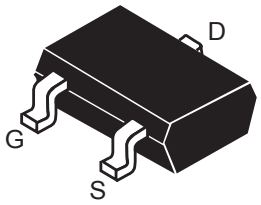
South Sea Semiconductor

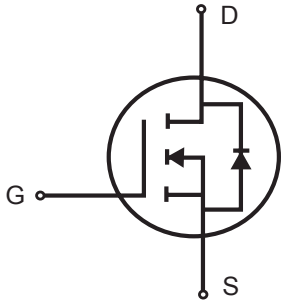
BSS138D

N-Channel Enhancement Mode MOSFET

Product Summary		
V_{DS} (V)	I_D (A)	$R_{DS(ON)}$ (Ω) Max
60V	0.25A	3.0 @V_{GS} = 10V
		4.0 @V_{GS} = 5V

SOT-23





FEATURES

- Super high dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- SOT-23 package.
- Pb Free.

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Drain Current-Continuous @ T_J = 125°C [a]	T_A = 25°C	I_D	250	mA
	T_A = 100°C		190	
-Pulsed [b]		I_{DM}	1	A
Drain-Source Diode Forward Current [a]		I_S	250	mA
Maximum Power Dissipation [a]	T_A = 25°C	P_D	200	mW
	T_A = 100°C		140	
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C
THERMAL CHARACTERISTICS				
Thermal Resistance, Junction-to-Ambient [a]		$R_{\theta JA}$	625	°C/W

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N-Channel Electrical Characteristics (T_A = 25°C unless otherwise noted)						
Parameter	Symbol	Condition	Min	Typ[c]	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=10μA	60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V			1	μA
Gate-Body Leakage	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=250μA	0.8	1.4	1.6	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=250mA		2	3	Ω
		V_{GS}= 5V, I_D=50mA		2.5	4	
On-State Drain Current	$I_{D(ON)}$	V_{DS}=7V, V_{GS}=10V	495			mA
Forward Transconductance	g_{FS}	V_{DS}=7V, I_D=200mA	78			mS
Input Capacitance	C_{ISS}	V_{DS}=25V		20	50	pF
Output Capacitance	C_{OSS}	V_{GS}=0V		11	25	
Reverse Transfer Capacitance	C_{RSS}	f=1.0MHz		2.5	5	
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=30V,		7.8	20	ns
Rise Time	t_r	I_D=100mA,		5.5		
Turn-Off Delay Time	$t_{D(OFF)}$	V_{GS}=10V,		7.8	20	
Fall Time	t_f	R_{GEN}=10Ω		2.8		
Diode-Forward Voltage	V_{SD}	V_{GS}=0V, I_D=250mA		0.75	1.5	V

Notes：

a. Surface Mounted on FR4 Board, t ≤10 sec.

b. Pulse Test：Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.

c. Guaranteed by design, not subject to production testing.

