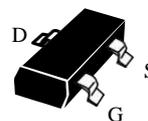


P-Channel High Density Trench MOSFET

Features:

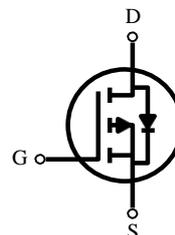
- Super high dense cell trench design for low $R_{DS(on)}$.
- Rugged and reliable.
- Surface Mount package.

SOT-23-3L



PRODUCT SUMMARY

V_{DSS}	I_D	$R_{DS(on)}$ (m-ohm) Max
-20V	-6.A	24@ $V_{GS} = 4.5V$
	-4.8 A	28@ $V_{GS} = 2.5V$



ABSOLUTE MAXIMUM RATINGS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 8	V
Drain Current-Continuous ^a @ $T_A = 25\text{ }^\circ\text{C}$ -Pulse ^b	I_D	-6	A
	I_{DM}	-24	A
Maximum Power Dissipation ^a	P_D	1.25	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	- 55 to 150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient ^a	R_{thJA}	62.5	$^\circ\text{C/W}$
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Note

a. Surface Mounted on FR4 Board , $t \leq 10\text{sec}$.

b. Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS (T_A = 25 °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} = -30V , V _{GS} = 0V			-1	uA
Gate-Body Leakage Current, Forward	I _{GSSF}	V _{GS} = 12V , V _{DS} = 0V			100	nA
Gate Body Leakage Current, Reverse	I _{GSSR}	V _{GS} = -12V, V _{DS} = 0V			-100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250uA	-0.4	-0.55	-0.67	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = -4.5V, I _D = -4.8A		18	24	mΩ
		V _{GS} = -2.5V , I _D = -3.5A		23	28	mΩ
		V _{GS} = -1.8V , I _D = -1.2A		31	40	mΩ
DYNAMIC CHARACTERISTICS						
Forward Transconductance	g _{FS}	V _{DS} = -10V, I _D = -4A		4		S
Input Capacitance	C _{ISS}	V _{DS} = -15V , V _{GS} = 0V f = 1.0MHz		875		pF
Output Capacitance	C _{OSS}			238		pF
Reverse Transfer Capacitance	C _{RSS}			183		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = -15V , I _D = 4A V _{GEN} = -10V R _{GEN} = 6 ohm		11	28	ns
Rise Time	t _r			6	18	ns
Turn-Off Delay Time	t _{D(OFF)}			32	75	ns
Fall Time	t _f			8	18	ns
Total Gate Charge	Q _g	V _{DS} = 15V I _D = -4A V _{GS} = -4.5V		7.5	10.5	nC
Gate-Source Charge	Q _{gs}			3.2	48	nC
Gate-Drain Charge	Q _{gd}			1.7	3.1	nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Forward Current ^b	I _S				-4	A
Drain-Source Diode Forward Voltage ^c	V _{SD}	V _{GS} = 0V, I _S = -1A		-0.7	-1.3	V

Note

b. Pulse Test Pulse width ≤ 300us , Duty Cycle ≤ 2% .

