

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

## DESCRIPTION

These miniature surface mount MOSFETs reduce power loss conserve energy, making this device ideal for use in small power management circuitry.

## FEATURES

- Energy Efficient
- Low Threshold Voltage
- High-Speed Switching
- Miniature Surface Mount Package Saves Board Space

## MARKING

B84

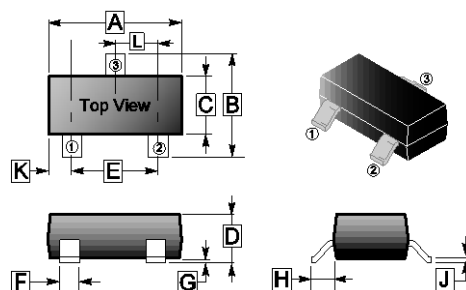
## PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch

## ORDER INFORMATION

Part Number	Type
SMS840J-C	Lead (Pb)-free and Halogen-free

## 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	0.05	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			

## MARKING

B84

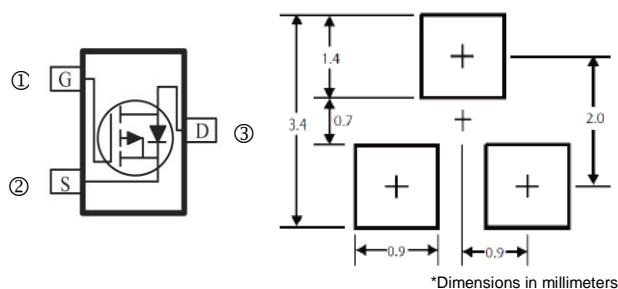
## PACKAGE INFORMATION

Package	MPQ	Leader Size
SOT-23	3K	7 inch

## ORDER INFORMATION

Part Number	Type
SMS840J-C	Lead (Pb)-free and Halogen-free

## Mounting Pad Layout



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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-50	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	-0.13	A
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	-0.52	A
Power Dissipation	$P_D$	225	mW
Lead Temperature for Soldering Purposes (1/8" from case for 5s)	$T_L$	260	$^\circ\text{C}$
Operating Junction & Storage Temperature	$T_J, T_{STG}$	150, -55~150	$^\circ\text{C}$
Thermal Resistance Ratings			
Thermal Resistance Junction-Ambient <sup>2</sup>	$R_{\theta JA}$	556	$^\circ\text{C/W}$

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

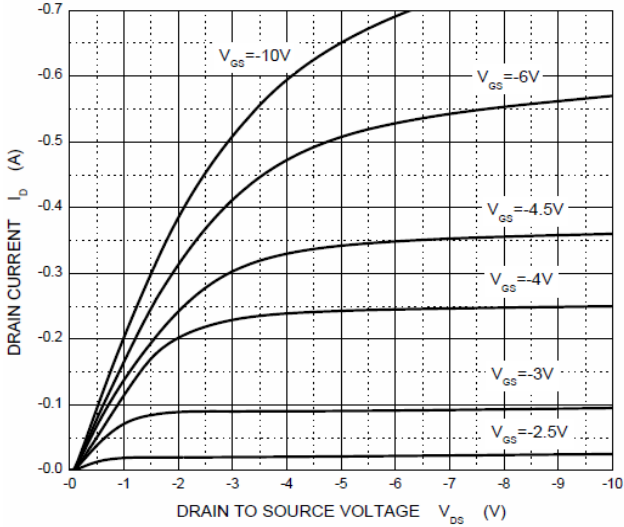
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	-50	-	-	V	$V_{GS}=0V, I_D = -250\mu A$
Drain-Source Leakage Current	$I_{GSS}$	-	-	$\pm 5$	$\mu A$	$V_{DS}=0V, V_{GS} = \pm 20V$
Gate-Source Leakage Current	$I_{DSS}$	-	-	-15	$\mu A$	$V_{GS}=0V, V_{DS} = -50V$
		-	-	-0.1		$V_{GS}= 0V, V_{DS} = -25V$
Gate-Threshold Voltage <sup>3</sup>	$V_{GS(th)}$	-0.9	-1.6	-2	V	$V_{DS}=V_{GS}, I_D = -250\mu A$
Forward Transconductance <sup>1</sup>	$g_{fs}$	50	-	-	mS	$V_{DS} = -25V, I_D = -100mA$
Static Drain-Source On-Resistance <sup>3</sup>	$R_{DS(ON)}$	-	5.8	10	$\Omega$	$V_{GS} = -5V, I_D = -0.1A$
		-	4.5	8		$V_{GS} = -10V, I_D = 0.1A$
Total Gate Charge	$Q_g$	-	1.58	-	nC	$I_D = -0.13A$ $V_{DS} = -30V$ $V_{GS} = -10V$
Gate-Source Charge	$Q_{gs}$	-	0.48	-		
Gate-Drain Charge	$Q_{gd}$	-	0.22	-		
Turn-on Delay Time	$T_{d(on)}$	-	1.8	-	nS	$V_{DD} = -15V$ $V_{GS} = 10V$ $R_G = 50\Omega$ $I_D = -0.13A$
Rise Time	$T_r$	-	18.4	-		
Turn-off Delay Time	$T_{d(off)}$	-	15.6	-		
Fall Time	$T_f$	-	46.2	-		
Input Capacitance	$C_{iss}$	-	38	-	pF	$V_{GS}=0V$ $V_{DS} = -15V$ $f=1MHz$
Output Capacitance	$C_{oss}$	-	13	-		
Reverse Transfer Capacitance	$C_{rss}$	-	1.3	-		
<b>Source-Drain Diode</b>						
Continuous Current	$I_S$	-	-	-0.13	A	
Pulsed Current	$I_{SM}$	-	-	-0.52	A	
Diode Forward Voltage <sup>3</sup>	$V_{SD}$	-	-	-2.2	V	$I_S = -0.13A, V_{GS} = 0V$

