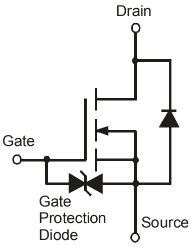
HAICHUANG SEMI

BSS138K

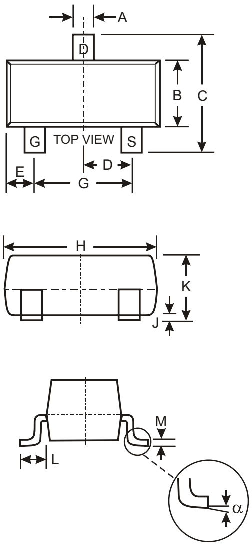
N-CHANNEL ENHANCEMENT MODE MOSFET

Features

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- ESD protected.
- Marking Code:SK



EQUIVALENT CIRCUIT



SOT-23		
Dim	**Min**	**Max**
A	0.37	0.51
B	1.20	1.40
C	2.30	2.50
D	0.89	1.03
E	0.45	0.60
G	1.78	2.05
H	2.80	3.00
J	0.013	0.10
K	0.903	1.10
L	0.45	0.61
M	0.085	0.180
α	0°	8°
All Dimensions in mm		

Maximum Ratings @ T_A = 25°C unless otherwise specified

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	50	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	0.22	A
Drain Current-Pulsed (Note 1)	I_{DM}	0.88	A
Maximum Power Dissipation	P_D	0.35	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	350	℃/W

Electrical Characteristics @ T_A = 25°C unless otherwise specified

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250µA	50			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=50V,V_{GS}=0V			1	µA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			±10	uA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250µA	0.5	0.85	1.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=0.20A		1.5	2.5	Ω
		V_{GS}=10V, I_D=0.22A		1.1	2.0	Ω
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=0.2A	0.2			S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{Iss}	V_{DS}=25V,V_{GS}=0V, F=1.0MHz		30		PF
Output Capacitance	C_{oss}			15		PF
Reverse Transfer Capacitance	C_{rss}			6		PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=30V,I_D=0.22A V_{GS}=10V,R_{GEN}=6Ω			5	nS
Turn-on Rise Time	t_r				5	nS
Turn-Off Delay Time	$t_{d(off)}$				60	nS
Turn-Off Fall Time	t_f				35	nS
Total Gate Charge	Q_g	V_{DS}=25V,I_D=0.2A, V_{GS}=10V			2.4	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=0.22A			1.3	V
Diode Forward Current (Note 2)	I_S				0.22	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300µs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

