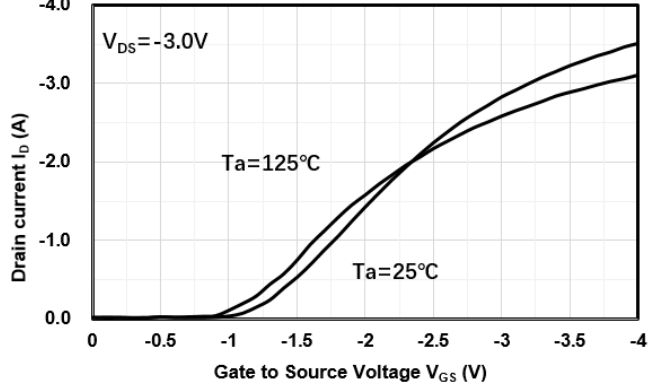


Figure 3. Capacitance Characteristics

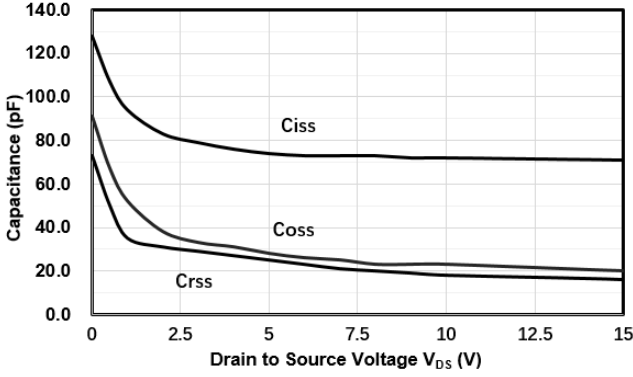


Figure 4. Gate Charge

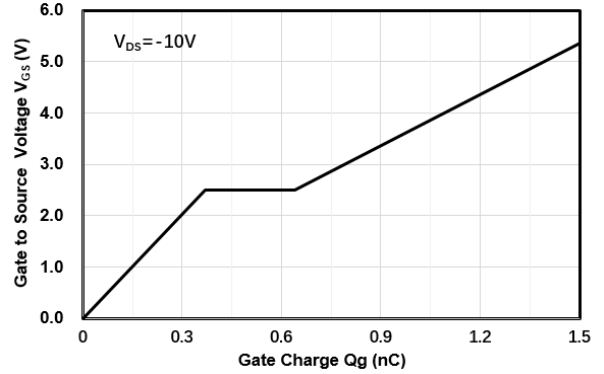


Figure 5. Drain-Source on Resistance

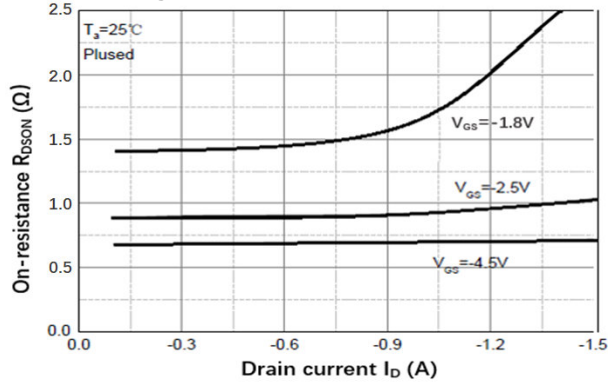


Figure 6. Drain-Source on Resistance

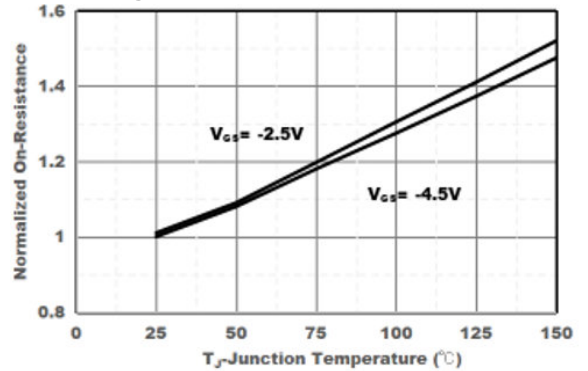


Figure 7. Safe Operation Area

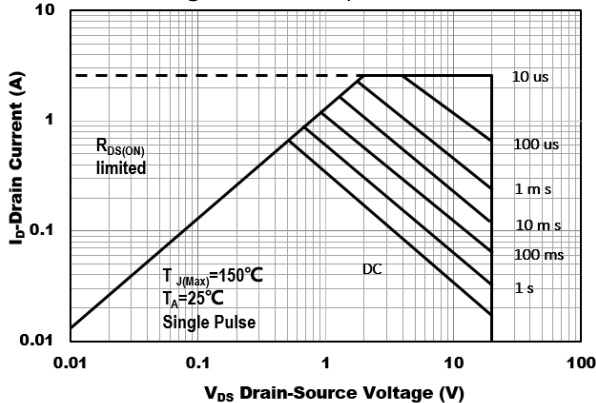
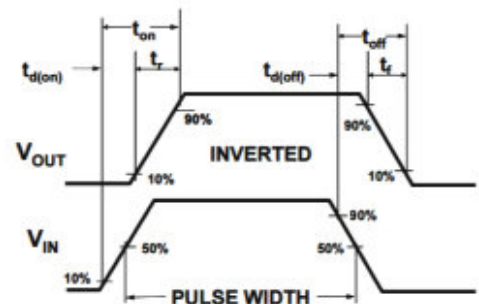
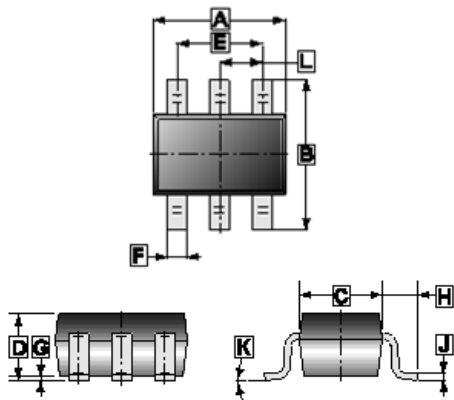


Figure 8. Switching Wave



PACKAGE OUTLINE DIMENSIONS

SOT-363



REF.	Millimeter	
	Min.	Max.
A	1.80	2.20
B	1.80	2.45
C	1.15	1.35
D	0.70	1.10
E	1.30 REF.	
F	0.10	0.35
G	0.10 REF.	
H	0.525 REF.	
J	0.05	0.25
K	8°	
L	0.65 TYP.	

MOUNTING PAD LAYOUT

SOT-363

