



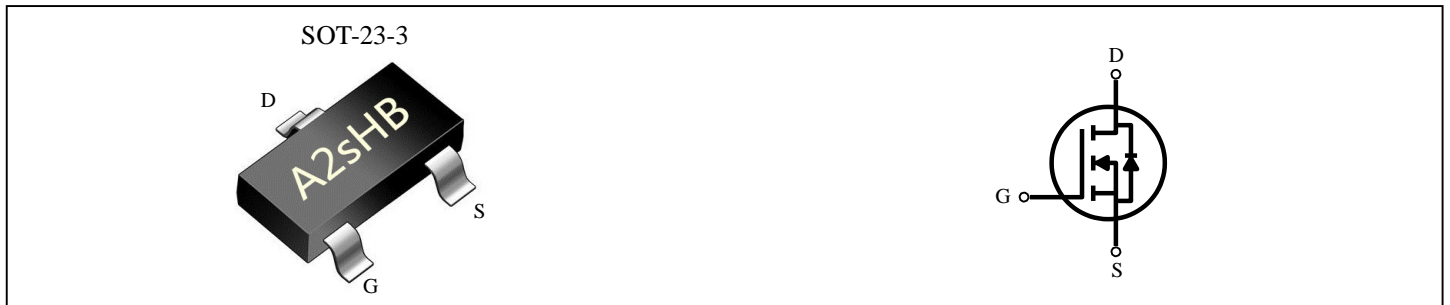
N-Channel High Density Trench MOSFET

PRODUCT SUMMARY

V _{DSS}	I _D	R _{DS(on)} (m-ohm) Max
20V	3.0	65 @ V _{GS} = 4.5V
	2.0	90 @ V _{GS} = 2.5V

FEATURES

- Super high dense cell trench design for low R_{DS(on)}.
- Rugged and reliable.
- Surface Mount package.

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	20	V
Gate-Source Voltage	V _{GS}	±12	V
Drain Current-Continuous ^a @ T _A = 25 °C -Pulse ^b	I _D	3	A
	I _{DM}	9	A
Drain-Source Diode Forward Current ^a	I _S	1	A
Maximum Power Dissipation ^a	P _D	T _A =25 °C	1.25
		T _A =75 °C	0.75
Operating Junction and Storage Temperature Range	T _J , T _{STG}	- 55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	R _{thJA}	100	°C/W
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Note

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

b. Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20V, V_{GS} = 0V$			1	μA
Gate-Body Leakage	I_{GSS}	$V_{GS} = \pm 8V, V_{DS} = 0V$			± 10	μA
ON CHARACTERISTICS^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	0.5	0.7	1	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 2.8A$		50	65	m-ohm
		$V_{GS} = 2.5V, I_D = 2.0A$		65	90	
Forward Transconductance	g_{fs}	$V_{DS} = 5V, I_D = 4A$		10.7		S
DRAIN-SOURCE DIODE CHARACTERISTICS^b						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = 1.7A$			1.2	V
DYNAMIC CHARACTERISTICS^c						
Input Capacitance	C_{ISS}	$V_{DS} = 6V, V_{GS} = 0V$ $f = 1.0MHz$		457		pF
Output Capacitance	C_{OSS}			119		pF
Reverse Transfer Capacitance	C_{RSS}			93		pF
SWITCHING CHARACTERISTICS^c						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD} = 6V, I_D = 1A$ $V_{GEN} = 4.5V$ $R_L = 6\text{ ohm}$ $R_{GEN} = 6\text{ ohm}$		4	8	ns
Rise Time	t_r			14	26	ns
Turn-Off Delay Time	$t_{D(OFF)}$			21	39	ns
Fall Time	t_f			7.2		ns
Total Gate Charge	Q_g	$V_{DS} = 6V$		13		nC
Gate-Source Charge	Q_{gs}	$I_D = 2.8A$		4.1		nC
Gate-Drain Charge	Q_{gd}	$V_{GS} = 4.5V$		2.9		nC

