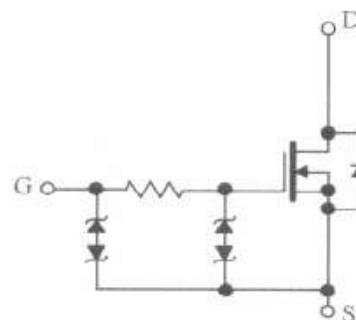


N-Channel High Density Trench MOSFET

FEATURES

- Super high dense cell trench design for low $R_{DS(on)}$.
- Rugged and reliable.
- ESD Protected 2KV.

SOT-23-3L



PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (m Ω) Max
20V	5.6A	25 @ $V_{GS} = 4.5V$
	4.5A	33 @ $V_{GS} = 2.5V$

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ 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 @ $T_A = 25^\circ C$ -Pulse ^b	I_D	5.8	A
	I_{DM}	24	A
Drain-Source Diode Forward Current ^a	I_S	1.7	A
Maximum Power Dissipation ^a	P_D	1.25	W
		0.75	
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	$R_{\theta JA}$	100	$^\circ C/W$
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Note :

a. Surface Mounted on FR4 Board, 1s/10sec

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

c. 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 = 250uA	20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 16V , V _{GS} = 0V			1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} = ±12V , V _{DS} = 0V			±10	uA
ON CHARACTERISTICS ^b						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250uA	0.6	0.8	1	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} = 4.5V , I _D = 5.6A		20	25	mΩ
		V _{GS} = 2.5V , I _D = 4.5A		26	33	
Forward Transconductance	g _s	V _{DS} = 10V , I _D = 5A		18.5		S
DRAIN-SOURCE DIODE CHARACTERISTICS ^b						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V , I _S = 1.5A		0.7	1.2	V
DYNAMIC CHARACTERISTICS ^c						
Input Capacitance	C _{iss}	V _{DS} = 10V , V _{GS} = 0V f = 1.0MHz		345		pF
Output Capacitance	C _{oss}			128		pF
Reverse Transfer Capacitance	C _{rss}			36		pF
SWITCHING CHARACTERISTICS ^c						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = 10V , I _D = 2A V _{GEN} = 4.5V R _L = 5 ohm R _{GEN} = 6 ohm		372		ns
Rise Time	t _r			840		ns
Turn-Off Delay Time	t _{D(OFF)}			3978		ns
Fall Time	t _f			2145		ns
Total Gate Charge	Q _g	V _{DS} = 12V I _D = 3A V _{GS} = 4.5V		5.2		nC
Gate-Source Charge	Q _{gs}			2.8		nC
Gate-Drain Charge	Q _{gd}			1.7		nC

Note :

