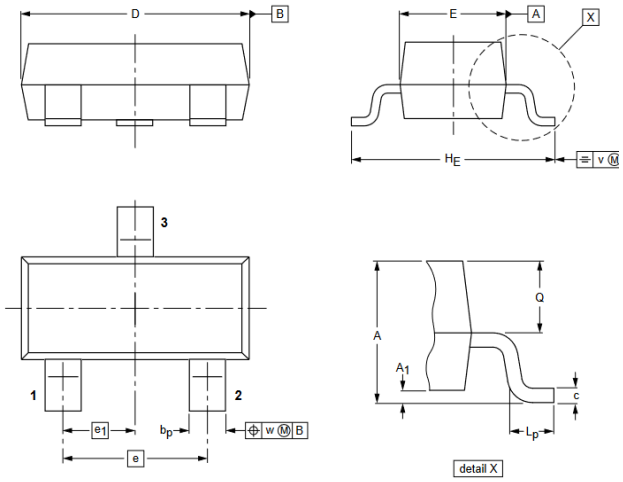
N-Channel MOSFET

Primary characteristics			
Symbol	**Parameter**	**Value**	**Unit**
I_D	Continuous drain current (@T_a=25°C)	170	mA
V_{DS}	Drain source voltage	100	V
R_{DSON} @V_{GS}=4.5V, I_D=170mA	Static drain-source on-resistance	<10	Ω

Features

- **SOT-23** case for easy automatic insertion
- Pb-free and **RoHS** compliant
- ESD protected 2kV HBM

Case dimensions



1 – Gate; 2 – Source; 3 - Drain

SOT-23 (TO-236AB)

Unit	A	A_1max	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w
mm	1.0 ±0.1	0.1	0.43 ±0.05	0.12 ±0.03	2.9 ±0.1	1.3 ±0.1	1.9	0.95	2.3 ±0.2	0.3 ±0.15	0.5 ±0.05	0.2	0.1

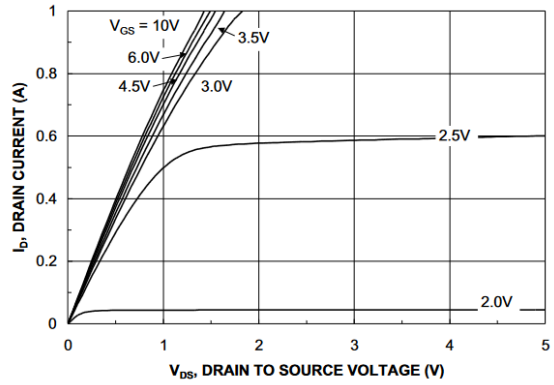
Absolute maximum ratings (T_A = 25°C unless otherwise noted)			
Characteristic	**Symbol**	**Value**	**Unit**
Drain-source voltage	V_{DS}	100	V
Gate-source voltage	V_{GS}	±20	V
Continuous drain current	I_D	170	mA
Pulsed drain current	I_{DM}	680	mA
Power Dissipation	P_D	360	mW
Operating junction temperature range	T_J, T_{STG}	-55 ~ 150	°C
Thermal resistance junction-ambient	$R_{\theta JA}$	350	°C/W
Derate above 25°C		2.8	mW/°C