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

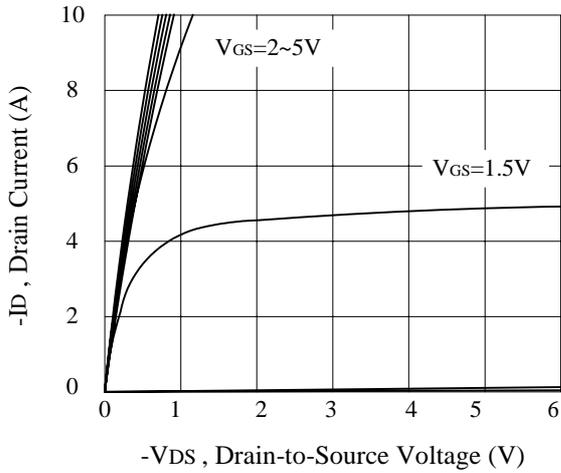


Figure 1. Output Characteristics

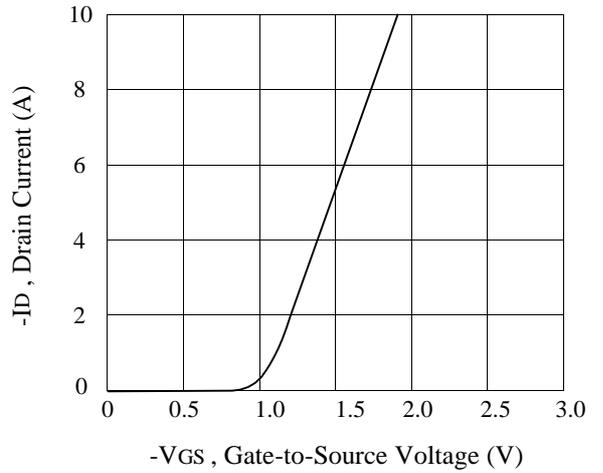


Figure 2. Transfer Characteristics

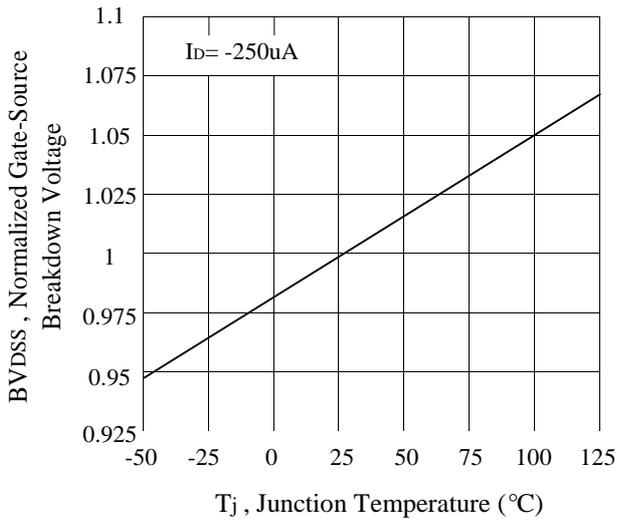


Figure 3. Breakdown Voltage Variation with Temperature

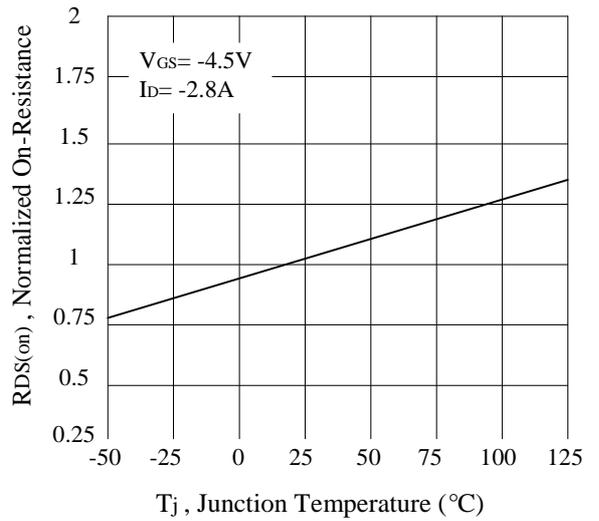


Figure 4. On-Resistance Variation with Temperature

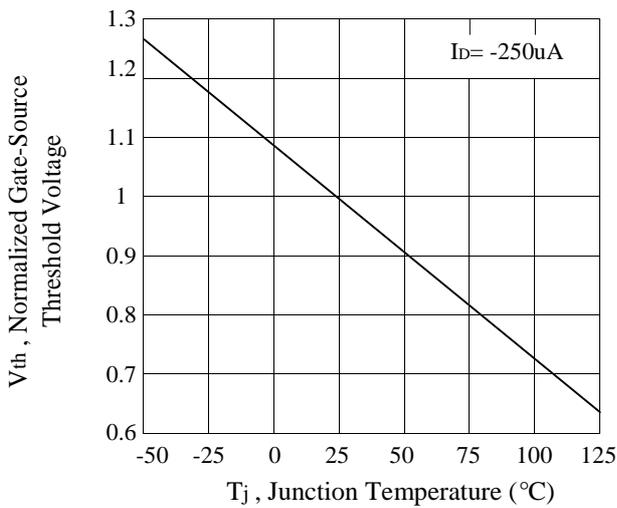


Figure 5. Gate Threshold Variation with Temperature

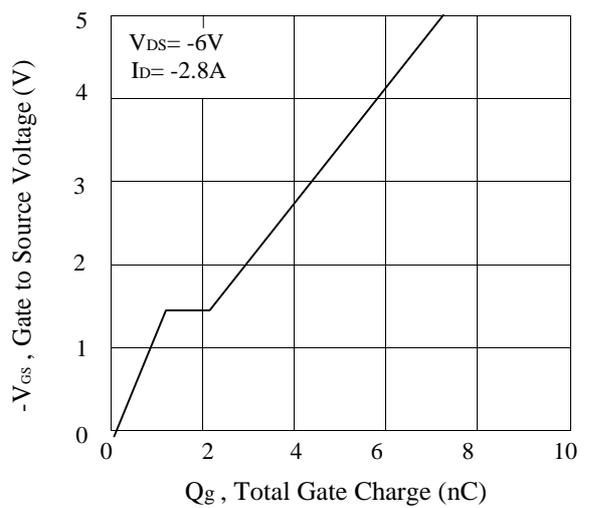
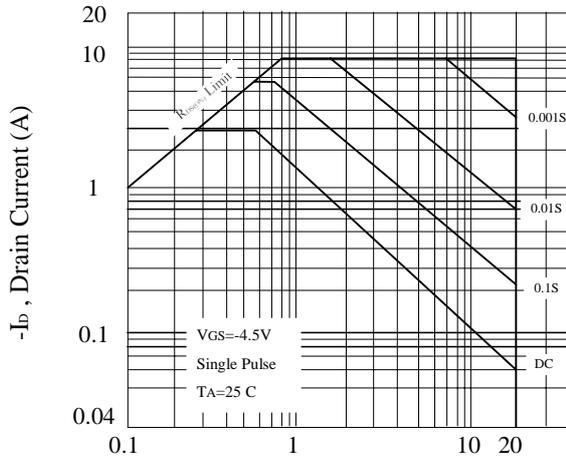
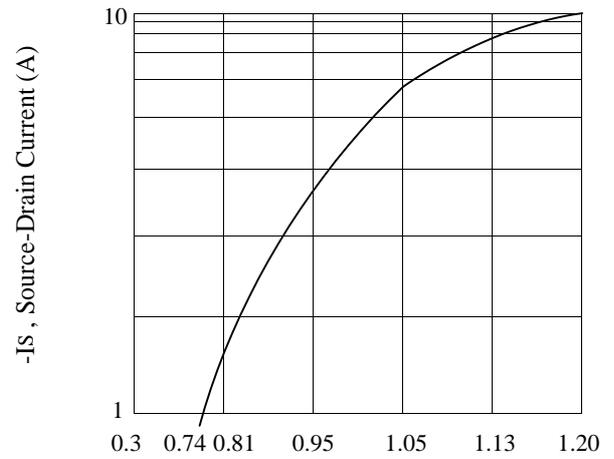


