

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

DESCRIPTION

The SSM0410-C is the highest performance trench 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 SSM0410-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



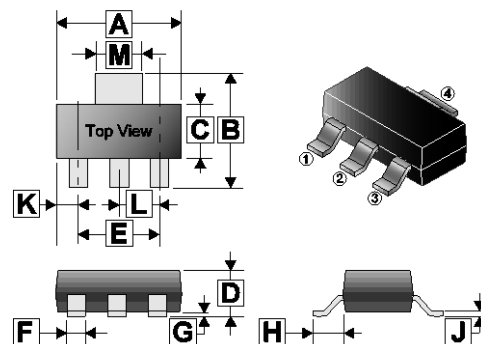
PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-223	2.5K	13 inch

ORDER INFORMATION

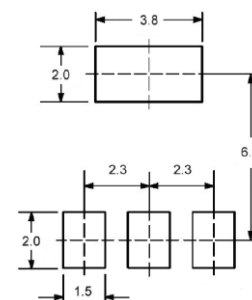
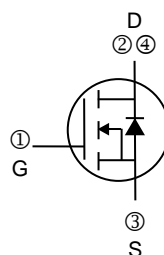
Part Number	Type
SSM0410-C	Lead (Pb)-free and Halogen-free

SOT-223



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.90	6.70	G	-	0.18
B	6.70	7.30	H	2.00	REF.
C	3.30	3.80	J	0.20	0.40
D	1.40	1.90	K	1.10	REF.
E	4.45	4.75	L	2.30	REF.
F	0.60	0.85	M	2.80	3.20

Mounting Pad Layout



*Dimensions in millimeters

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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹ @ $V_{GS}=10\text{V}$	I_D	$T_C=25^\circ\text{C}$	6
		$T_A=25^\circ\text{C}$	3.5
		$T_A=70^\circ\text{C}$	2.8
Pulsed Drain Current ³	I_{DM}	14	A
Total Power Dissipation	P_D	2.5	W
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55~150	$^\circ\text{C}$
Thermal Data			
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	$t \leq 10\text{sec}, 50$	$^\circ\text{C/W}$
		Steady State, 85	
Thermal Resistance Junction-Ambient ²	$R_{\theta JA}$	120	
Thermal Resistance Junction-Case ¹	$R_{\theta JC}$	30	

ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV _{DSS}	100	-	-	V	V _{GS} =0, I _D =250uA
Gate Threshold Voltage	V _{GS(th)}	1	-	2.5	V	V _{DS} =V _{GS} , I _D =250uA
Forward Transfer Conductance	g _{fs}	-	4	-	S	V _{DS} =5V, I _D =2A
Gate-Source Leakage Current	I _{GSS}	-	-	±100	nA	V _{GS} = ±20V
Drain-Source Leakage Current	I _{DSS}	-	-	1	μA	V _{DS} =80V, V _{GS} =0, T _J =25°C
		-	-	10		V _{DS} =80V, V _{GS} =0, T _J =55°C
Drain-Source on Resistance ⁴	R _{DS(ON)}	-	-	148	mΩ	V _{GS} =10V, I _D =2.6A
		-	-	150		V _{GS} =4.5V, I _D =1.7A
Total Gate Charge	Q _g	-	20	-	nC	V _{GS} =10V V _{DS} =50V I _D =6A
Gate-Source Charge	Q _{gs}	-	4	-		
Gate-Drain Charge	Q _{gd}	-	5	-		
Turn-on Delay Time	T _{d(on)}	-	17.3	-	nS	V _{DD} =50V V _{GS} =10V I _D =1A R _G =3.3Ω R _L =50Ω
Rise Time	T _r	-	2.8	-		
Turn-off Delay Time	T _{d(off)}	-	50	-		
Fall Time	T _f	-	2.8	-		
Input Capacitance	C _{iss}	-	1077	-	pF	V _{DS} =15V V _{GS} =0 f=1MHz
Output Capacitance	C _{oss}	-	46	-		
Reverse Transfer Capacitance	C _{rss}	-	32	-		
Source-Drain Diode						
Continuous Source Current ¹	I _S	-	-	3.5	A	
Pulsed Source Current ³	I _{SM}	-	-	14		
Diode Forward Voltage ⁴	V _{SD}	-	-	1.2	V	I _S =1A, V _{GS} =0
Reverse Recovery Time	t _{rr}	-	26	-	nS	I _F =6A, dI/dt=100A/μs
Reverse Recovery Charge	Q _{rr}	-	15	-	nC	T _J =25°C

Notes:

1. Surface mounted on a 1 inch² FR-4 board with 2oz copper.
2. When mounted on Min. copper pad.
3. Pulse width limited by Max. junction temperature.
4. Pulse width ≤ 300us, duty cycle ≤ 2%.