TYPICAL TRANSIENT CHARACTERISTICS

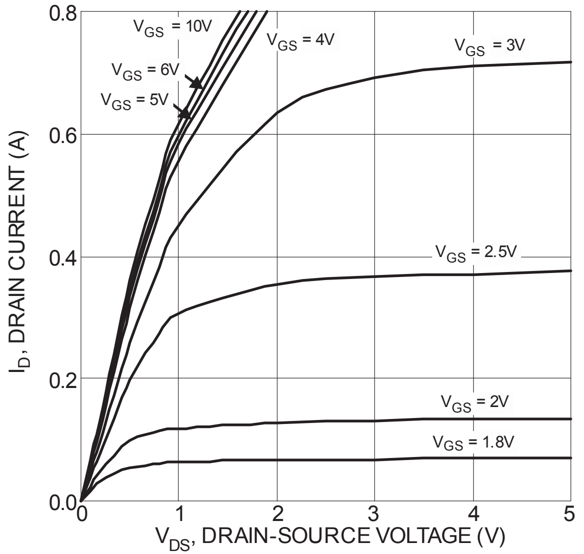


Figure 1 Typical Output Characteristic

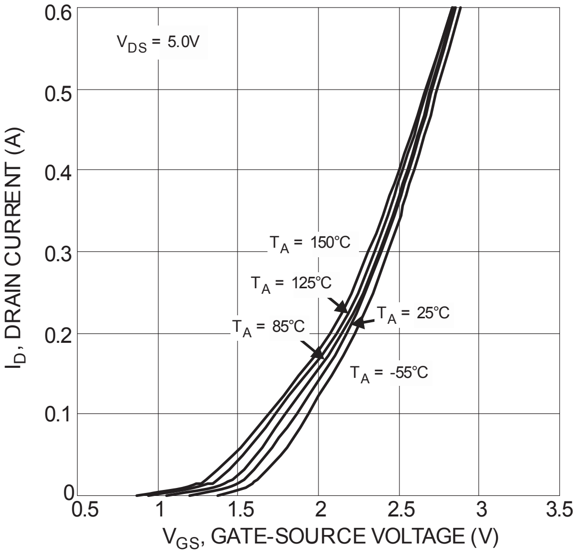


Figure 2 Typical Transfer Characteristics

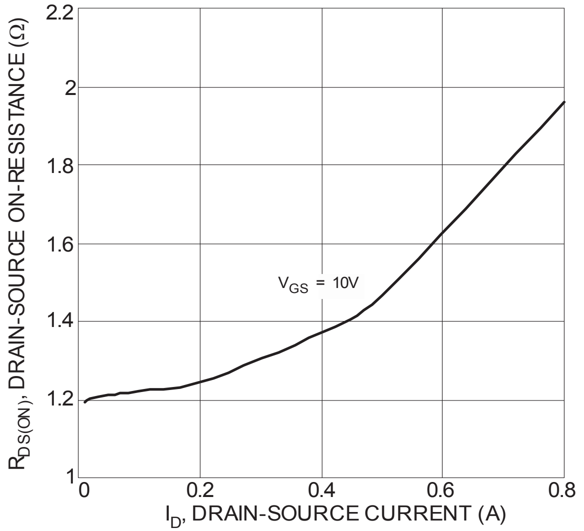


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

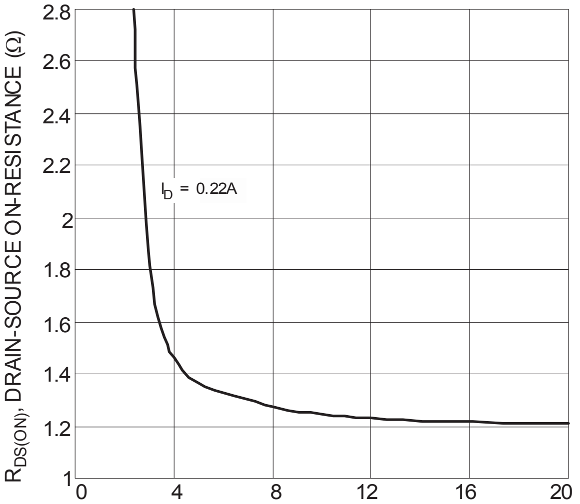


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

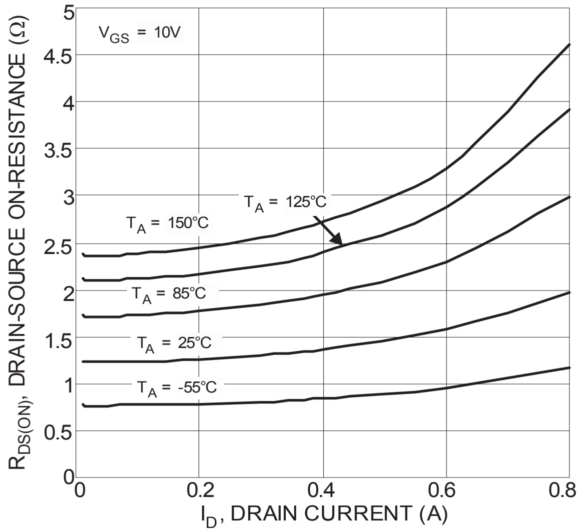


