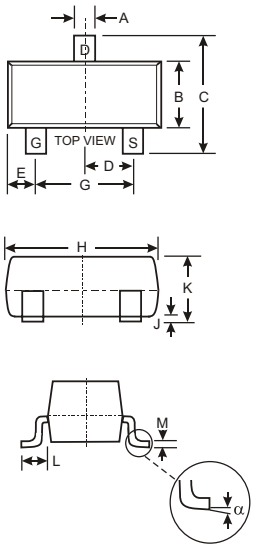
HAICHUANG SEMI

HC0102

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

Features

- Super high density cell design for extremely low $R_{DS(ON)}$.
- Fully characterized avalanche voltage and current.
- Excellent package for good heat dissipation.
- We declare that the material of product compliance with RoHS requirements.



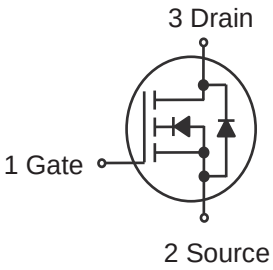
SOT-23		
Dim	**Min**	**Max**
A	0.37	0.51
B	1.20	1.40
C	2.30	2.50
D	0.89	1.03
E	0.45	0.60
G	1.78	2.05
H	2.80	3.00
J	0.013	0.10
K	0.903	1.10
L	0.45	0.61
M	0.085	0.180
α	0°	8°
All Dimensions in mm		

APPLICATIONS

- Power Switching application.
- Hard switchen and high frequency circuits.
- Uniterruptible power supply.
- Marking Code:0102.

Maximum Ratings @ T_A = 25°C unless otherwise specified

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current	I_D	2.0	A
Peak Drain Current [1]	I_{DM}	5	A
Power Dissipation	P_{tot}	1.25	W
Thermal Resistance from Juntion to Ambient (PCB mounted) [2]	$R_{\theta JA}$	100	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{stg}	- 55 to + 150	℃



[1] Repetitive Rating: Pulse width limited by the Maximum junction temperation.

[2] 1 in^2 2oz Cu PCB board.

Electrical Characteristics @ T_A = 25°C unless otherwise specified

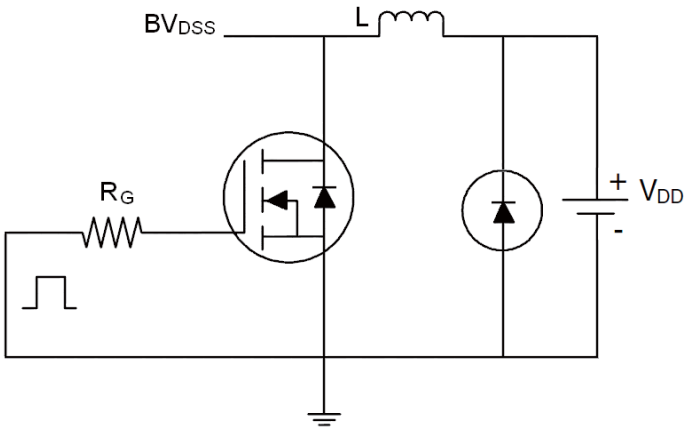
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	100	110	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1.2	1.8	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=2A	-	195	240	mΩ
		V_{GS}=4.5V, I_D=2A	-	204	260	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=2A	-	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=50V,V_{GS}=0V, F=1.0MHz	-	360.6	-	PF
Output Capacitance	C_{oss}		-	24.6	-	PF
Reverse Transfer Capacitance	C_{rss}		-	13	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=50V, R_L=25Ω V_{GS}=10V,R_G=1Ω	-	6	-	nS
Turn-on Rise Time	t_r		-	10	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	12	-	nS
Turn-Off Fall Time	t_f		-	8	-	nS
Total Gate Charge	Q_g	V_{DS}=50V,I_D=2A, V_{GS}=10V	-	12.0	-	nC
Gate-Source Charge	Q_{gs}		-	1.8	-	nC
Gate-Drain Charge	Q_{gd}		-	2.9	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=2A	-	-	1.2	V
Diode Forward Current (Note 2)	I_S		-	-	2	A