CHARACTERISTIC CURVES

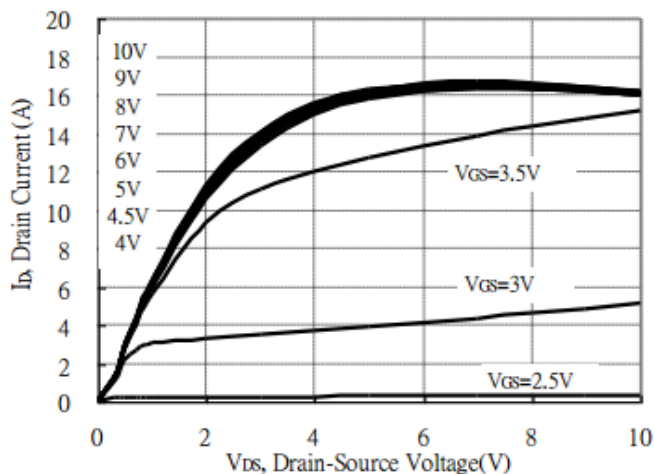


Fig.1 Typical Output Characteristics

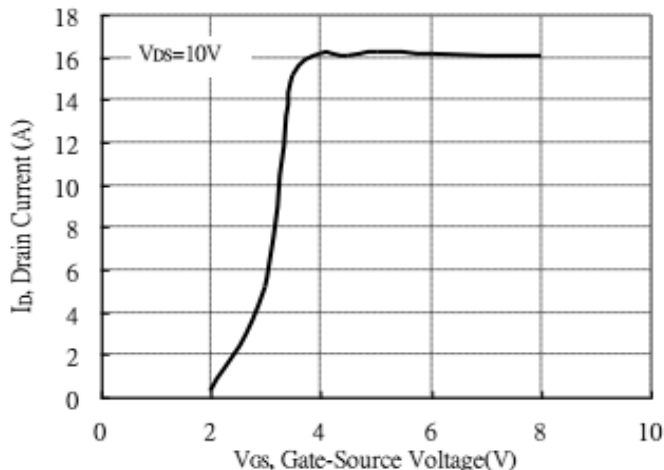


Fig.2 Typical Transfer Characteristics

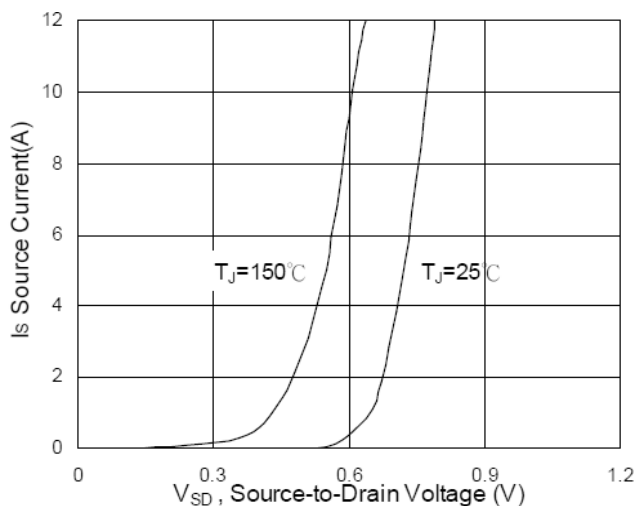


Fig.3 Forward Characteristics Of Reverse

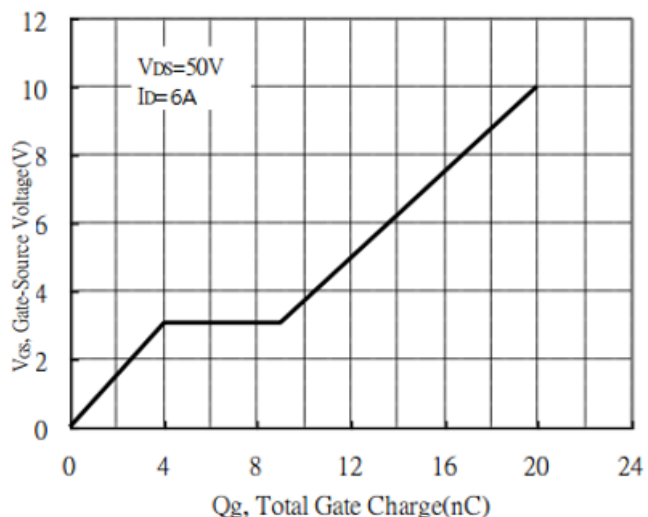