Electrical characteristics (T_A = 25°C)						
Characteristic	**Test condition**	**Symbol**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Drain-source breakdown voltage	V_{GS}=0V, I_D=250μA	V_{DSS}	100	-	-	V
Zero gate voltage drain current	V_{DS}=100V, V_{GS}=0V	I_{DSS}	-	-	1.0	μA
	V_{DS}=100V, V_{GS}=0V, T_J=55°C		-	-	60	
Gate-body leakage current	V_{GS}=±20V, V_{DS}=0V	I_{GSS}	-	-	±10	
Gate threshold voltage	V_{DS}=V_{GS}, I_D=1.0mA	$V_{GS(th)}$	0.8	-	2.8	V
Static drain-source on-state resistance	V_{GS}=10V, I_D=170mA	$R_{DS(ON)}$	-	-	6.0	Ω
	V_{GS}=10V, I_D=170mA, T_J=125°C		-	-	12	
	V_{GS}=4.5V, I_D=170mA		-	-	10	
On state drain current	V_{GS}=10V, V_{DS}=5.0V	$I_{D(ON)}$	680	-	-	mA
Dynamic electrical characteristics						
Characteristic	**Test condition**	**Symbol**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Forward transconductance	V_{DS}=10V, I_D=170mA	g_{FS}	0.08	-	-	S
Input capacitance	V_{DS}=25V V_{GS}=0V f=1.0MHz	C_{iss}	-	73	-	pF
Output capacitance		C_{oss}	-	7.0	-	
Reverse transfer capacitance		C_{rss}	-	3.4	-	
Gate resistance	V_{GS}=15mV, f=1.0MHz	R_g	-	2.2	-	Ω
Total gate charge	V_{DS}=30V V_{GS}=10V I_D=220mA	Q_g	-	1.8	2.5	nC
Gate source charge		Q_{gs}	-	0.2	-	
Gate drain charge		Q_{gd}	-	0.3	-	
Switching characteristics						
Characteristic	**Test condition**	**Symbol**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Turn on delay time	V_{DS}=30V V_{GS}=10V I_D=280mA R_G=6.0Ω	$t_{d(ON)}$	-	1.7	3.4	ns
Turn on rise time		t_r	-	9.0	18	
Turn off delay time		$t_{d(OFF)}$	-	17	31	
Turn off fall time		t_f	-	2.4	5.0	
Source drain diode characteristics						
Characteristic	**Test condition**	**Symbol**	**Value**			**Unit**
			Min.	**Typ.**	**Max.**	
Body diode reverse recovery time	I_F=170mA, d_I/d_t=100A/μs	t_{rr}	-	11	-	ns
Body diode reverse recovery charge		Q_{rr}	-	3.0	-	nC
Maximum body-diode continuous current		I_S	-	-	170	mA
Diode forward voltage	I_S=340mA, V_{GS}=0V	V_{SD}	-	-	1.3	V

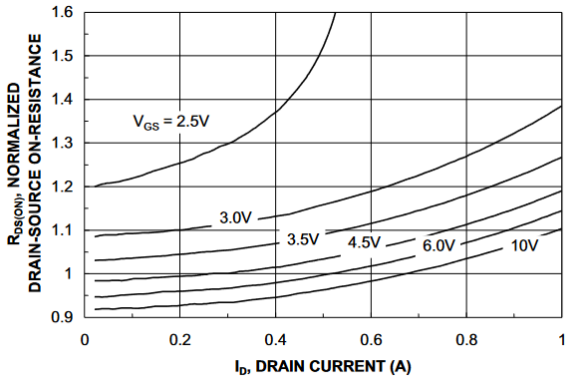
Notes: Pulse test: pulse width≤300μs, duty cycle≤2%

Typical characteristics

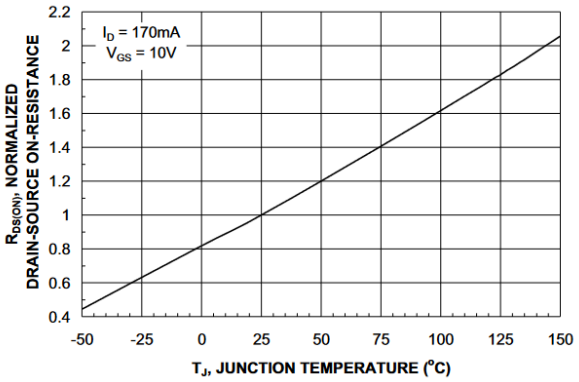
ON-region characteristics



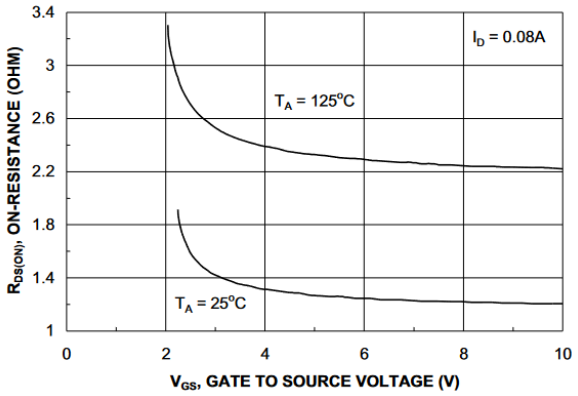
ON-resistance variation with drain current and gate voltage



