Elektronische Bauelemente

SMS2012-C

6A, 20V, $R_{DS(ON)}$ 26mΩ
N-Ch Enhancement Mode Power MOSFET

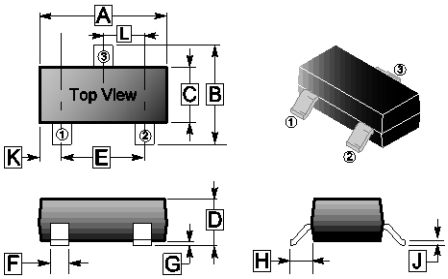
RoHS Compliant Product
A Suffix of "-C" specifies halogen & lead-free

DESCRIPTION

The SMS2012-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 small power switching and load switch applications.

The SMS2012-C meet the RoHS and Green Product Requirement with full function reliability approved.

SOT-23



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.65	3.10	G	0	0.18
B	2.10	3.00	H	0.55 REF.	
C	1.10	1.80	J	0.08	0.26
D	0.89	1.40	K	0.60 REF.	
E	1.70	2.30	L	0.95 TYP.	
F	0.28	0.55			

FEATURES

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

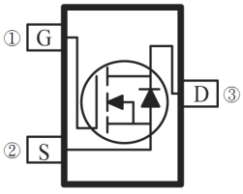
MARKING

2012

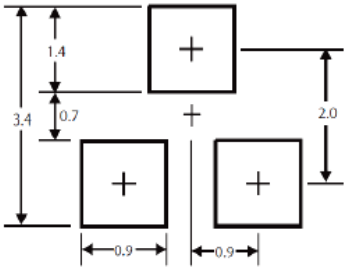
F□□ ← □ = Date code

PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch



Mounting Pad Layout



*Dimensions in millimeters

ORDER INFORMATION

Part Number	Type
SMS2012-C	Lead (Pb)-free and Halogen-free

MAXIMUM RATINGS

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current @V_{GS}=4.5V [1]	T_A=25°C	I_D	6	A
	T_A=70°C		5	
Pulsed Drain Current [2]		I_{DM}	17	A
Power Dissipation [3]	T_A=25°C	P_D	1	W
	T_A=70°C		0.66	
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~150	°C
Thermal Resistance Ratings				
Thermal Resistance from Junction-Ambient [1]		$R_{\theta JA}$	120	°C/W

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

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		BV_{DSS}	20	-	-	V	V_{GS}=0, I_D=250μA
Gate-Threshold Voltage		$V_{GS(th)}$	0.45	-	1	V	V_{DS}=V_{GS}, I_D=250μA
Forward Transconductance		g_{fs}	-	30	-	S	V_{DS}=5V, I_D=4A
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}= ±12V, V_{DS}=0
Drain-Source Leakage Current	T_J=25°C	I_{DSS}	-	-	1	μA	V_{DS}=16V, V_{GS}=0
	T_J=55°C		-	-	5		
Static Drain-Source On-Resistance [2]		$R_{DS(ON)}$	-	19	26	mΩ	V_{GS}=4.5V, I_D=4A
			-	23	35		V_{GS}=2.5V, I_D=3A
			-	34	50		V_{GS}=1.8V, I_D=2A
Total Gate Charge		Q_g	-	8.45	-	nC	I_D=4A V_{DS}=15V V_{GS}=4.5V
Gate-Source Charge		Q_{gs}	-	1.46	-		
Gate-Drain Charge		Q_{gd}	-	2.9	-		
Turn-on Delay Time		$T_{d(on)}$	-	6.4	-	nS	V_{DS}=10V I_D=4A V_{GS}=4.5V R_G=3.3Ω
Rise Time		T_r	-	18.2	-		
Turn-off Delay Time		$T_{d(off)}$	-	22.4	-		
Fall Time		T_f	-	19.1	-		
Input Capacitance		C_{iss}	-	570	-	pF	V_{GS}=0 V_{DS}=15V f=1MHz
Output Capacitance		C_{oss}	-	85	-		
Reverse Transfer Capacitance		C_{rss}	-	64	-		
Source-Drain Diode							
Forward on Voltage [2]		V_{SD}	-	-	1.2	V	I_S=1A, V_{GS}=0, T_J=25°C
Continuous Source Current [1,4]		I_S	-	-	6	A	V_G=V_D=0V, Force Current