Notes:

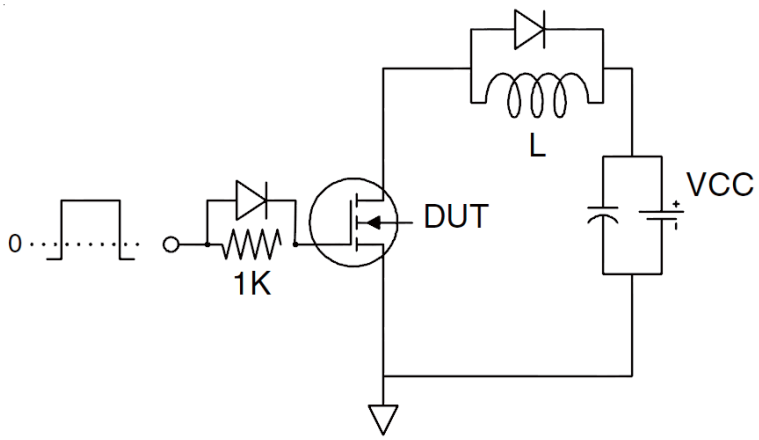
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production

TEST CIRCUIT

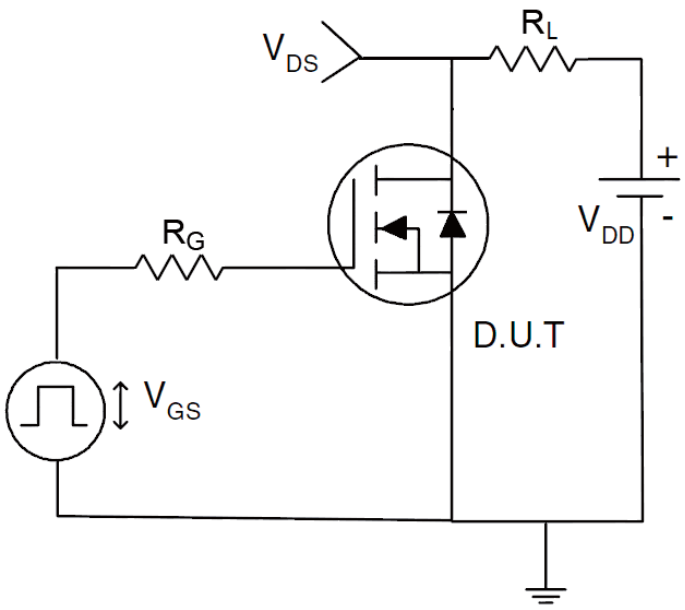
1）E_{AS} test circuit



2）Gate charge test circuit



3）Switch Time Test Circuit



TYPICAL TRANSIENT CHARACTERISTICS

