

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

DESCRIPTION

The SUM138DW-C is the highest performance trench Dual N-Ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The SUM138DW-C meet the RoHS and Green Product requirement with full function reliability approved.

FEATURES

- Advanced High Cell Density Trench Technology
- Super Low Gate Charge
- Green Device Available

MARKING

SS

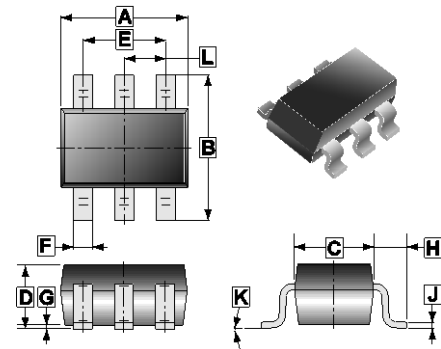
PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-363	3K	7 inch

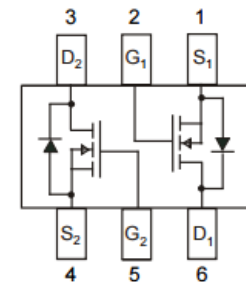
ORDER INFORMATION

Part Number	Type
SUM138DW-C	Lead (Pb)-free and Halogen-free

SOT-363



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



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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	50	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current @ $V_{GS}=10\text{V}$	I_D	$T_A=25^\circ\text{C}$	0.34
		$T_A=70^\circ\text{C}$	0.272
Pulsed Drain Current ¹	I_{DM}	1.5	A
Total Power Dissipation	P_D	0.35	W
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55~150	$^\circ\text{C}$
Thermal Data			
Thermal Resistance Junction-Ambient ²	$R_{\theta JA}$	357	$^\circ\text{C/W}$

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	50	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$
Gate Threshold Voltage	$V_{GS(th)}$	0.8	-	1.6	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 20\text{V}$
Drain-Source Leakage Current	I_{DSS}	-	-	1	μA	$V_{DS}=50\text{V}, V_{GS}=0$
Static Drain-Source On-Resistance ⁴	$R_{DS(ON)}$	-	-	2.5	Ω	$V_{GS}=10\text{V}, I_D=300\text{mA}$
		-	-	3		$V_{GS}=4.5\text{V}, I_D=200\text{mA}$
Total Gate Charge	Q_g	-	1.7	-	nC	$I_D=300\text{mA}$ $V_{DS}=25\text{V}$ $V_{GS}=10\text{V}$
Gate-Source Charge	Q_{gs}	-	0.4	-		
Gate-Drain Charge	Q_{gd}	-	0.24	-		
Turn-on Delay Time	$T_{d(on)}$	-	2.6	-	nS	$V_{DD}=25\text{V}$ $I_D=300\text{mA}$ $V_{GS}=10\text{V}$ $R_G=6\Omega$
Rise Time	T_r	-	18.8	-		
Turn-off Delay Time	$T_{d(off)}$	-	9.7	-		
Fall Time	T_f	-	47	-		
Input Capacitance	C_{iss}	-	28.5	-	pF	$V_{GS}=0$ $V_{DS}=25\text{V}$ $f=1\text{MHz}$
Output Capacitance	C_{oss}	-	2.7	-		
Reverse Transfer Capacitance	C_{rss}	-	1.78	-		
Source-Drain Diode						
Diode Forward Voltage	V_{SD}	-	-	1.2	V	$V_{GS}=0, I_S=300\text{mA}$
Continuous Source Current	I_S	-	-	340	mA	
Reverse Recovery Charge	Q_{rr}	-	2.65	-	nC	$I_F=300\text{mA}, di/dt=100\text{A}/\mu\text{s}$
Reverse Recovery Time	T_{rr}	-	12.2	-	nS	

Notes:

- The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- Surface mounted on FR-4 Board using the minimum recommended pad size.

