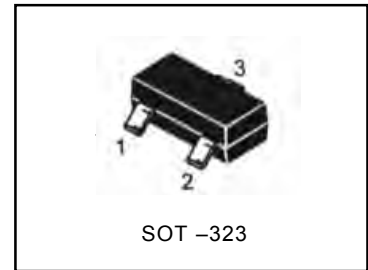


### P-Channel SOT-323

These miniature surface mount MOSFETs reduce power loss conserve energy, making this device ideal for use in small power management circuitry. Typical applications are dc-dc converters, load switching, power management in portable and battery-powered products such as computers, printers, cellular and cordless telephones.

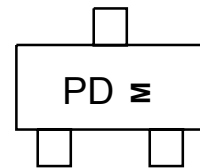
- Energy Efficient
- Miniature SOT-323 Surface Mount Package Saves Board Space
- **Pb-Free package is available**  
RoHS product for packing code suffix "G"  
Halogen free product for packing code suffix "H"



#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (Note 3.) $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	225 1.8	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Total Device Dissipation Alumina Substrate, (Note 4.) $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	300 2.4	mW mW/ $^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C/W}$
Junction and Storage Temperature	$T_J, T_{stg}$	-55 to +150	$^\circ\text{C}$

#### Marking Diagram



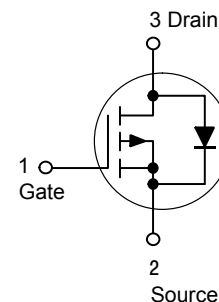
PD = Device Code  
M = Month Code

#### ORDERING INFORMATION

Device	Package	Shipping
BSS84WT1	SOT-323	3000/Tape&Reel

#### MAXIMUM RATINGS ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

Rating	Symbol	Value	Unit
Drain-to-Source Voltage	$V_{DSS}$	50	V <sub>dc</sub>
Gate-to-Source Voltage – Continuous	$V_{GS}$	$\pm 20$	V <sub>dc</sub>
Drain Current			mA
– Continuous @ $T_A = 25^\circ\text{C}$	$I_D$	130	
– Pulsed Drain Current ( $t_p \leq 10 \mu\text{s}$ )	$I_{DM}$	520	
Total Power Dissipation @ $T_A = 25^\circ\text{C}$	$P_D$	225	mW
Operating and Storage Temperature Range	$T_J, T_{stg}$	-55 to 150	$^\circ\text{C}$
Thermal Resistance – Junction-to-Ambient	$R_{\theta JA}$	556	$^\circ\text{C/W}$
Maximum Lead Temperature for Soldering Purposes, for 10 seconds	$T_L$	260	$^\circ\text{C}$



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

Characteristic	Symbol	Min	Typ	Max	Unit
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**OFF CHARACTERISTICS**

Drain-to-Source Breakdown Voltage ( $V_{GS} = 0 \text{ Vdc}, I_D = 250 \mu\text{Adc}$ )	$V_{(BR)DSS}$	50	–	–	Vdc
Zero Gate Voltage Drain Current ( $V_{DS} = 25 \text{ Vdc}, V_{GS} = 0 \text{ Vdc}$ ) ( $V_{DS} = 50 \text{ Vdc}, V_{GS} = 0 \text{ Vdc}$ ) ( $V_{DS} = 50 \text{ Vdc}, V_{GS} = 0 \text{ Vdc}, T_J = 125^\circ\text{C}$ )	$I_{DSS}$	–	–	0.1 15 60	$\mu\text{Adc}$
Gate-Body Leakage Current ( $V_{GS} = \pm 20 \text{ Vdc}, V_{DS} = 0 \text{ Vdc}$ )	$I_{GSS}$	–	–	$\pm 10$	nAdc

**ON CHARACTERISTICS** (Note 1.)

Gate-Source Threshold Voltage ( $V_{DS} = V_{GS}, I_D = 1.0 \text{ mAdc}$ )	$V_{GS(th)}$	0.8	–	2.0	Vdc
Static Drain-to-Source On-Resistance ( $V_{GS} = 5.0 \text{ Vdc}, I_D = 100 \text{ mAdc}$ )	$r_{DS(on)}$	–	5.0	10	Ohms
Transfer Admittance ( $V_{DS} = 25 \text{ Vdc}, I_D = 100 \text{ mAdc}, f = 1.0 \text{ kHz}$ )	$ y_{fs} $	50	–	–	mS