Fig.4 Gate-Charge Characteristics

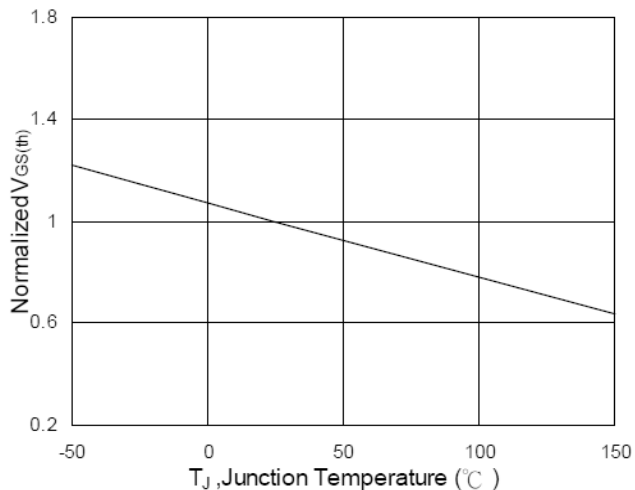


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

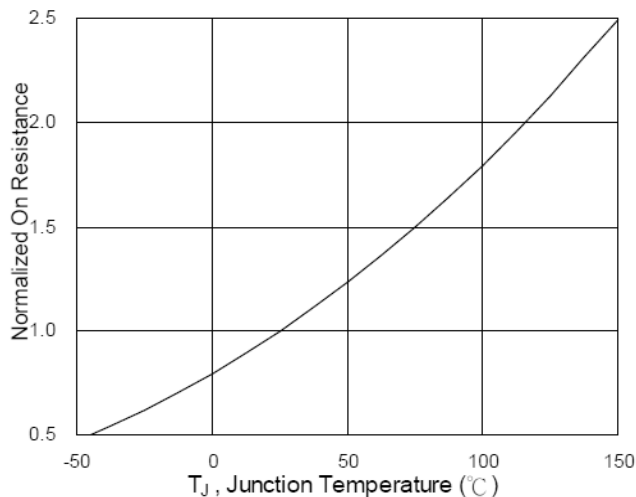


Fig.6 Normalized $R_{DS(ON)}$ vs. T_J

CHARACTERISTIC CURVES

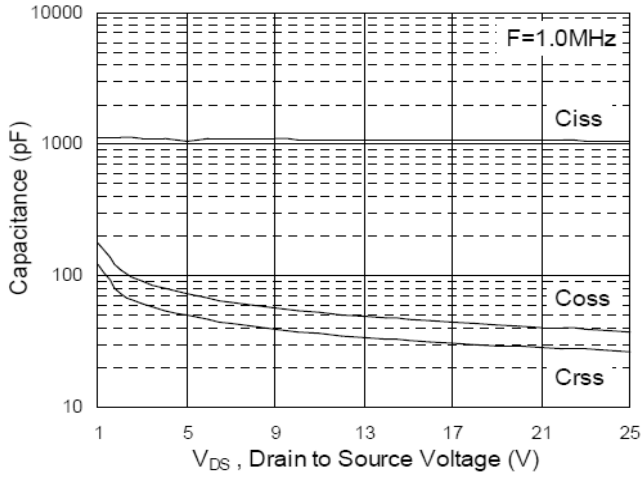


Fig.7 Capacitance