CHARACTERISTIC CURVES

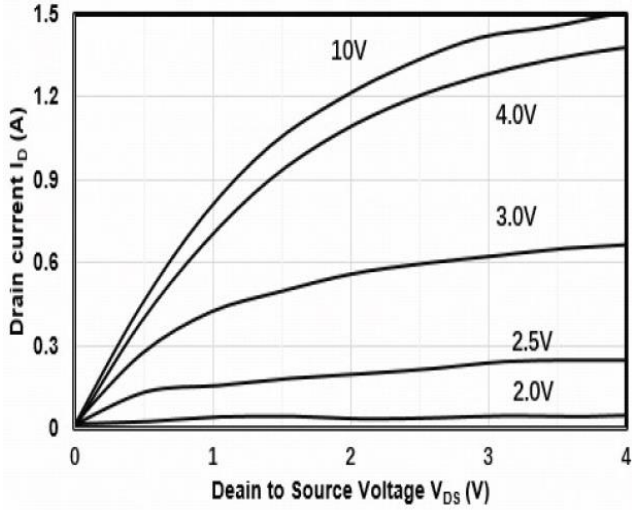


Figure1. Output Characteristics

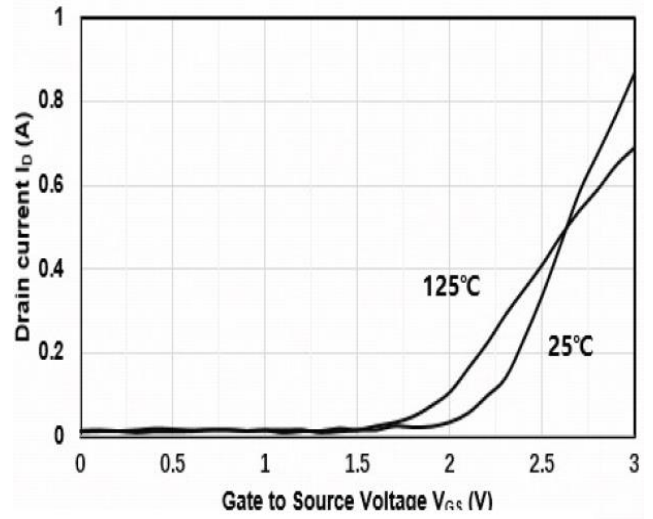


Figure2. Transfer Characteristics

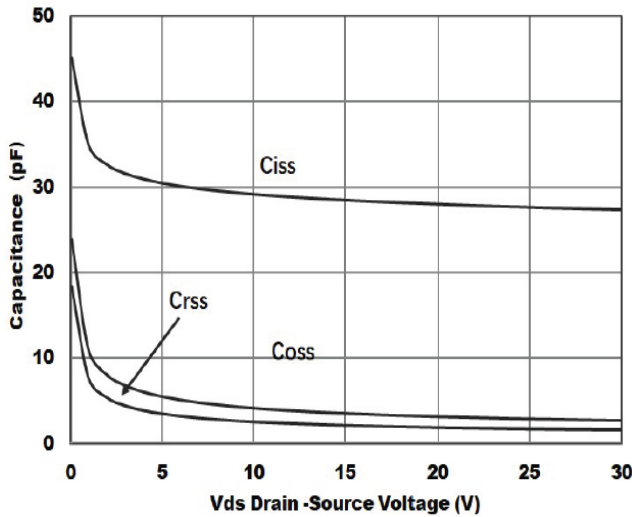


Figure3. Capacitance Characteristics

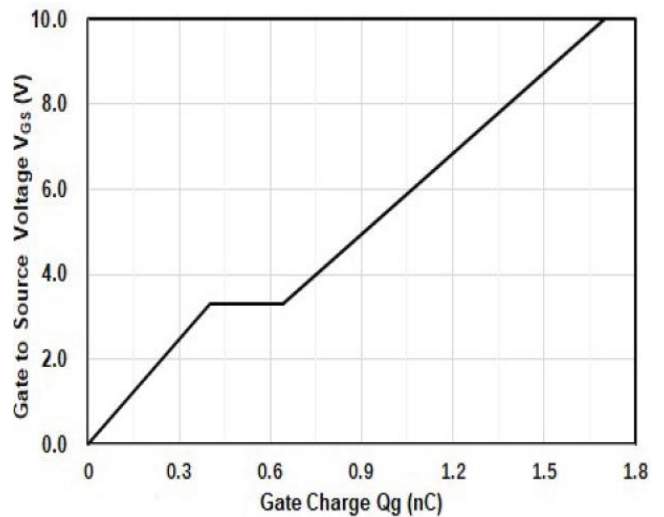


Figure4. Gate Charge

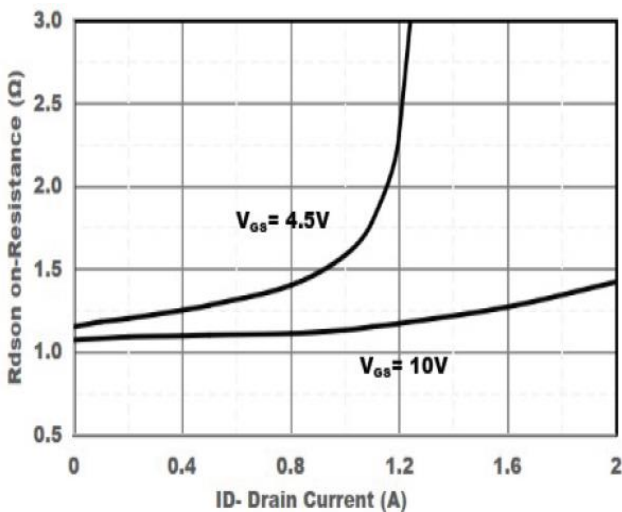