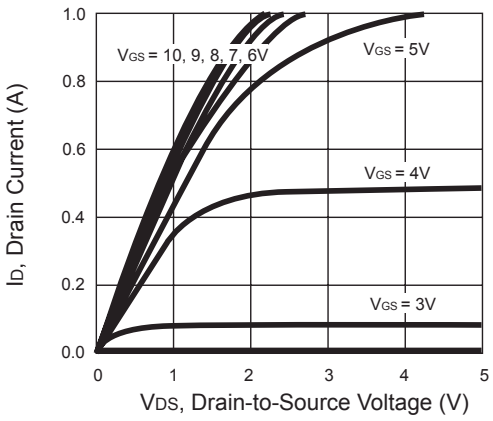

Figure 1. Output Characteristics

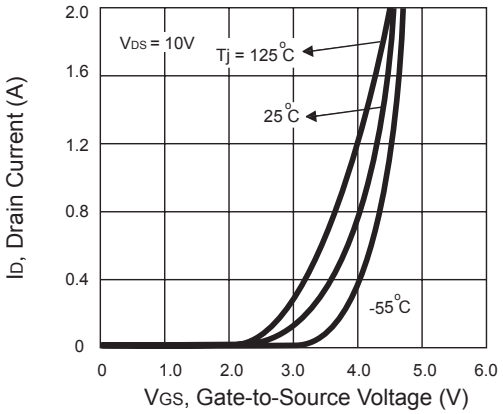

Figure 2. Thansfer Characteristics

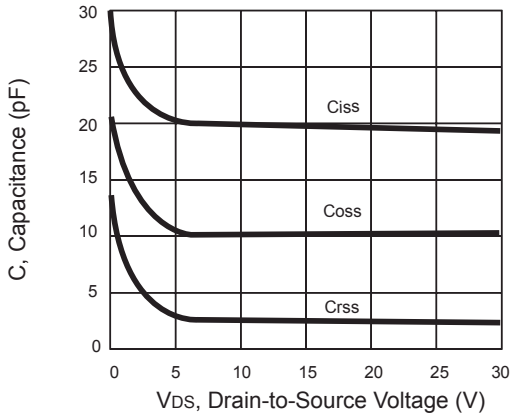

Figure 3. Capacitance

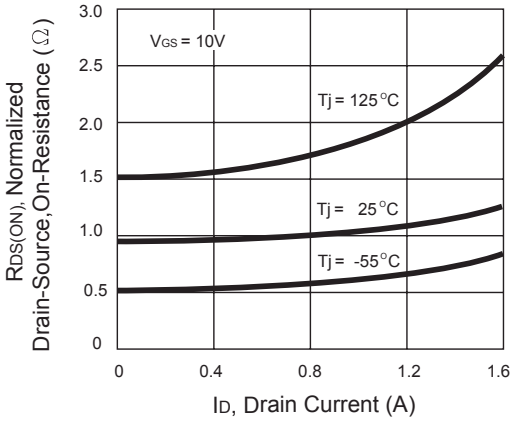

Figure 4. On-Resistance Variation with Temperature

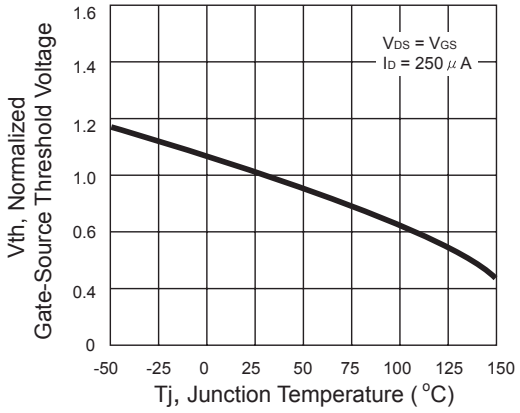

Figure 5. Gate Threshold Variation with Temperature

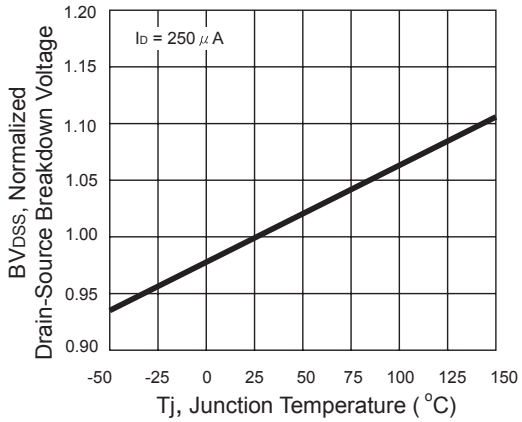

Figure 6. Breakdown Voltage Variation with Temperature

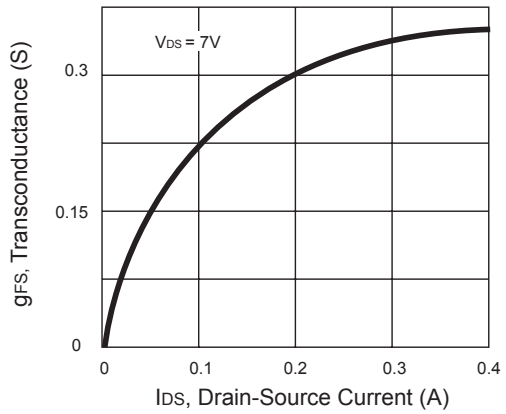