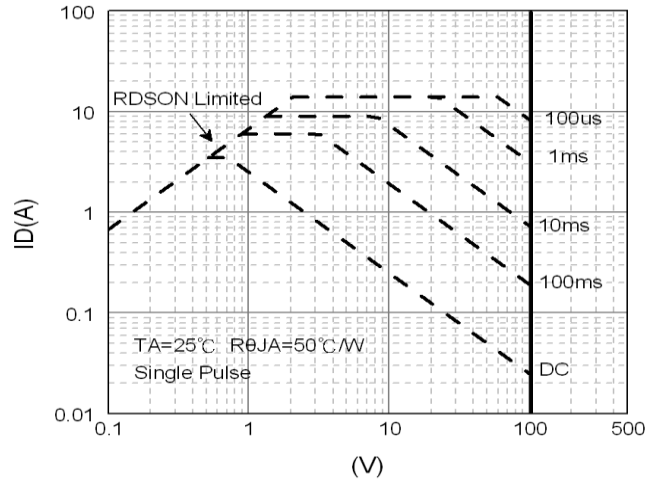


Fig.8 Safe Operating Area

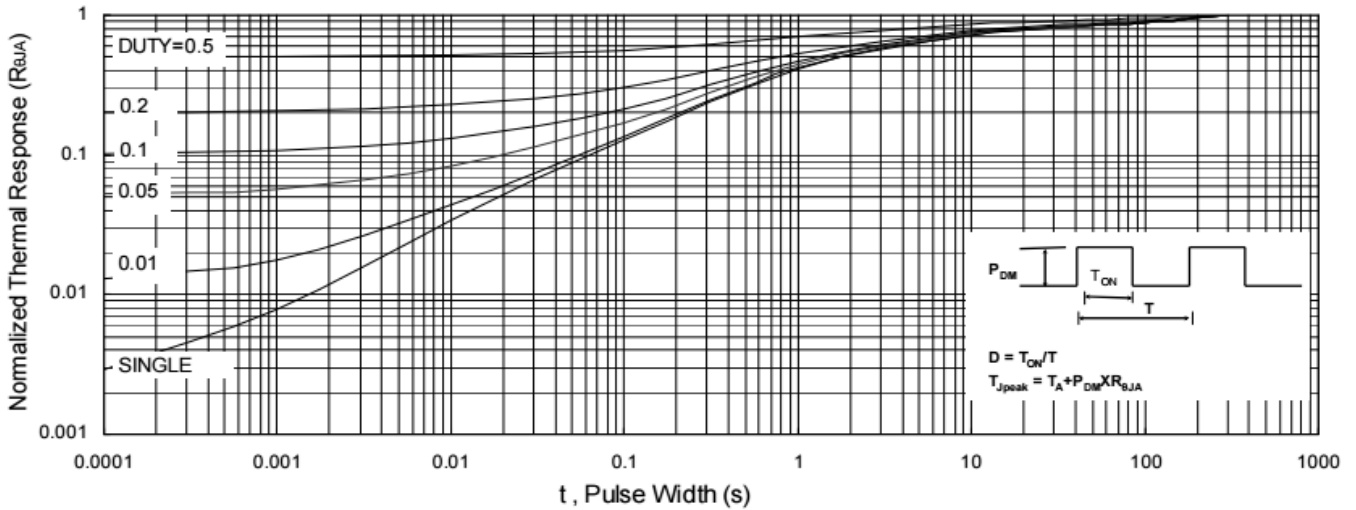


Fig.9 Normalized Maximum Transient Thermal Impedance

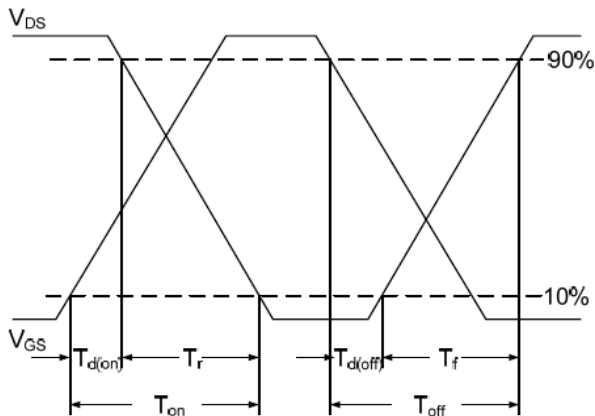


Fig.10 Switching Time Waveform

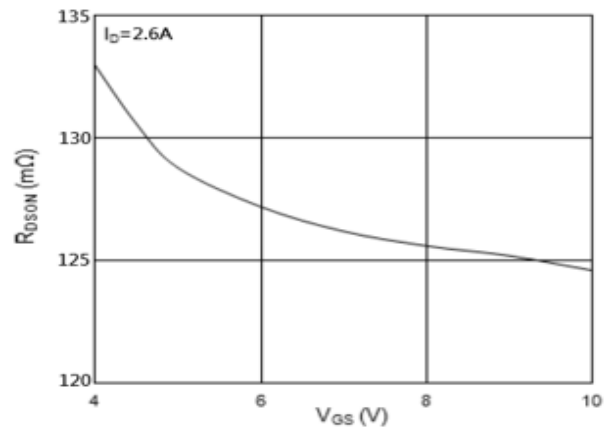


Fig.11 On-Resistance vs. Gate-Source