Note

b. Pulse Test Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

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

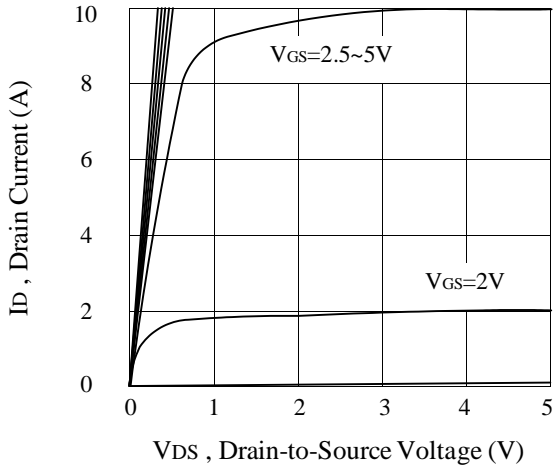


Figure 1. Output Characteristics

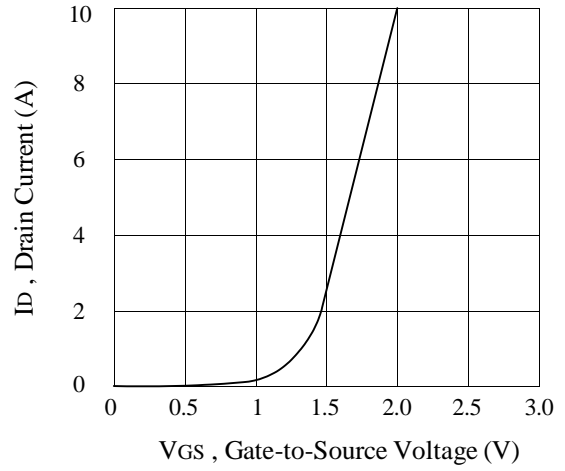


Figure 2. Transfer Characteristics

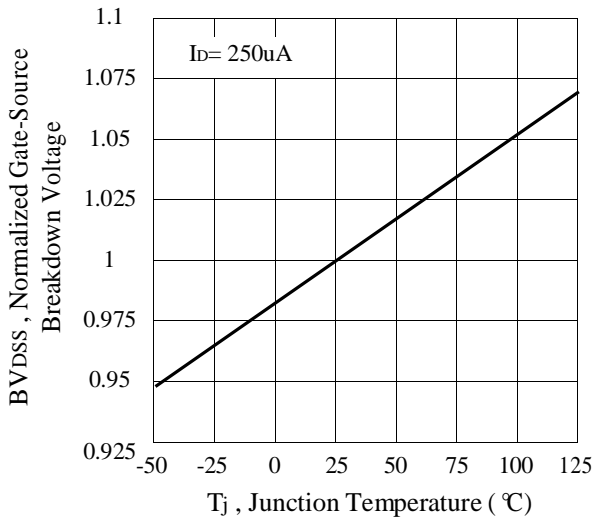


Figure 3. Breakdown Voltage Variation with Temperature