**DYNAMIC CHARACTERISTICS**

Input Capacitance	( $V_{DS} = 5.0 \text{ Vdc}$ )	$C_{iss}$	–	30	–	pF
Output Capacitance	( $V_{DS} = 5.0 \text{ Vdc}$ )	$C_{oss}$	–	10	–	
Transfer Capacitance	( $V_{DG} = 5.0 \text{ Vdc}$ )	$C_{rss}$	–	5.0	–	

**SWITCHING CHARACTERISTICS** (Note 2.)

Turn-On Delay Time	$(V_{DD} = -15 \text{ Vdc}, I_D = -2.5 \text{ Adc}, R_L = 50 \Omega)$	$t_{d(on)}$	–	2.5	–	ns
Rise Time		$t_r$	–	1.0	–	
Turn-Off Delay Time		$t_{d(off)}$	–	16	–	
Fall Time		$t_f$	–	8.0	–	
Gate Charge		$Q_T$	–	6000	–	

**SOURCE-DRAIN DIODE CHARACTERISTICS**

Continuous Current	$I_S$	–	–	0.130	A
Pulsed Current	$I_{SM}$	–	–	0.520	
Forward Voltage (Note 2.)	$V_{SD}$	–	2.5	–	V

1. Pulse Test: Pulse Width  $\leq 300 \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
2. Switching characteristics are independent of operating junction temperature.