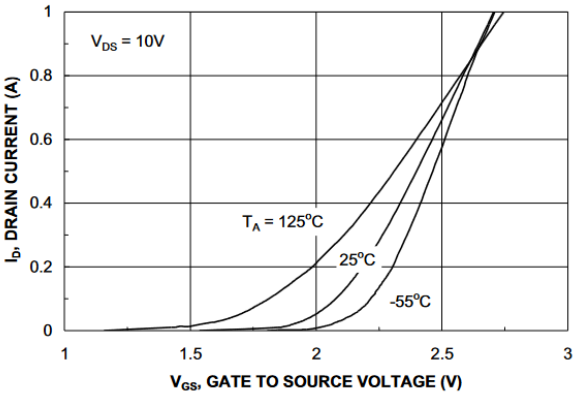
ON-resistance variation with temperature



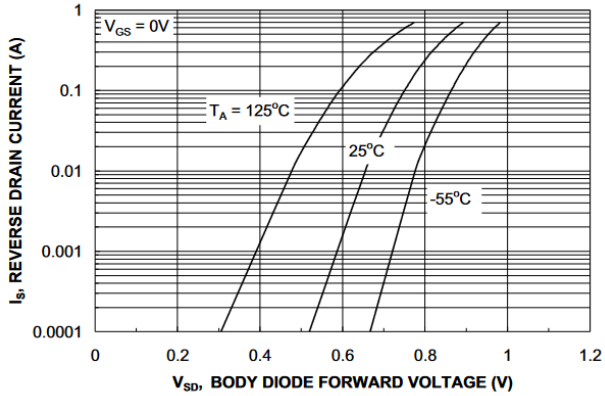
ON-resistance variation with gate-to-source voltage