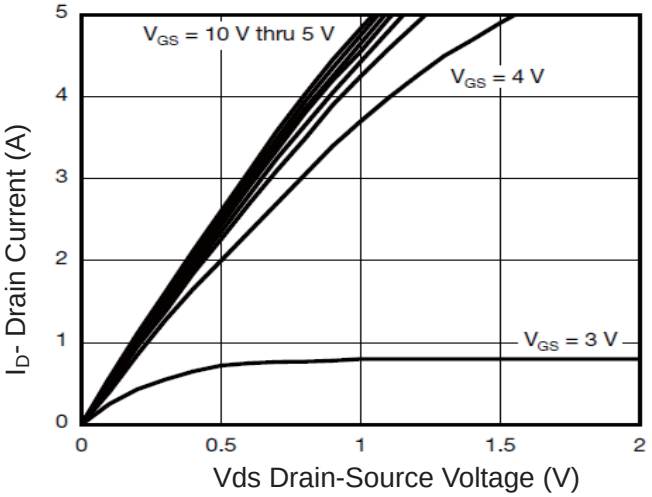


Figure 1 Output Characteristics

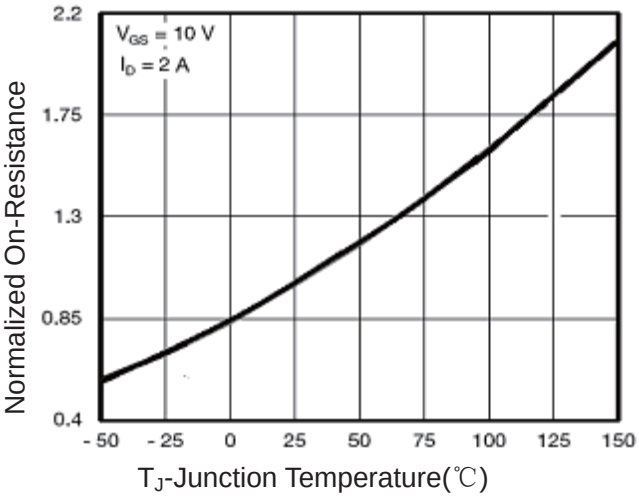


Figure 4 Rdson-JunctionTemperature

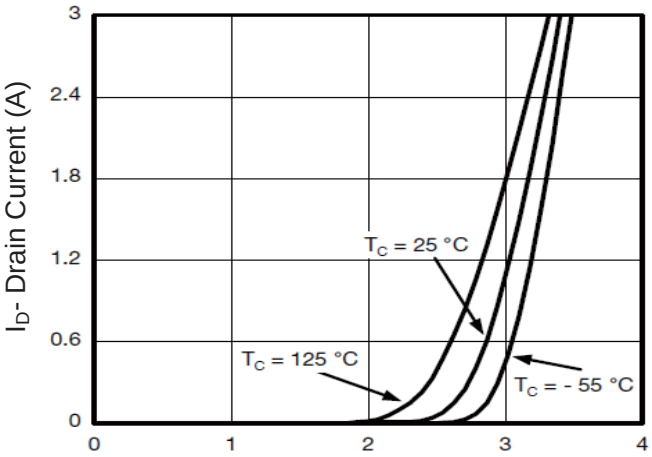


Figure 2 Transfer Characteristics

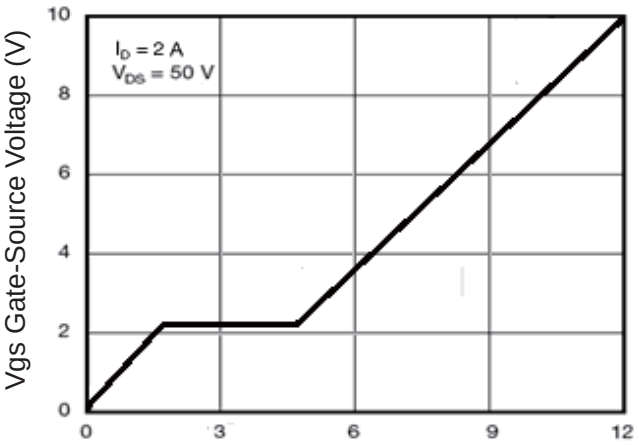


Figure 5 Gate Charge

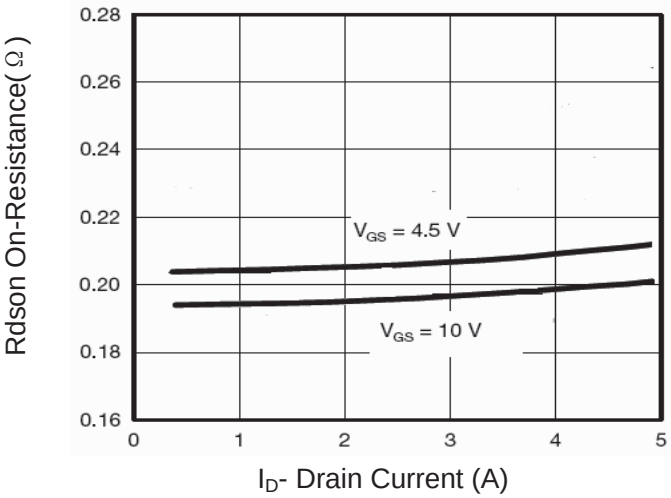