**TYPICAL ELECTRICAL CHARACTERISTICS**

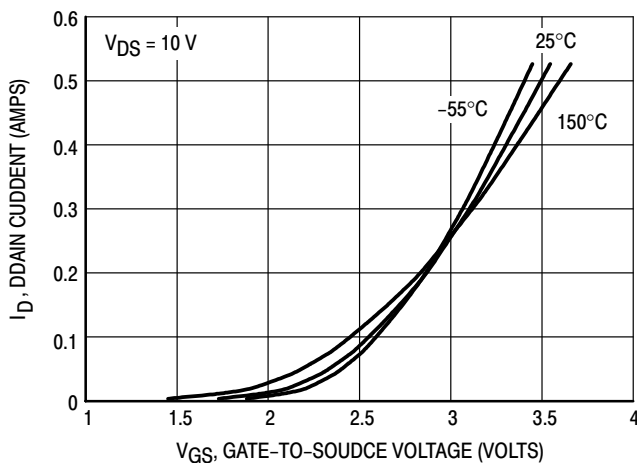


Figure 1. Transfer Characteristics

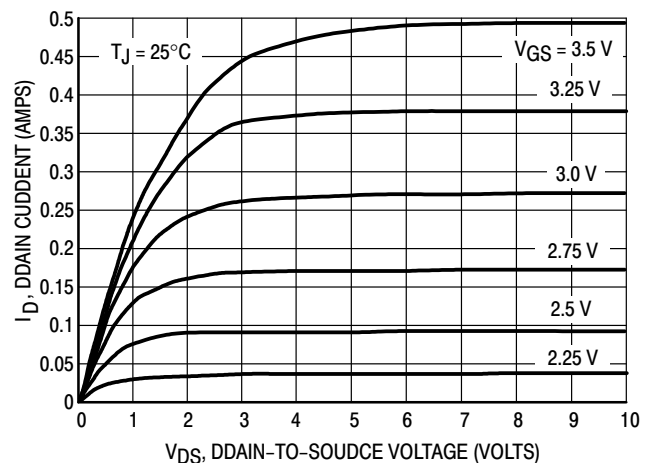
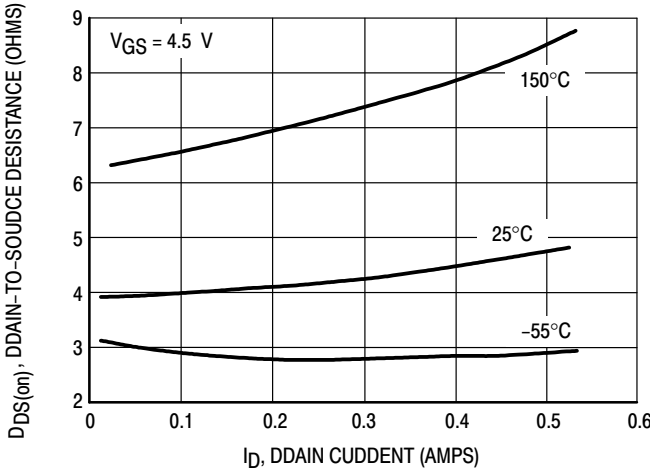
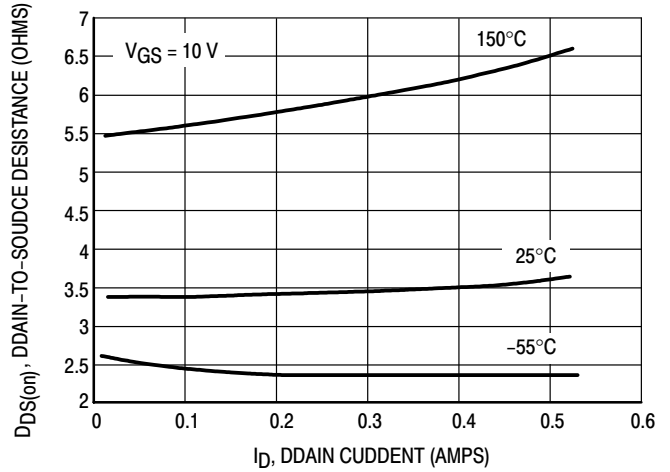


Figure 2. On-Region Characteristics

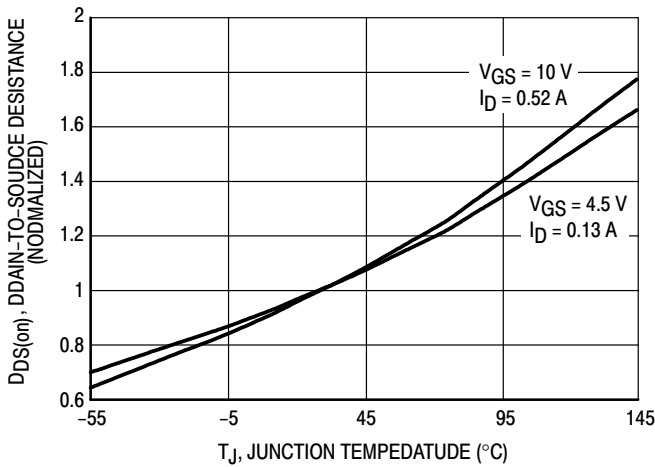
**TYPICAL ELECTRICAL CHARACTERISTICS**



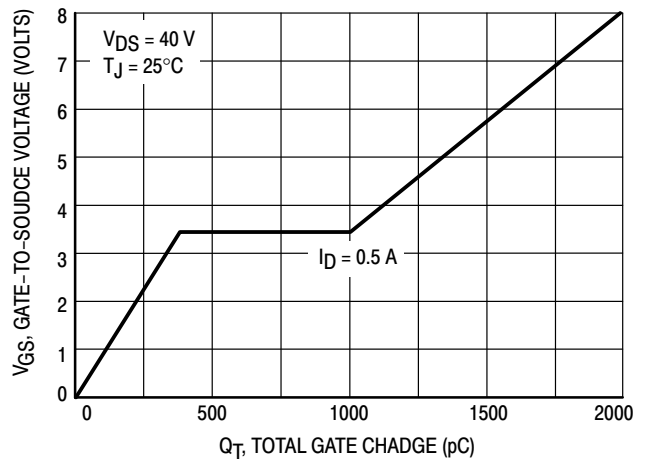
**Figure 3. On-Resistance versus Drain Current**