Notes:
1. The data tested by surface mounted on 1inch^2 FR-4 Board with 2oz copper.
2. The data tested by pulsed, Pulse Width≦300μs, Duty Cycle≦2%.
3. The power dissipation is limited by 150°C junction temperature.
4. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

CHARACTERISTIC CURVES

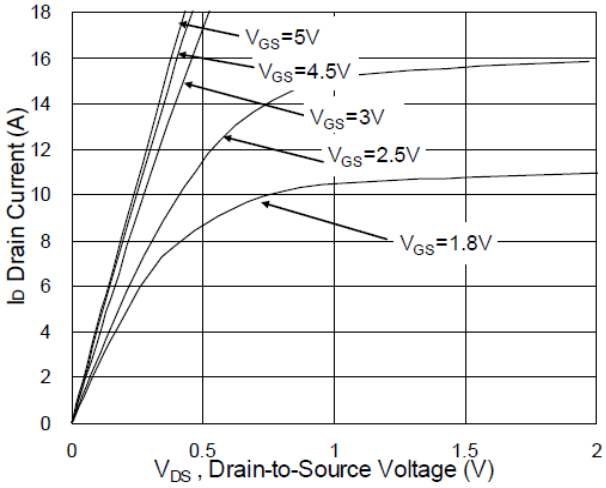


Fig.1 Typical Output Characteristics