Figure 6. Gate Charge



-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

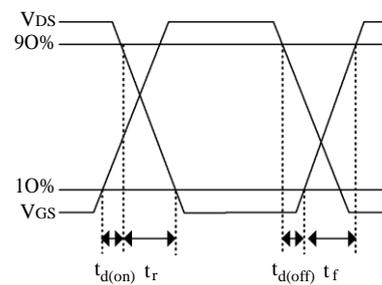
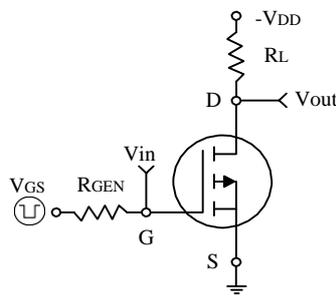


Figure 9. Switching Test Circuit and Switching Waveforms

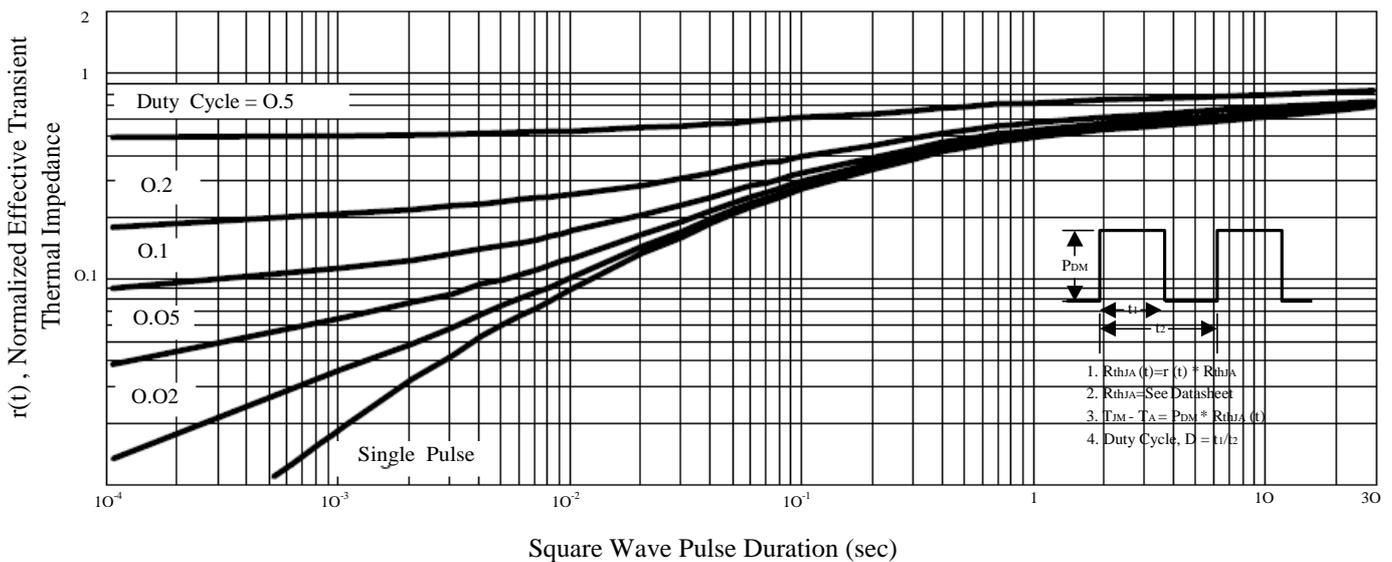


Figure 10. Normalized Thermal Transient Impedance Curve