Figure5. Drain-Source on Resistance

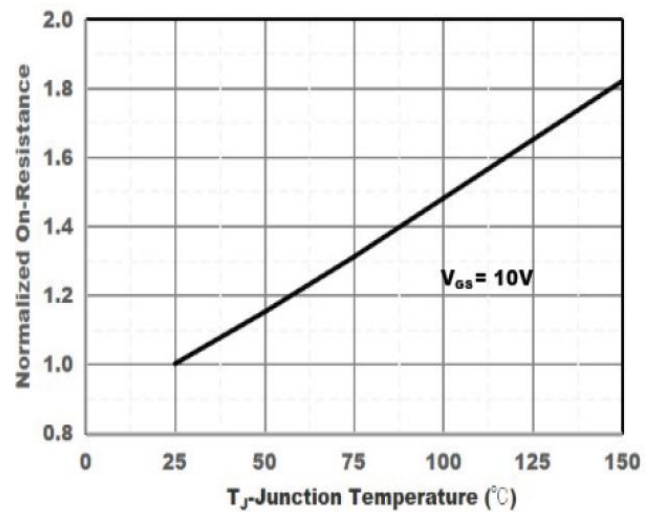


Figure6. Drain-Source on Resistance

CHARACTERISTIC CURVES

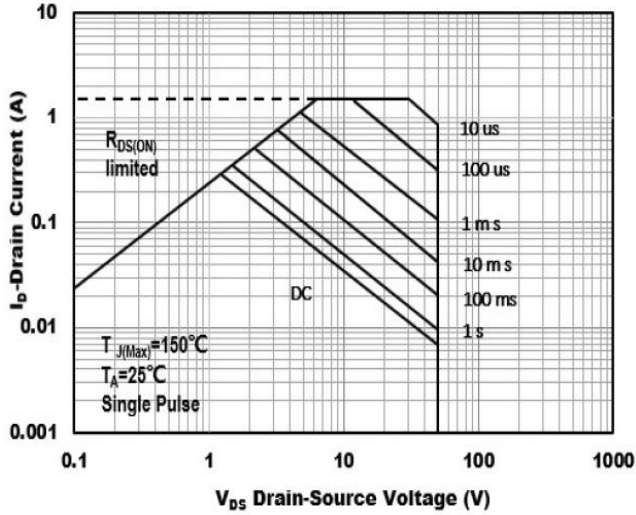


Figure7. Safe Operation Area

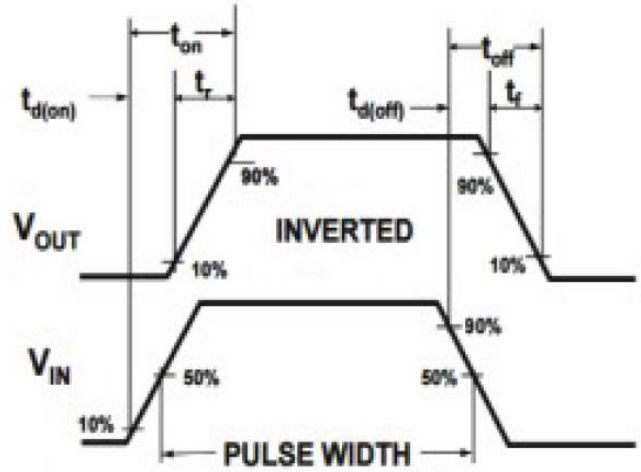


Figure8. Switching wave

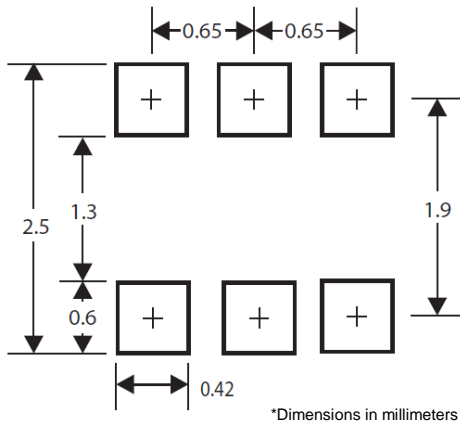


Figure9. Mounting Pad Layout