Notes:

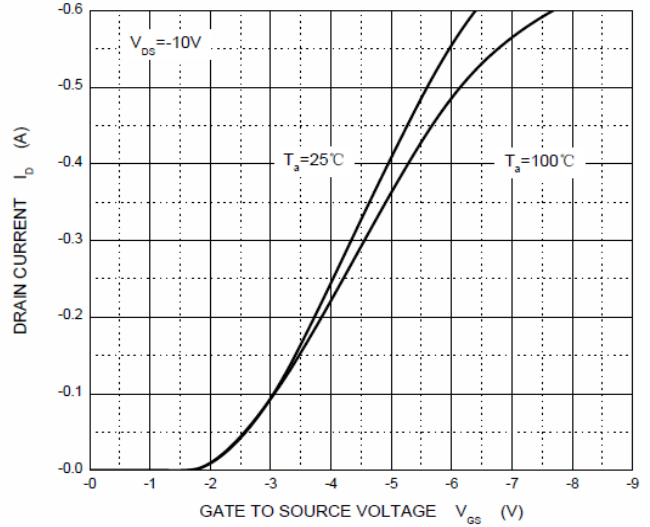
1. Repetitive rating: Pulse width limited by junction temperature.
2. Surface mounted on FR-4 board  $t \leq 10s$ .
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .