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

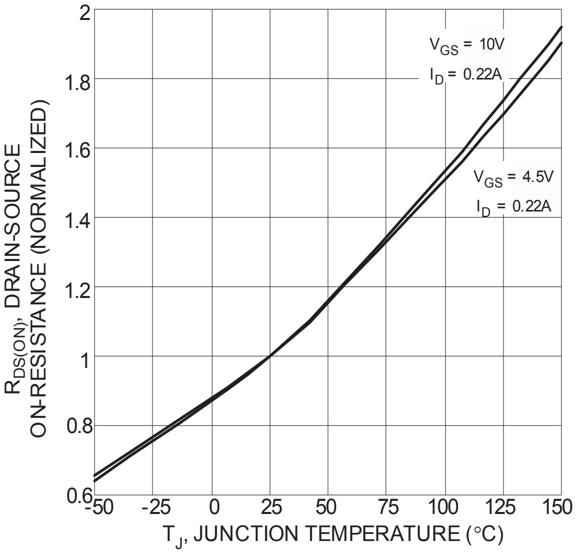


Figure 6 On-Resistance Variation with Temperature

TYPICAL TRANSIENT CHARACTERISTICS

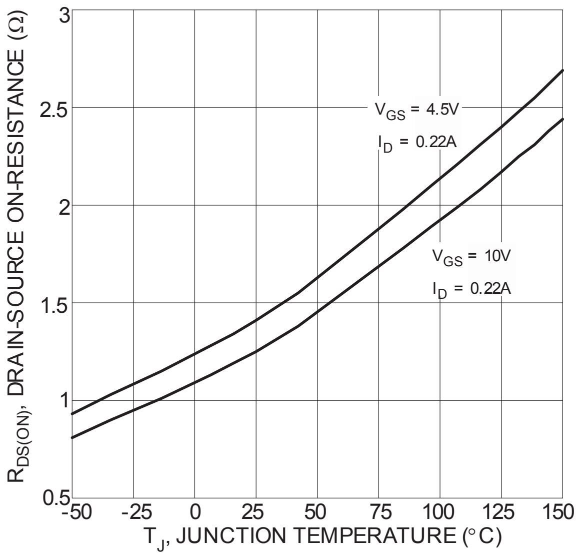


Figure 7 On-Resistance Variation with Temperature

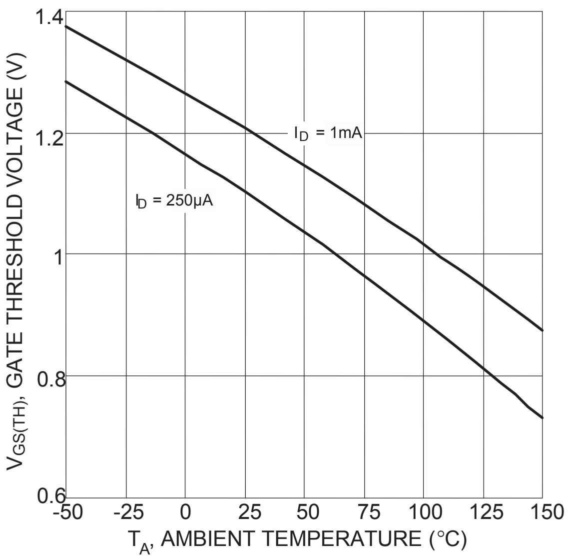


Figure 8 Gate Threshold Variation vs. Ambient Temperature

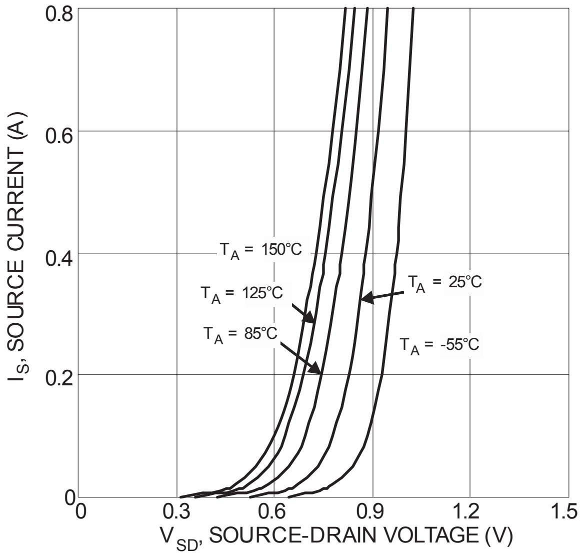


