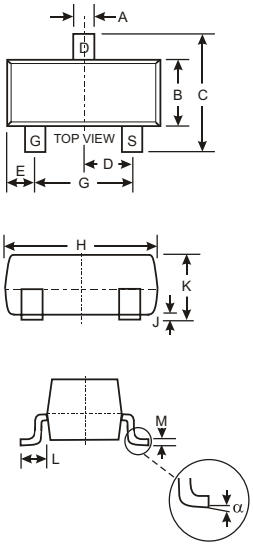
HAICHUANG SEMI

HC2305

P-CHANNEL ENHANCEMENT MODE MOSFET

Features

- Advanced trench process technology.
- High Density Cell Design For Ultra Lowe On-Resistance.
- Fully Characterized Avalanche Voltage and Current.
- Improved Shoot- Through FOM.
- 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		

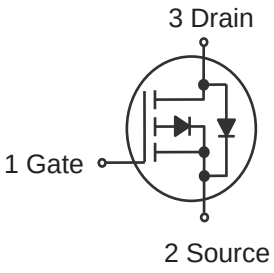
APPLICATIONS

- TrenchFET Power MOSFET.
- Load Switch for Portable Devices.
- DC/DC Converter.
- Marking Code:S5 OR A5SHB.

Maximum Ratings @ T_A = 25°C unless otherwise specified

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current	I_D	-4.4	A
Pulsed Drain Current (10 μs Pulse Width)	I_{DM}	-20	A
Maximum Power Dissipation	P_{tot}	0.96	W
Thermal Resistance from Juntion to Ambient (PCB mounted) [1]	$R_{\theta JA}$	130	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{stg}	- 55 to + 150	℃

[1] 1 in² 2oz Cu PCB board.



Electrical Characteristics @ T_A = 25°C unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-20			V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-0.4	-0.65	-1.0	
Gate-source leakage	I_{GSS}	V_{DS}=0V, V_{GS} =±12V			±100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS}=-20V,V_{GS} =0V			-1	μA
Drain-source on-state resistance[a]	$R_{DS(on)}$	V_{GS} =-4.5V, I_D =-4.4A		25	36	mΩ
		V_{GS} =-2.5V, I_D =-3A		35	50	
		V_{GS} =-1.8V,I_D=-2.0A		47	60	
Forward transconductance[a]	g_{fs}	V_{DS} =-5V, I_D =-4.4A	6			S
Dynamic						
Input capacitance[b,c]	C_{iss}	V_{DS} =-4V,V_{GS} =0V,f =1MHz		960		pF
Output capacitance[b,c]	C_{oss}			330		
Reverse transfer capacitance[b,c]	C_{rss}			300		
Total gate charge[b]	Q_g	V_{DS} =-4V,V_{GS} =-4.5V, I_D =-4.4A		20	30	nC
		V_{DS} =-4V,V_{GS} =-2.5V, I_D =-4.4A		12	18	
Gate-source charge[b]	Q_{gs}			15		
Gate-drain charge[b]	Q_{gd}			3.1		
Gate resistance[b,c]	R_g	f =1MHz	1	5.1	10.2	Ω
Turn-on delay time[b,c]	$t_{d(on)}$	V_{DD}=-4V, R_L=1.1Ω, I_D ≈-3.5A, V_{GEN}=-4.5V,Rg=1Ω		20	30	ns
Rise time[b,c]	t_r			20	30	
Turn-off Delay time[b,c]	$t_{d(off)}$			40	60	
Fall time[b,c]	t_f			10	15	
Turn-on delay time[b,c]	$t_{d(on)}$	V_{DD}=-4V, R_L=1.2Ω, I_D ≈-3.3A, V_{GEN}=-8V,Rg=1Ω		10	15	
Rise time[b,c]	t_r			10	15	
Turn-off delay time[b,c]	$t_{d(off)}$			35	55	
Fall time[b,c]	t_f			10	15	
Drain-source body diode characteristics						
Continuous source-drain diode current	I_S	T_C=25℃			-1.4	A
Pulse diode forward current[a]	I_{SM}				-20	
Body ciode voltage	V_{SD}	I_F=-3.5A			-1.2	V