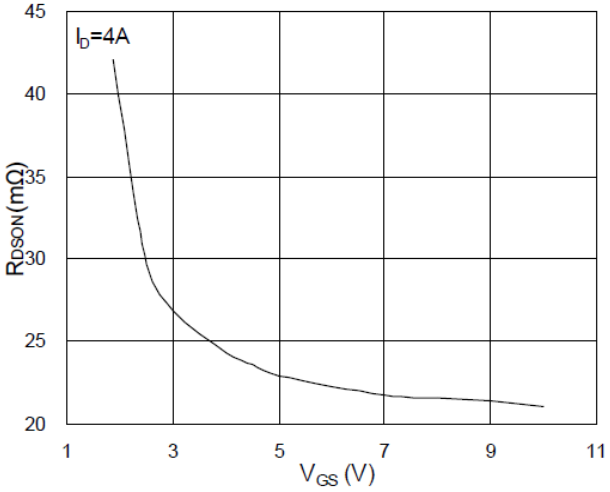


Fig.2 On-Resistance vs. Gate-Source

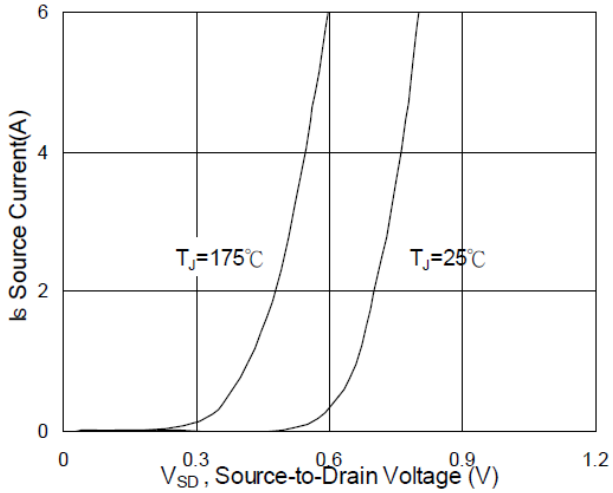


Fig.3 Forward Characteristics Of Reverse

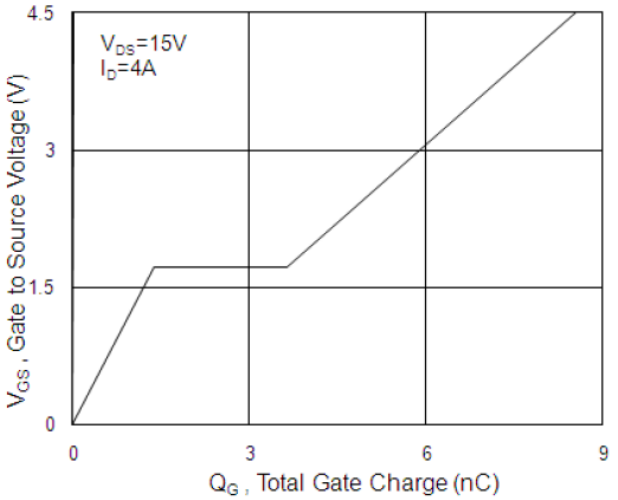


Fig.4 Gate-Charge Characteristics

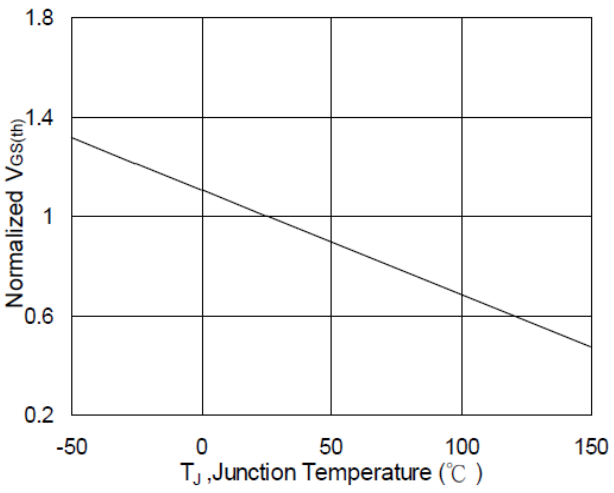


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

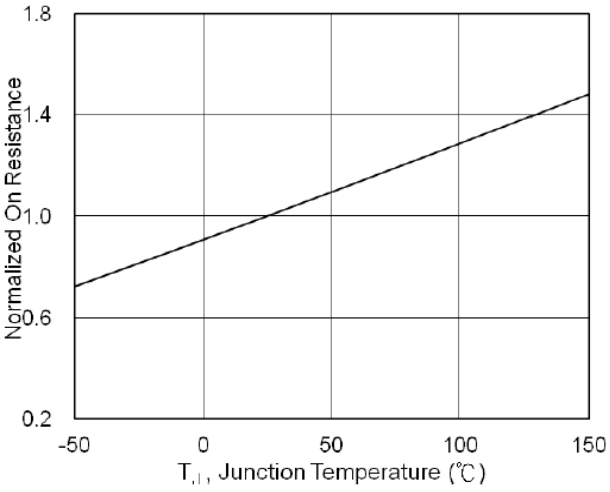


Fig.6 Normalized R_{DSON} vs. T_J