Figure 3 Rdson- Drain Current

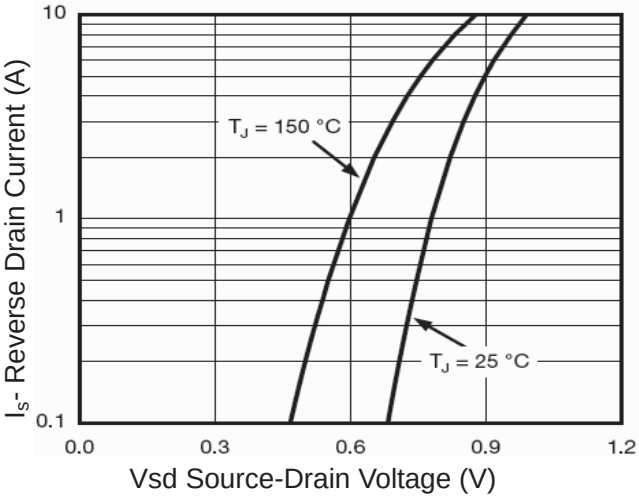


Figure 6 Source- Drain Diode Forward

TYPICAL TRANSIENT CHARACTERISTICS

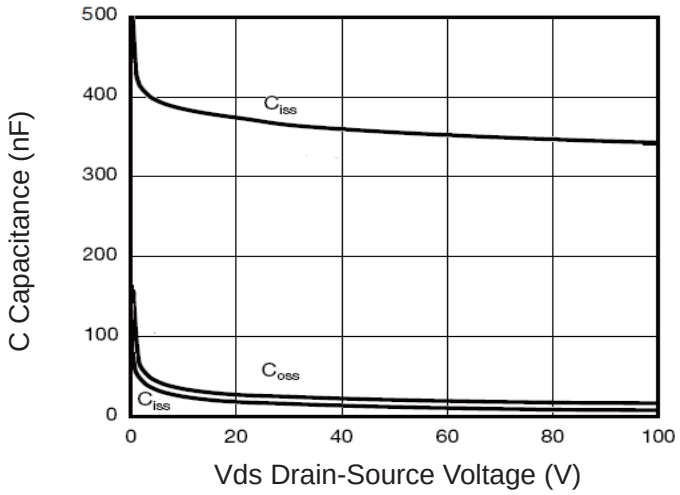


Figure 7 Capacitance vs Vds

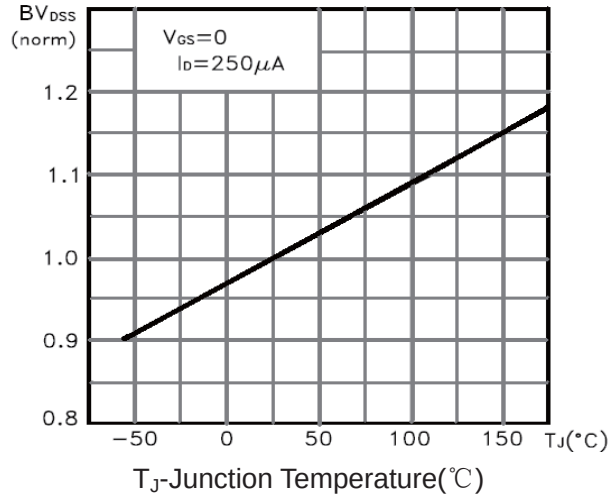


Figure 9 BV_{DSS} vs Junction Temperature