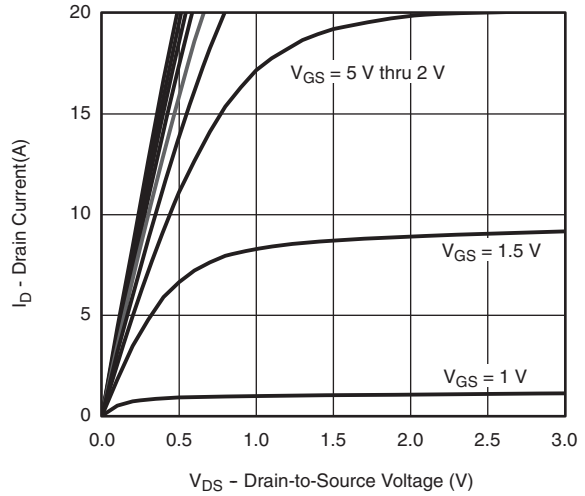
Note :

a. Puls Test ; Pulse Width ≤300μs, Duty Cycle ≤2%.

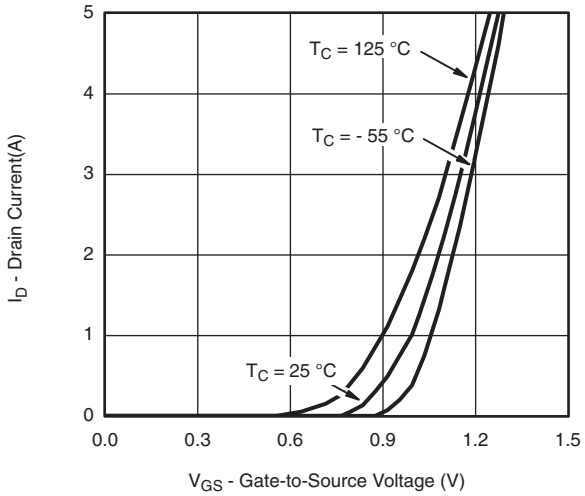
b. Guaranteed by design, not subject to production testing.

c. These parameters have no way to verify.