Figure 7. Transconductance Variation with Drain Current

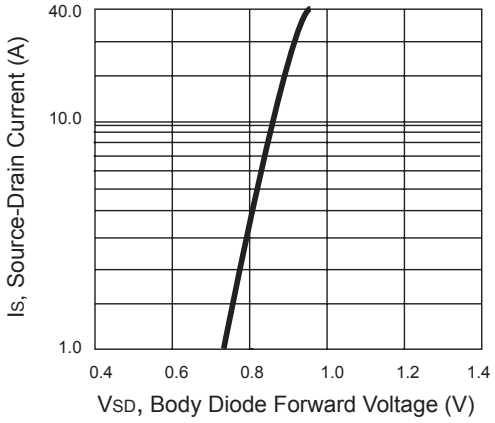

Figure 8. Body Diode Forward Voltage Variation with Source Current

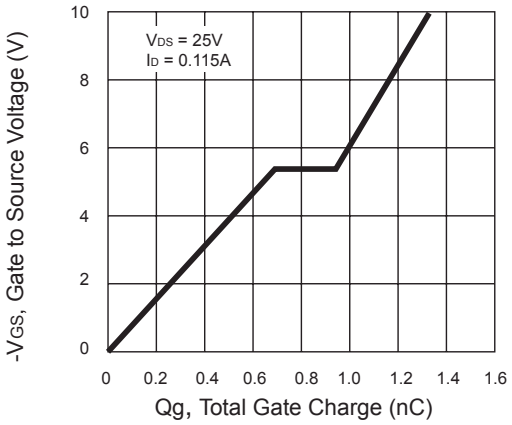

Figure 9. Gate Charge

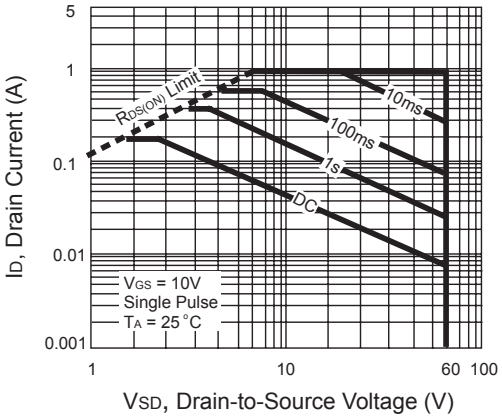

Figure 10. Maximum Safe Operating Area

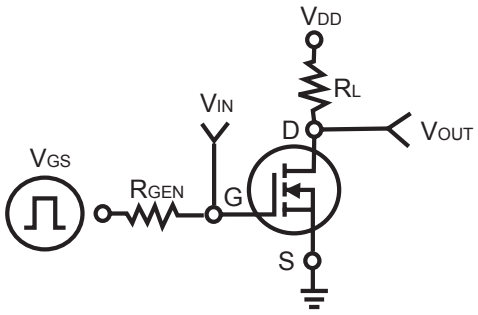

Figure 11. Switching Test Circuit

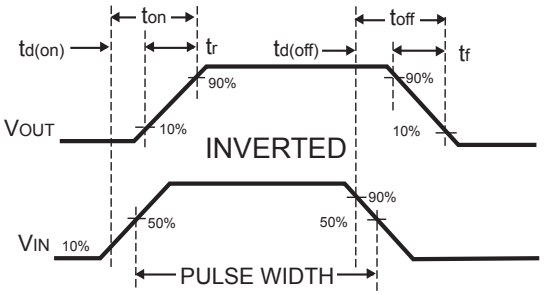

Figure 12. Switching Waveforms

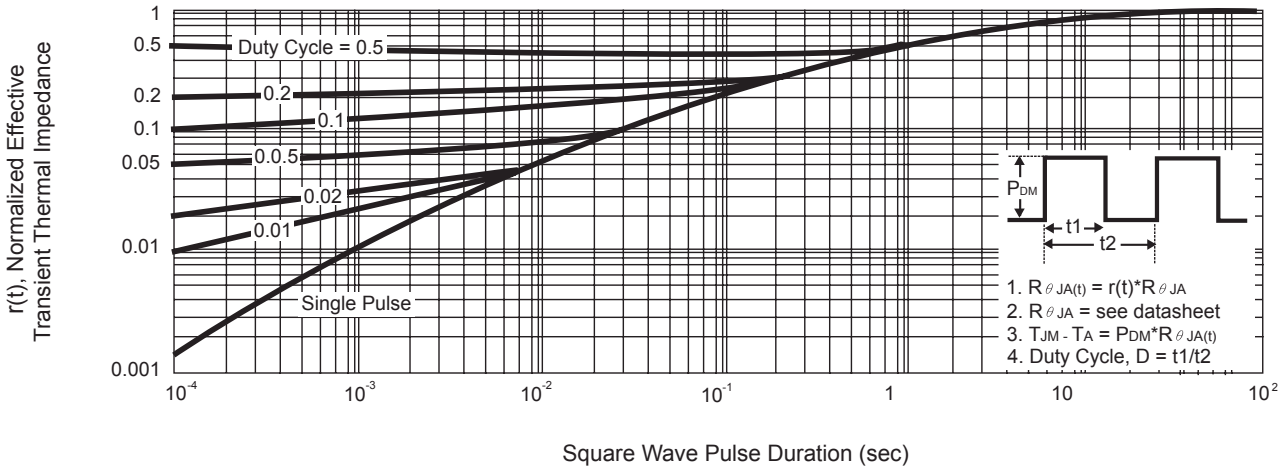

Figure 13. Normalized Thermal Transient Impedance Curve