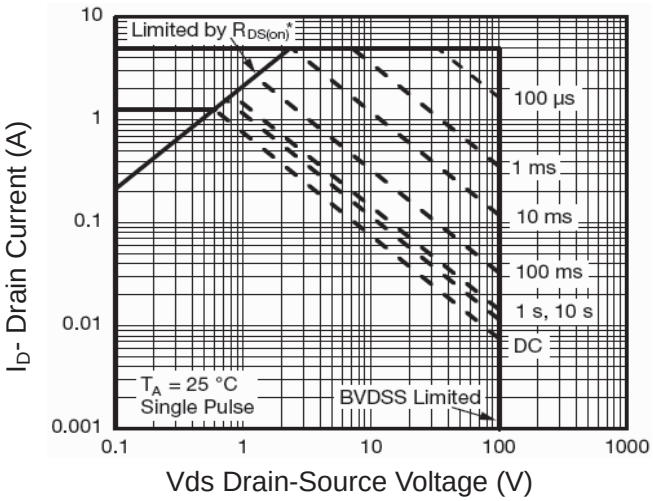


Figure 8 Safe Operation Area

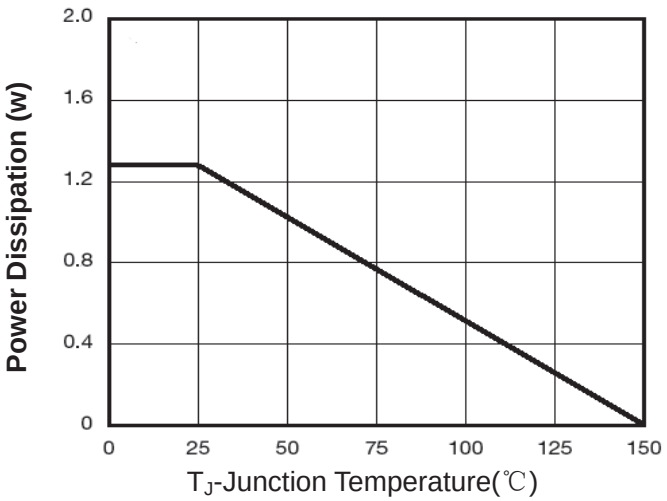


Figure 10 Power De-ratin

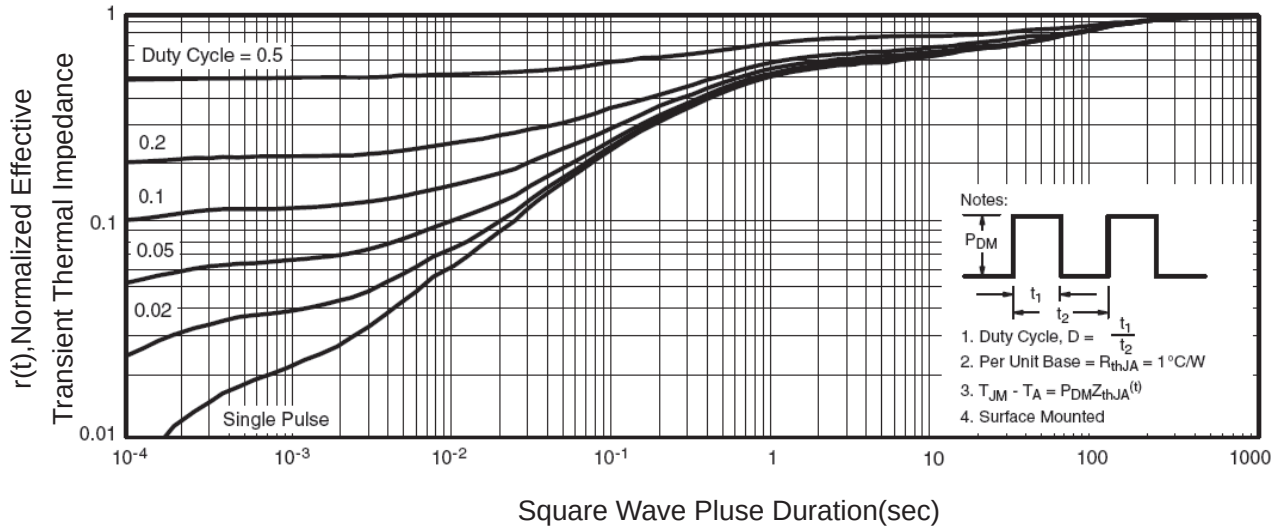


Figure 11 Normalized Maximum Transient Thermal Impedance

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