Figure 9 Diode Forward Voltage vs. Current

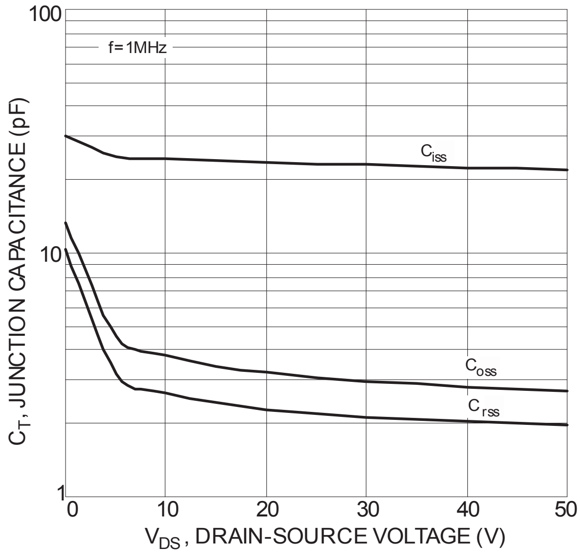


Figure 10 Typical Junction Capacitance

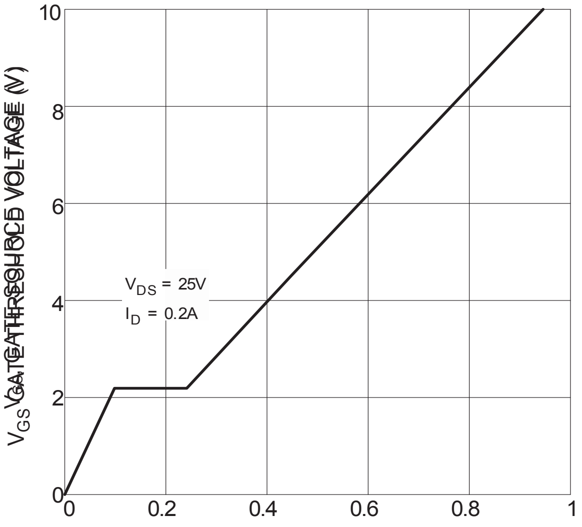


Figure 11 Gate Charge

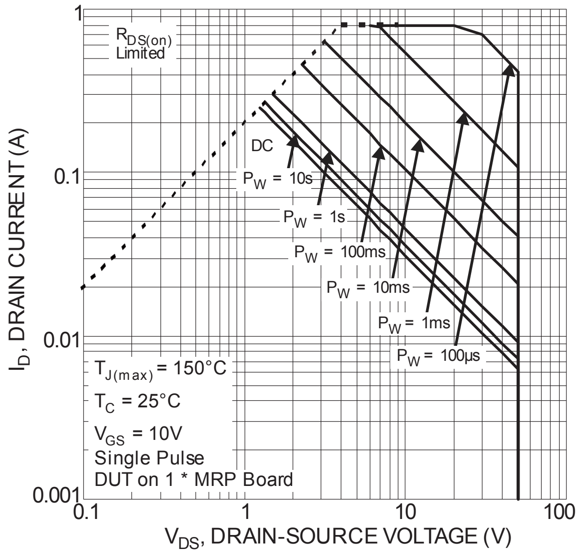


Figure 12 SOA, Safe Operation Area

TYPICAL TRANSIENT CHARACTERISTICS

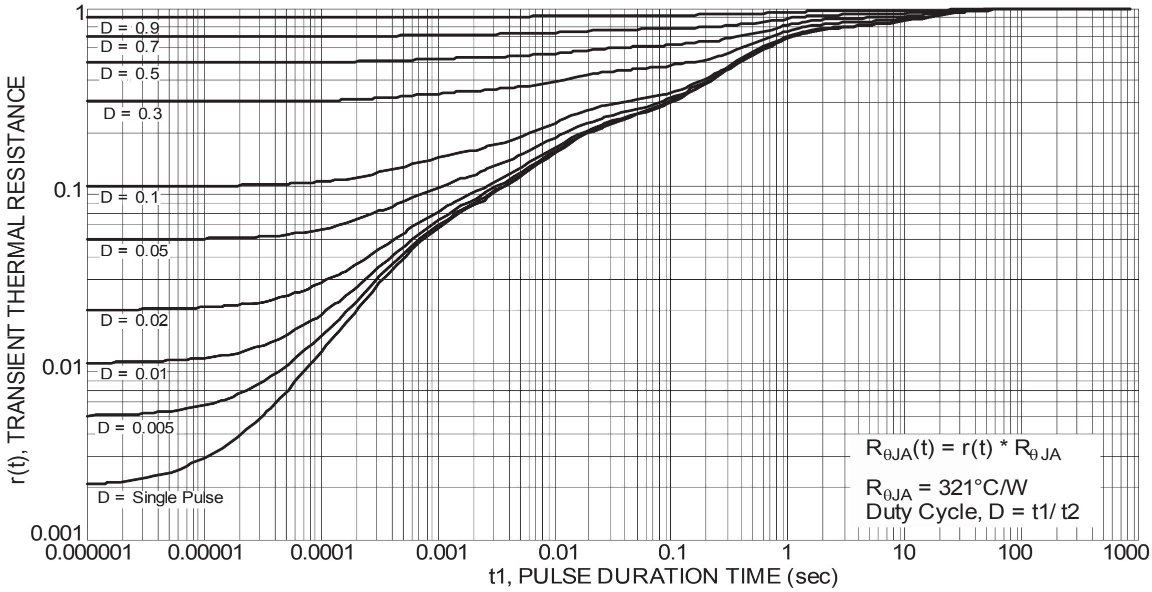


Figure 13 Transient Thermal Resistance

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