Transfer characteristics

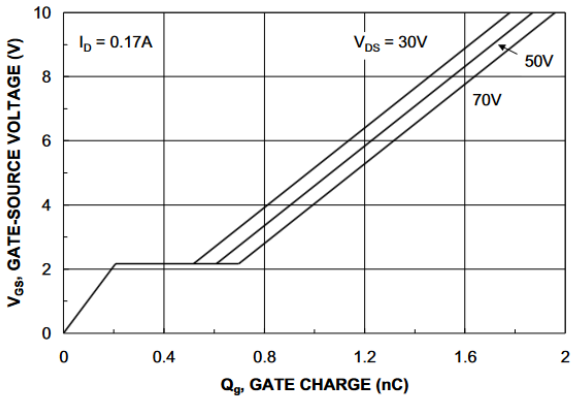


Body diode forward voltage variation with source current and temperature

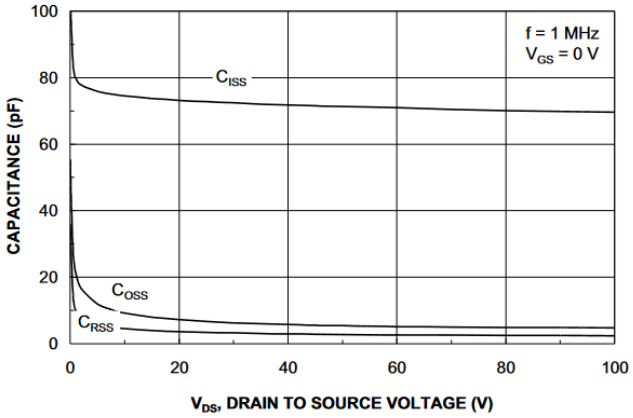


Typical characteristics

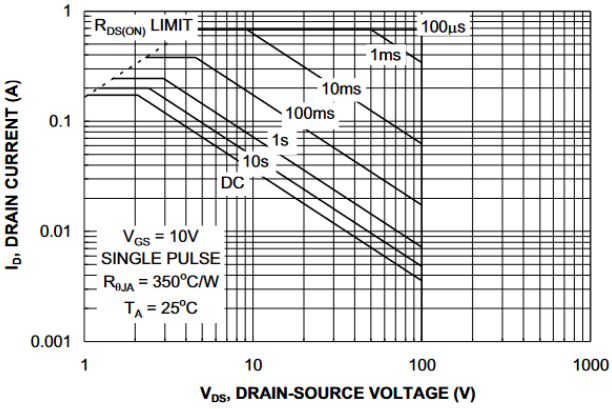
Gate charge characteristics



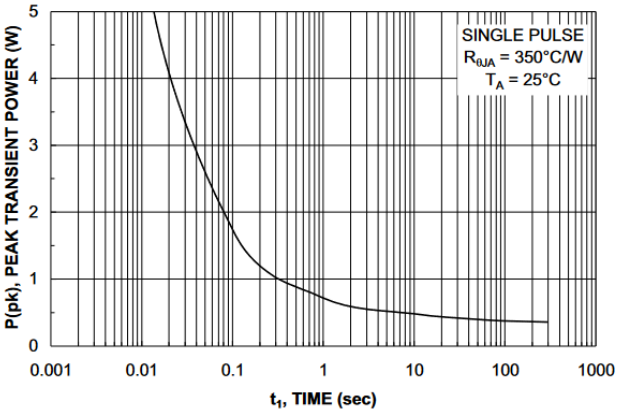
Capacitance characteristics



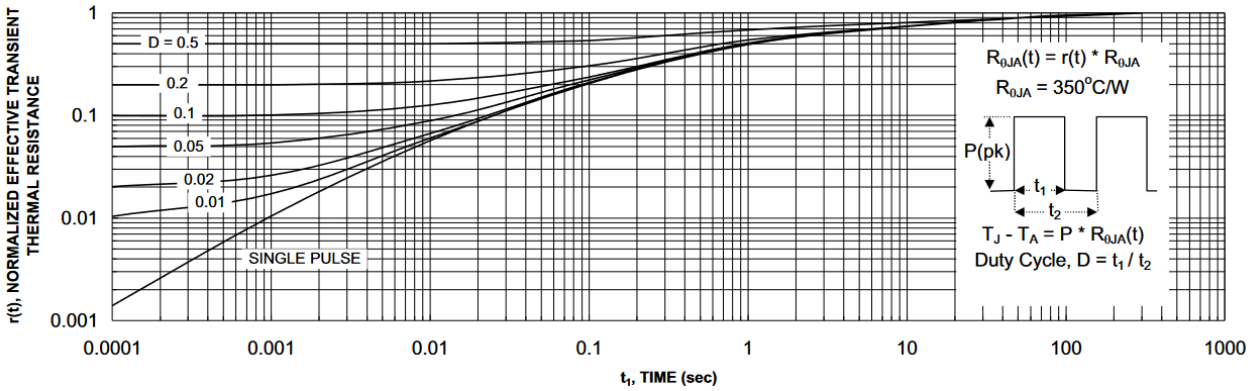
Maximum safe operating area

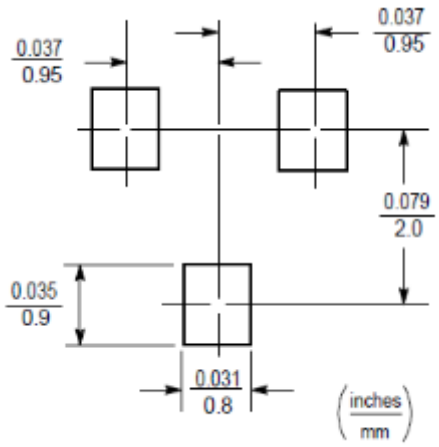


Single pulse maximum power dissipation



Normalized effective transient thermal impedance



Suggested soldering pad layout

SOT-23

Ordering information			
Part Number	**Package**	**Shipping Quantity**	**Dimensions**
BSS123	SOT-23	**3000 pcs / 7" reel**	---

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