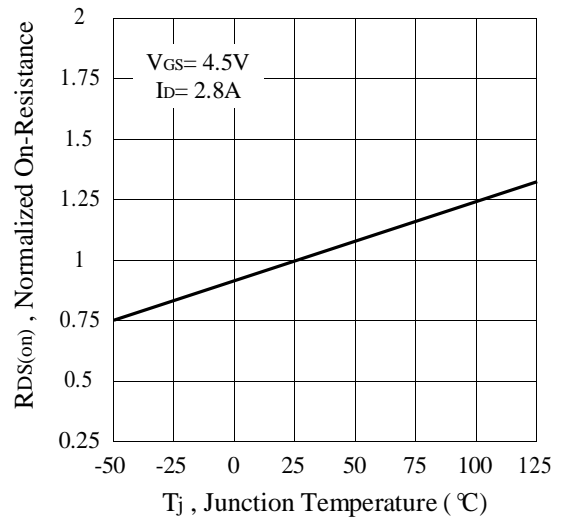


Figure 4. On-Resistance Variation with Temperature

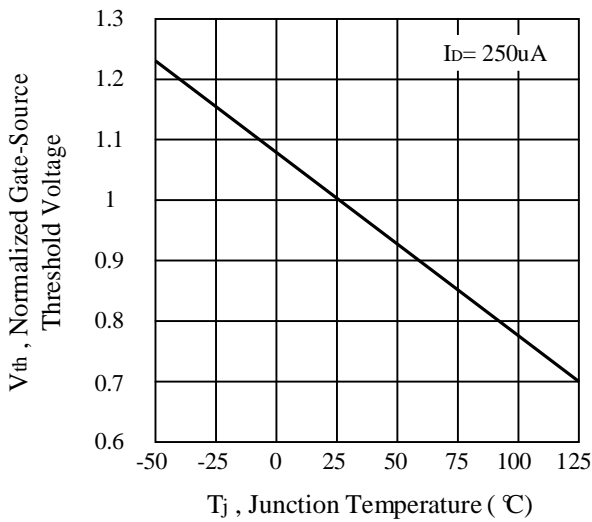


Figure 5. Gate Threshold Variation with Temperature

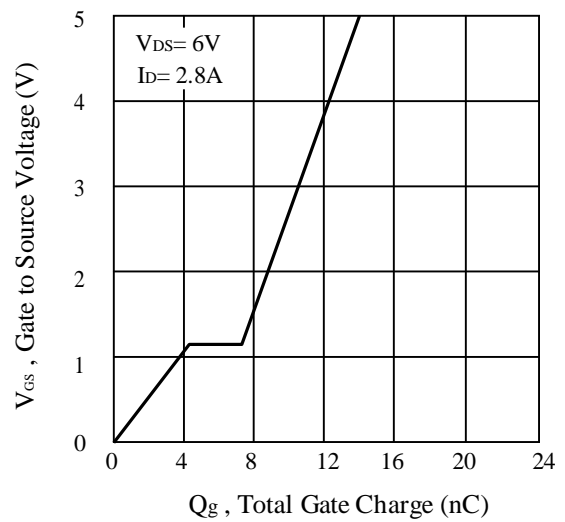


Figure 6. Gate Charge

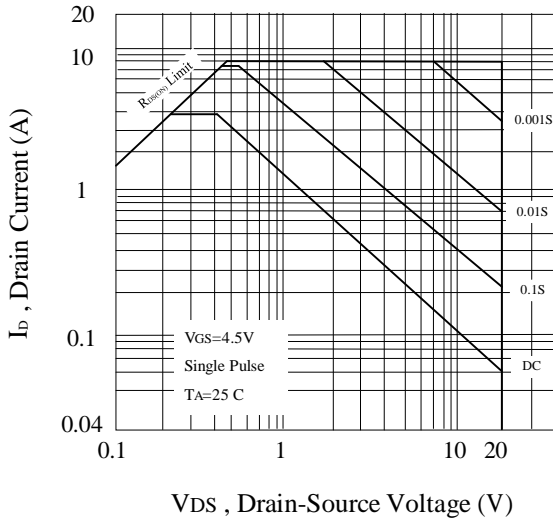


Figure 7. Maximum Safe Operating Area