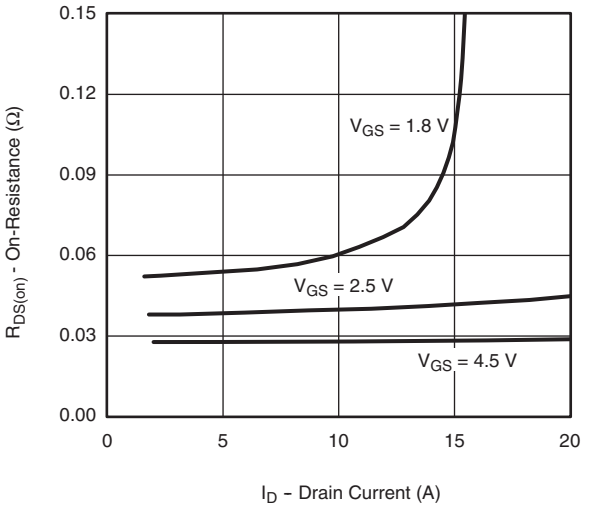
TYPICAL TRANSIENT CHARACTERISTICS



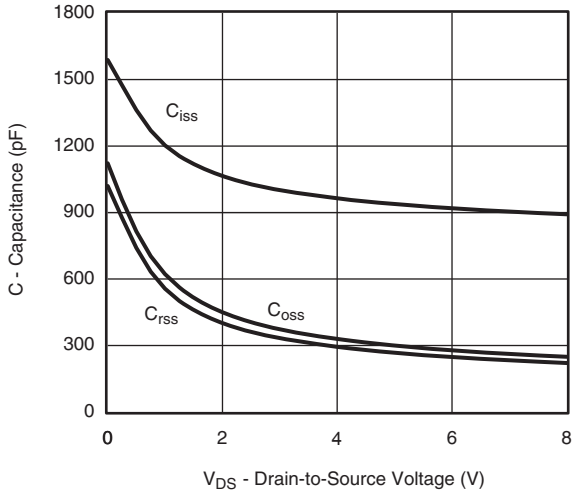
Output Characteristics



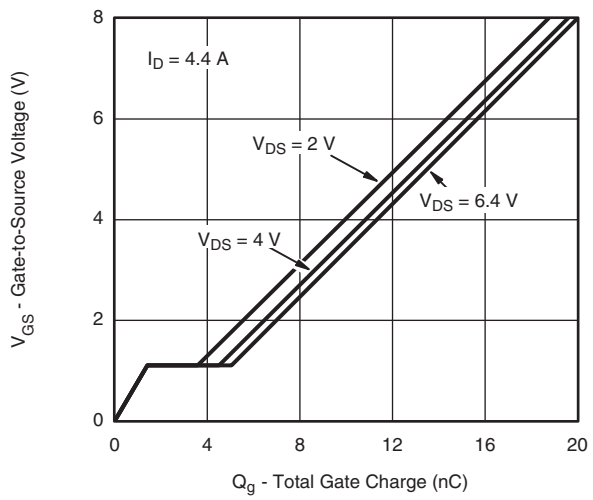
Transfer Characteristics



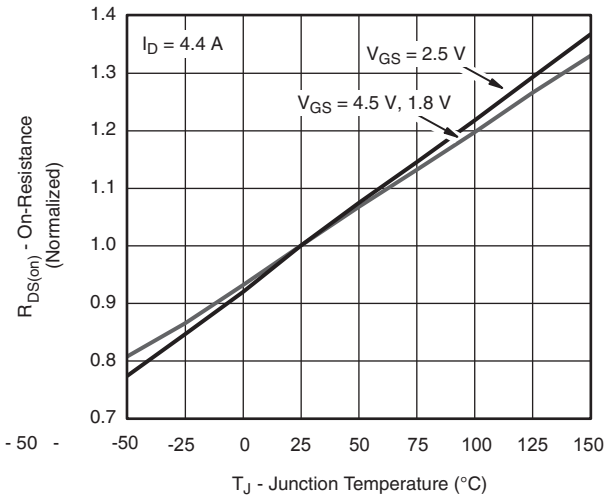
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