CHARACTERISTIC CURVES

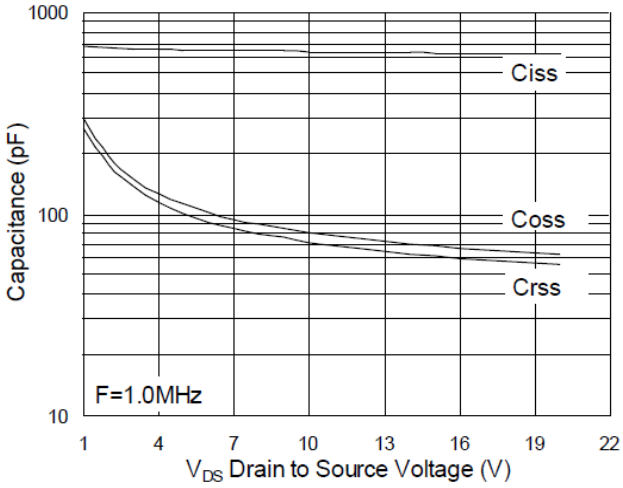


Fig.7 Capacitance

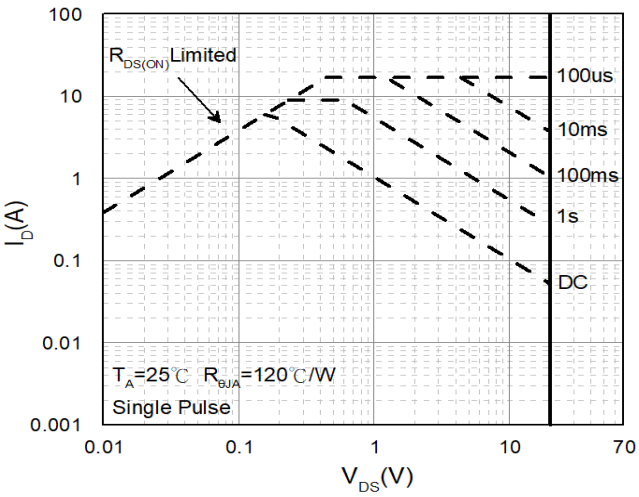


Fig.8 Safe Operating Area

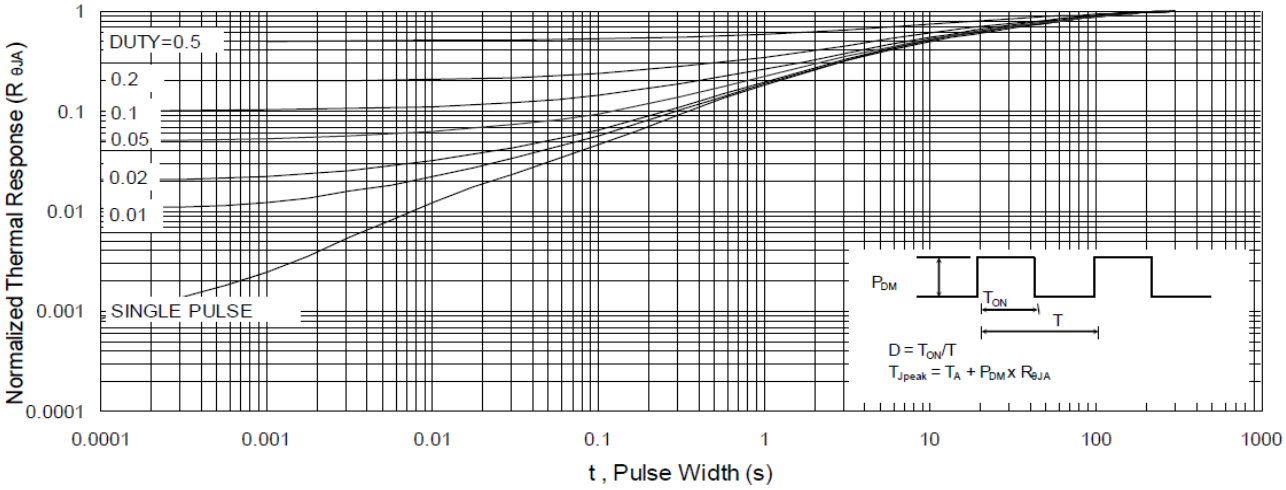


Fig.9 Normalized Maximum Transient Thermal Impedance

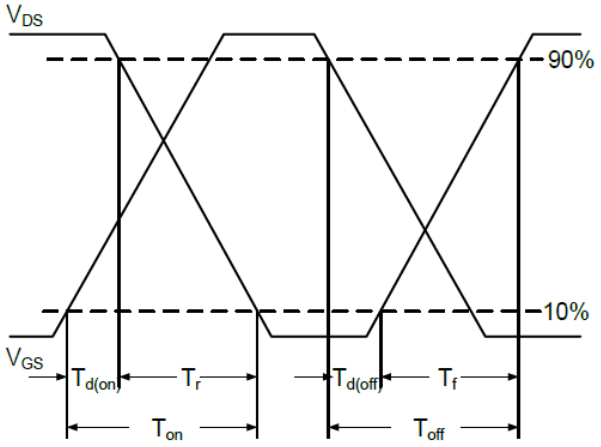


Fig.10 Switching Time Waveform

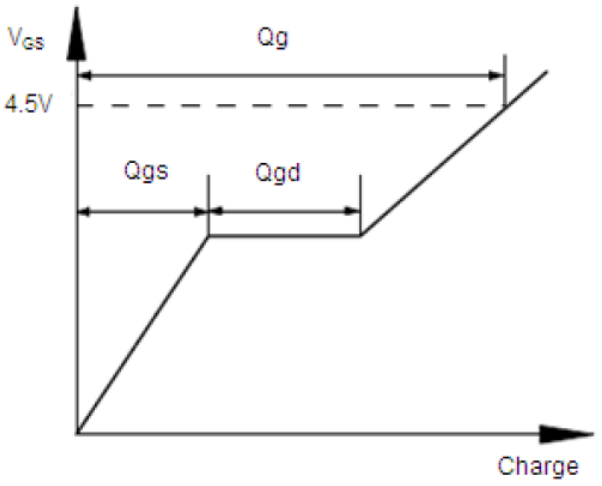


Fig.11 Gate Charge Waveform