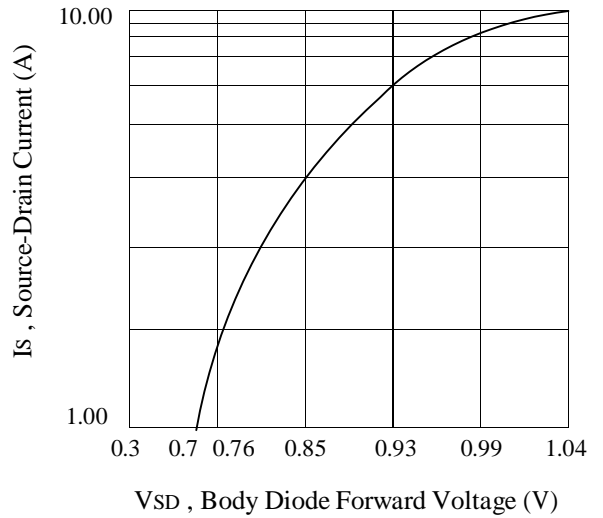


Figure 8. Body Diode Forward Voltage Variation with Source Current

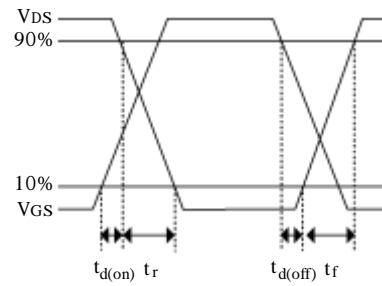
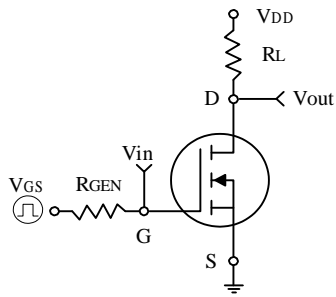


Figure 9. Switching Test Circuit and Switching Waveforms

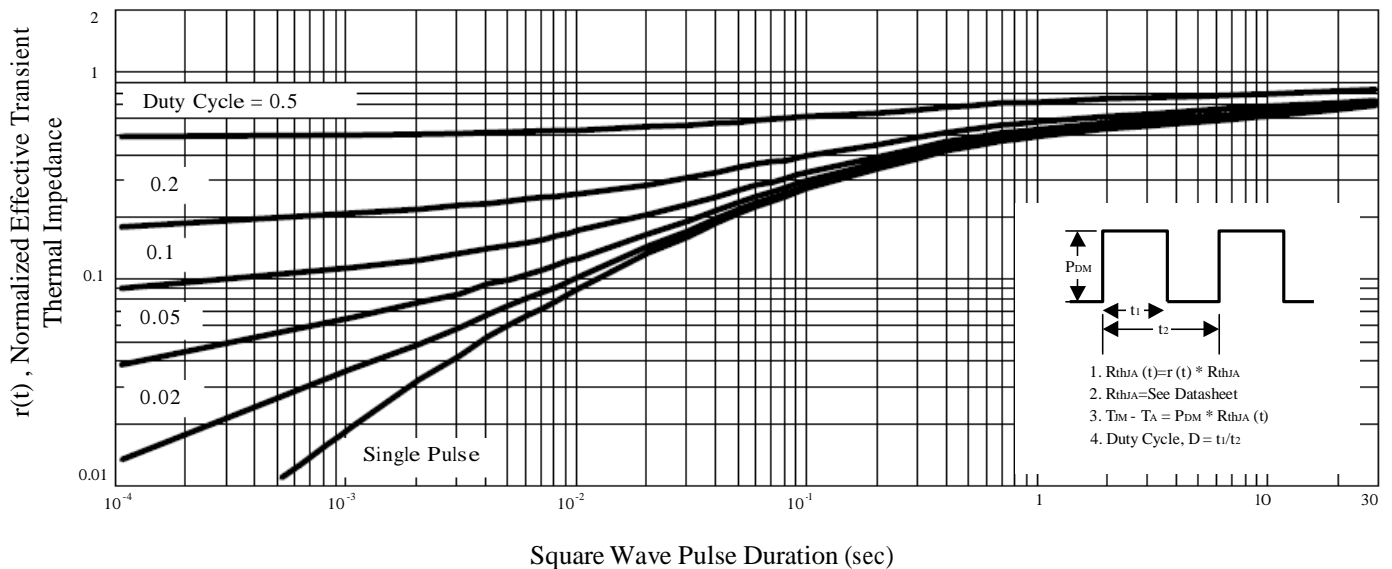


Figure 10. Normalized Thermal Transient Impedance Curve