b. Pulse Test : Pulse width $\leq 30ms$, Duty Cycle $\leq 2\%$

c. Guaranteed by design, not subject to production testing

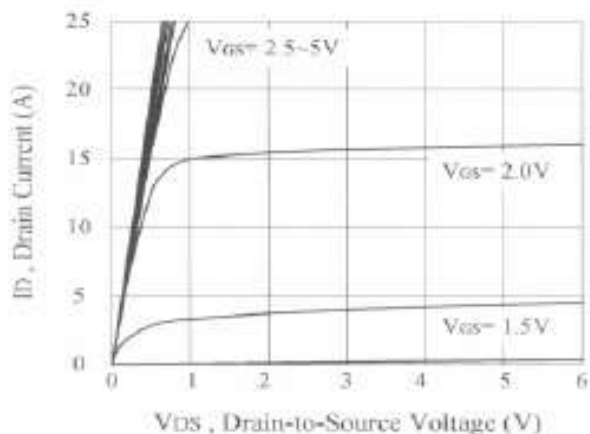


Figure 1. Output Characteristics

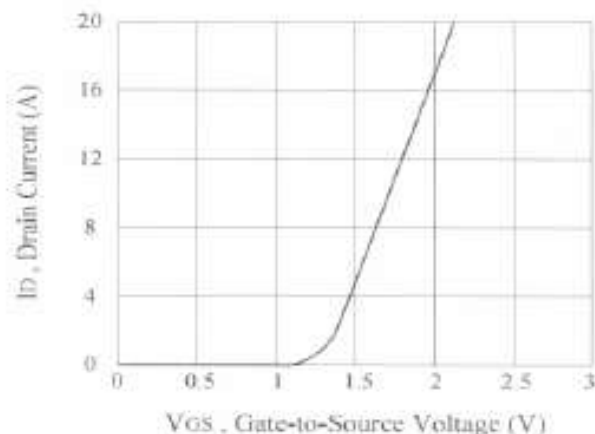


Figure 2. Transfer Characteristics

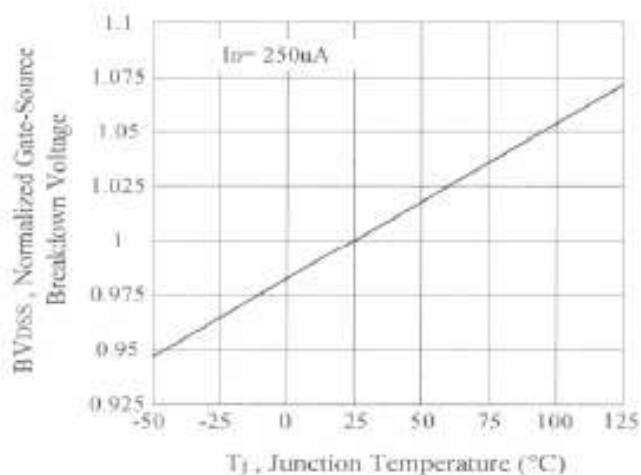


Figure 3. Breakdown Voltage Variation with Temperature

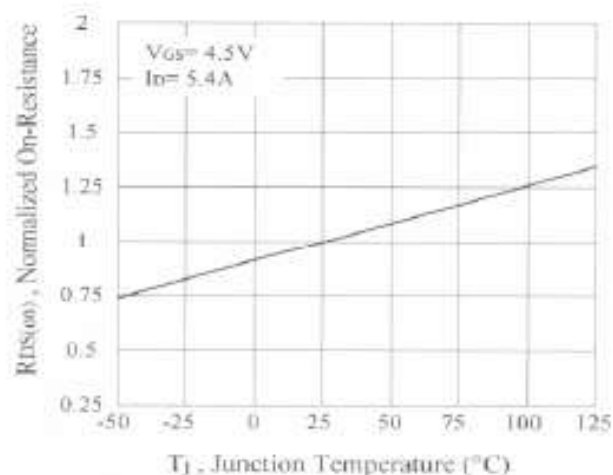


Figure 4. On-Resistance Variation with Temperature

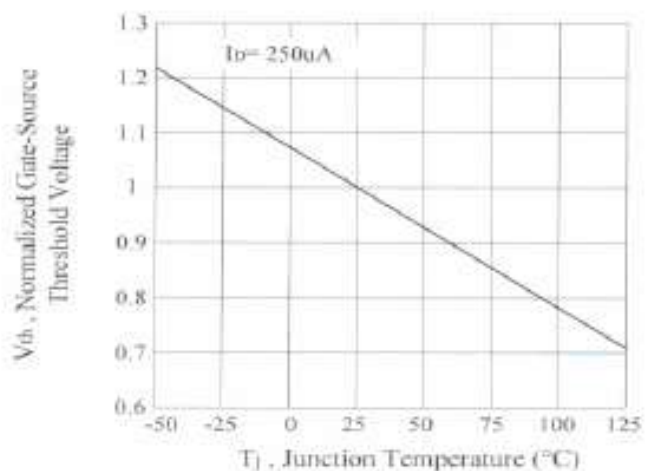


Figure 5. Gate Threshold Variation with Temperature

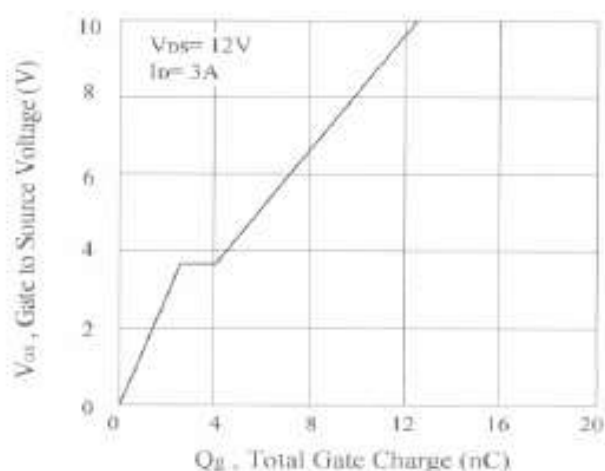
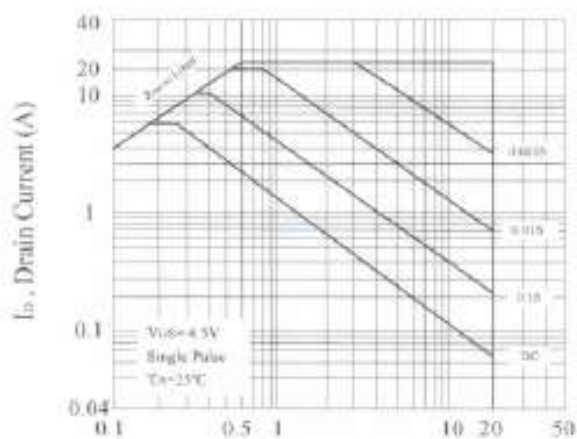
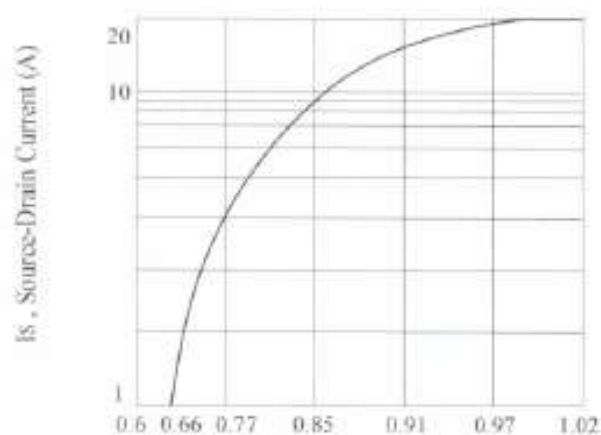