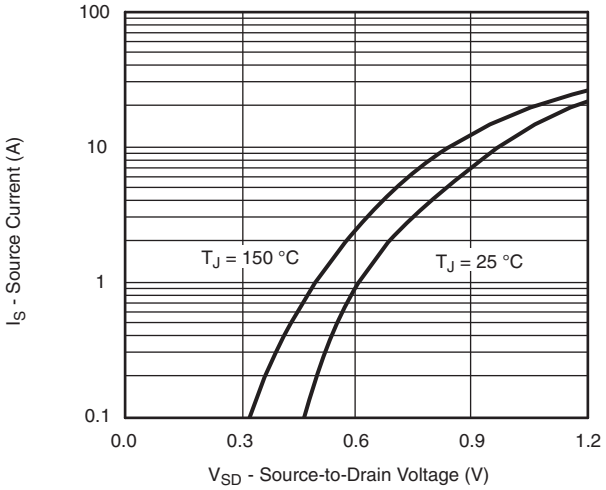


Gate Charge

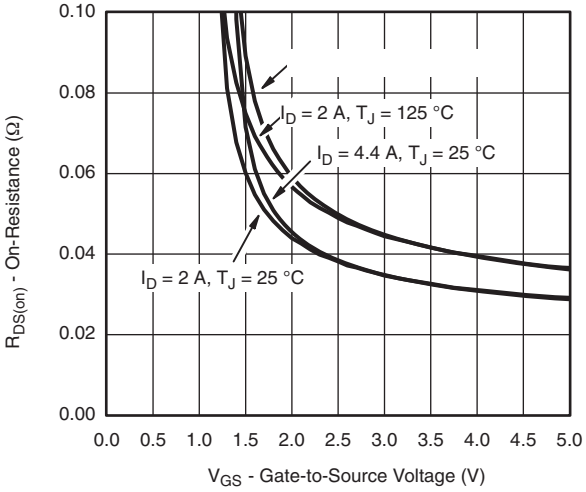


On-Resistance vs. Junction Temperature

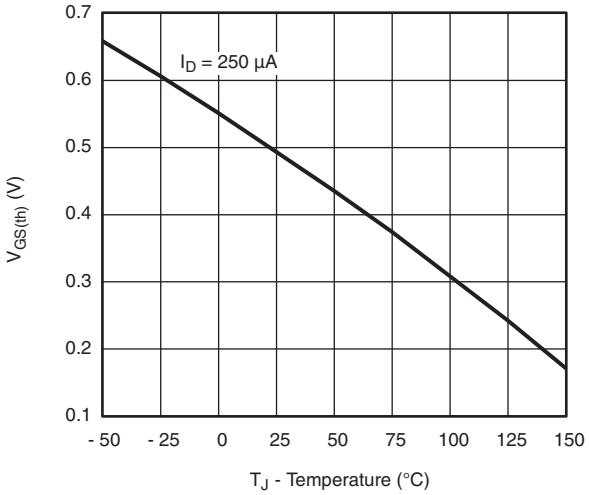
TYPICAL TRANSIENT CHARACTERISTICS



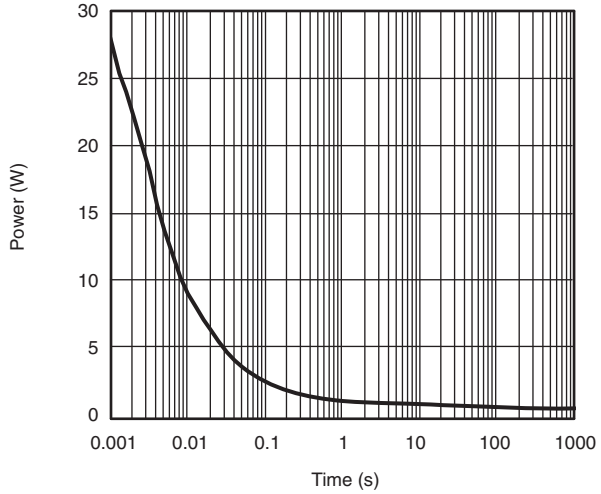
Source-Drain Diode Forward Voltage



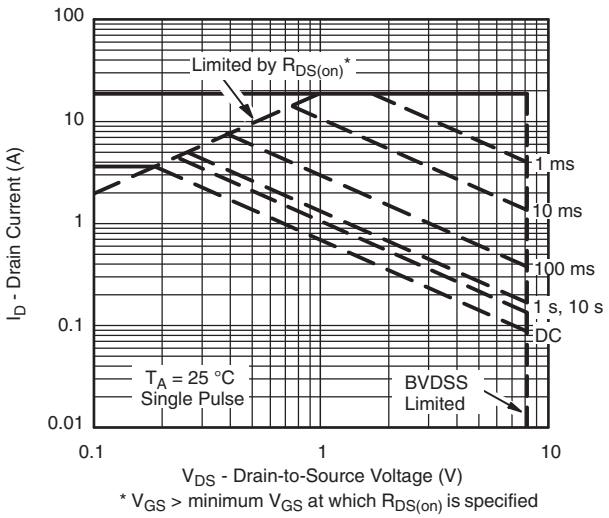
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



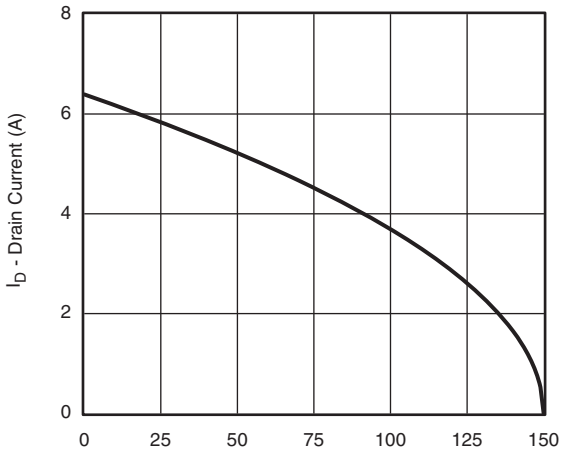
Single Pulse Power, Junction-to-Ambient



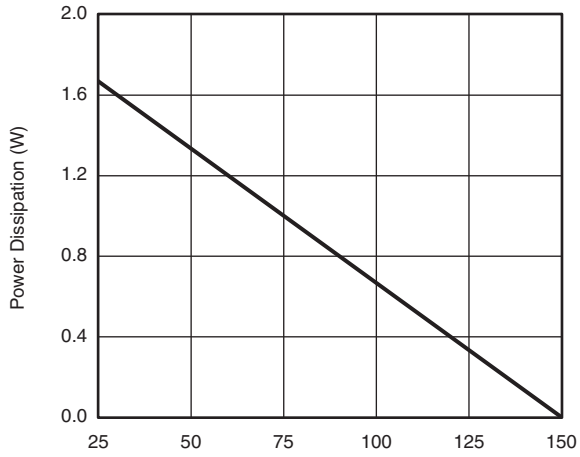
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