**CHARACTERISTIC CURVES**

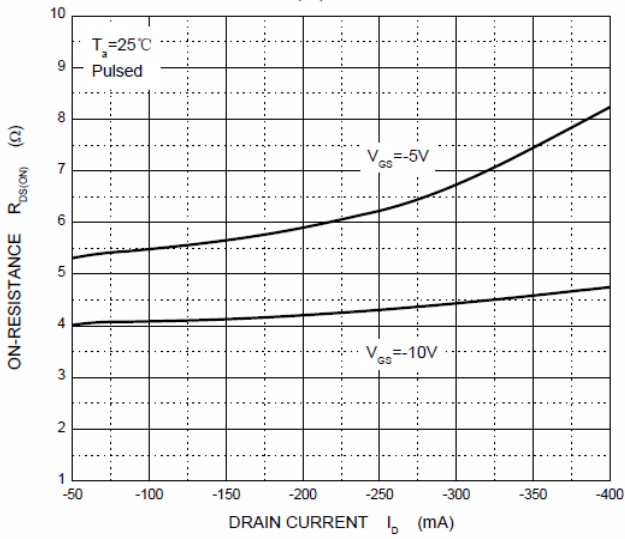
Output Characteristics



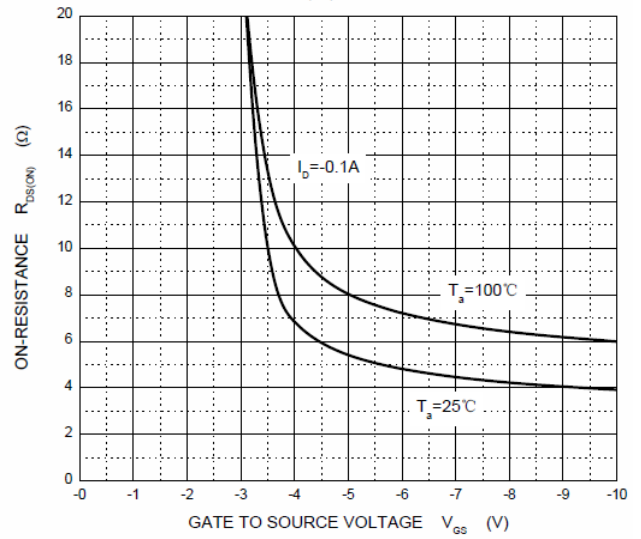
Transfer Characteristics



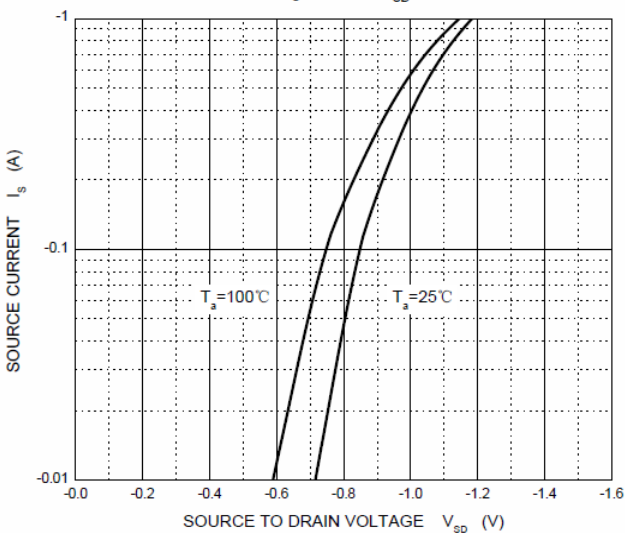
$R_{DS(ON)}$  —  $I_D$



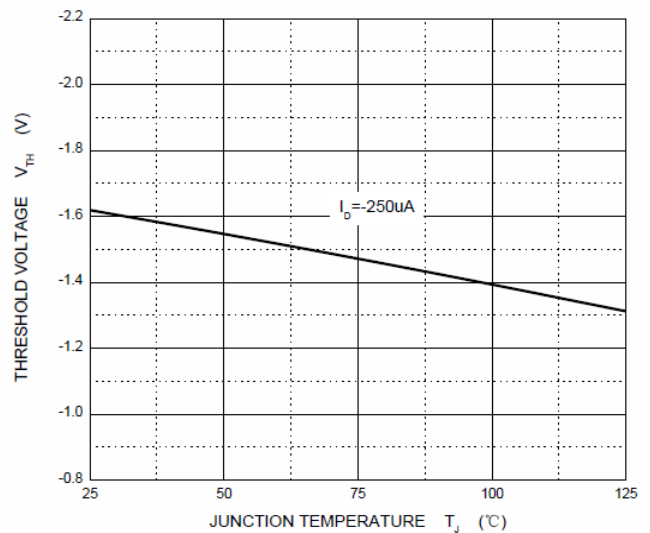
$R_{DS(ON)}$  —  $V_{GS}$



$I_S$  —  $V_{SD}$

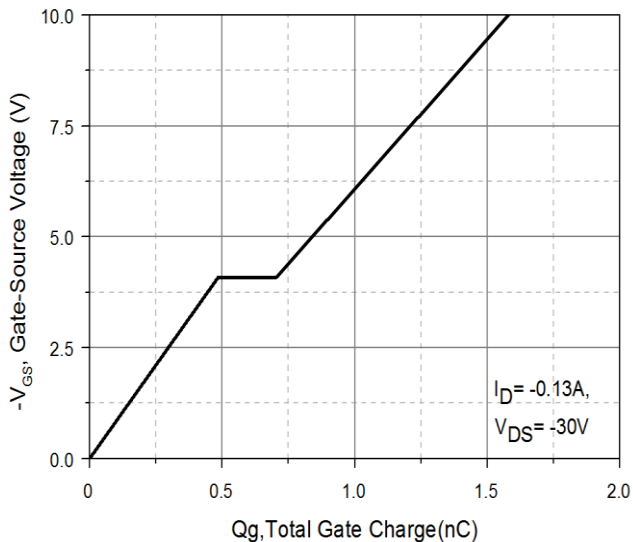


Threshold Voltage



**CHARACTERISTIC CURVES**

Gate Charge Characteristics



Capacitance vs Drain-to-Source Voltage