Figure 6. Gate Charge



VDS, Drain-Source Voltage (V)
 Figure 7. Maximum Safe Operating Area



VSD, Body Diode Forward Voltage (V)
 Figure 8. Body Diode Forward Voltage Variation with Source Current

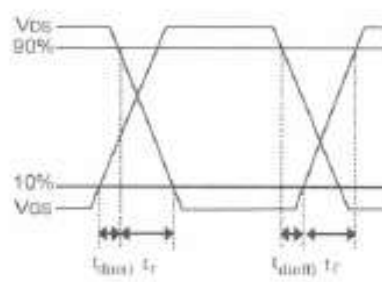
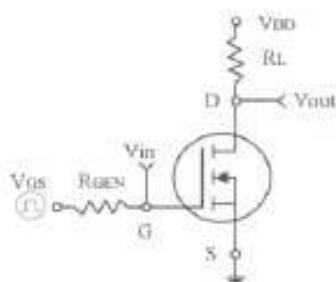


Figure 9. Switching Test Circuit and Switching Waveforms

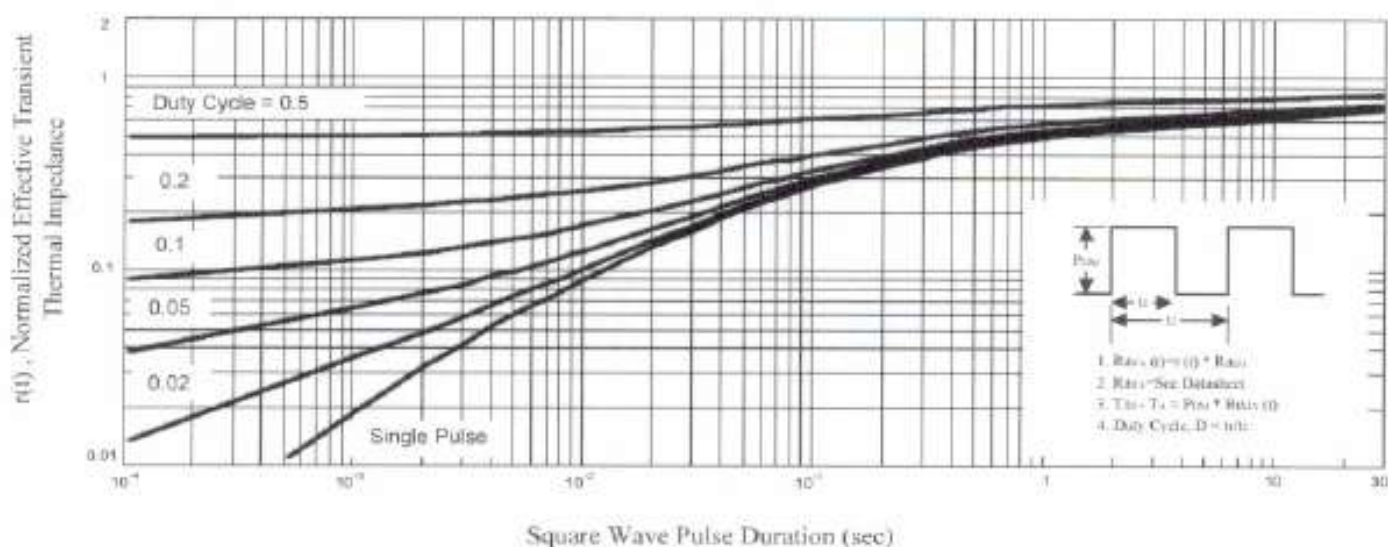


Figure 10. Normalized Thermal Transient Impedance Curve