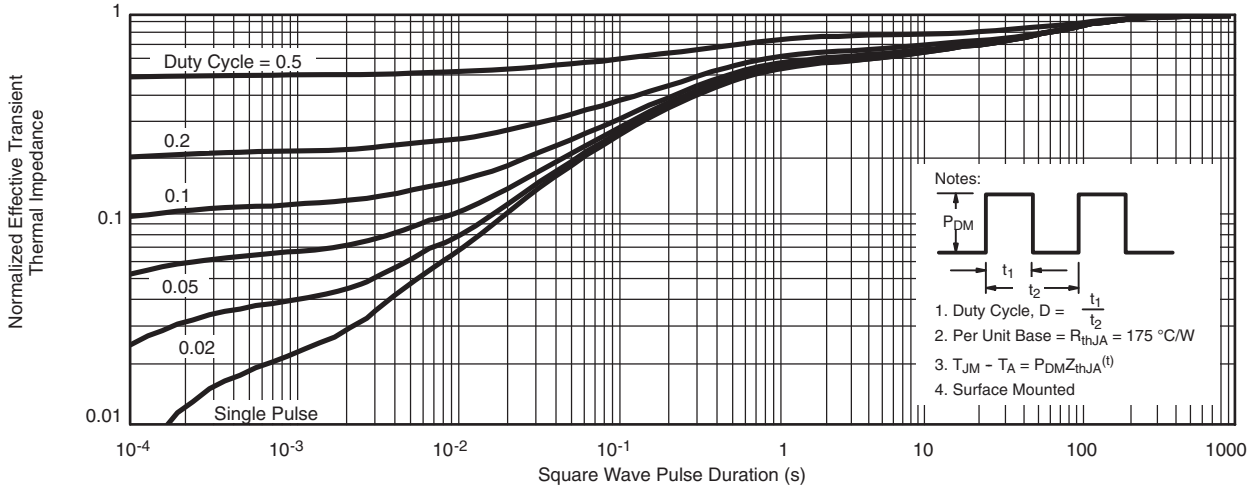
TYPICAL TRANSIENT CHARACTERISTICS



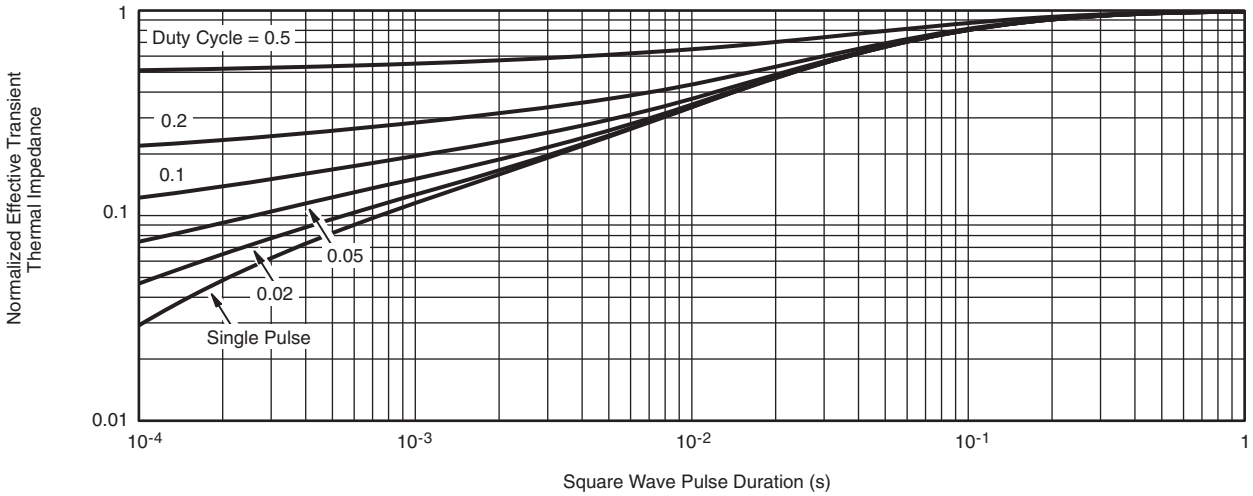
Current Derating*



Power, Junction-to-Case



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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