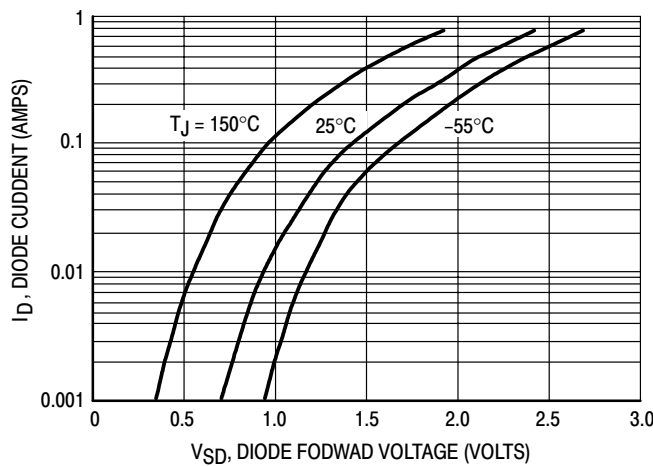
**Figure 4. On-Resistance versus Drain Current**



**Figure 5. On-Resistance Variation with Temperature**

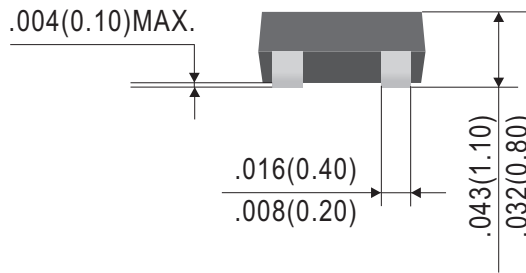
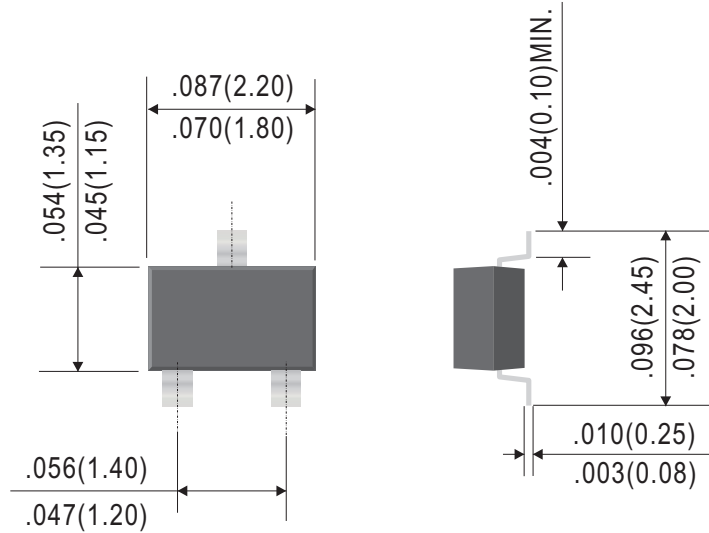


**Figure 6. Gate Charge**



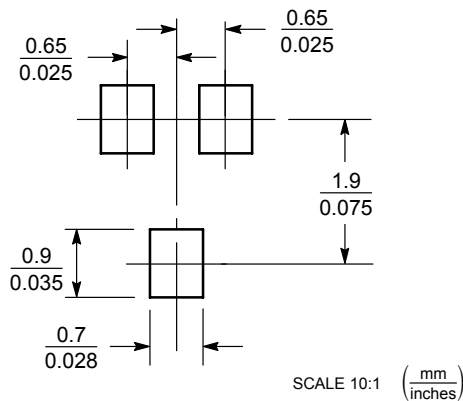
**Figure 7. Body Diode Forward Voltage**

### SOT-323

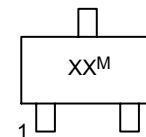


Dimensions in inches and (millimeters)

#### SOLDERING FOOTPRINT\*



#### GENERIC MARKING DIAGRAM



- XX = Specific Device Code
- M = Date Code
- = Pb-Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present.

**Ordering Information:**

Device PN	Packing
BSS84WT1G <sup>(1)</sup> -WS	Tape&Reel: 3 Kpcs/Reel

Note: (1) RoHS product for packing code suffix "G" ; Halogen free product for packing code suffix "H"

**\*\*\*Disclaimer\*\*\***

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