

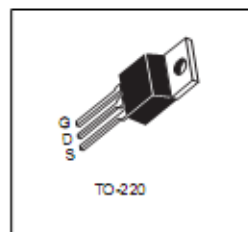
N-Channel Enhancement Mode Field Effect Transistor

600V N-Channel Enhancement-Mode MOSFET

$V_{DS} = 600V$

$R_{DS(ON)}, V_{GS}@10V, I_{DS}@1A = 3.8$

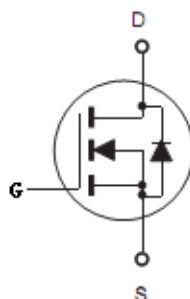
L2N600



FEATURES

- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handling capability.
- Lead free product is acquired.
- TO-220 full-pak for through hole.

We declare that the material of product compliance with RoHS requirements.



ABSOLUTE MAXIMUM RATINGS $T_C = 25^\circ C$ unless otherwise noted

Parameter	Symbol	Limit	Units
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	± 30	V
Drain Current-Continuous	I_D	2	A
Drain Current-Pulsed ^a	I_{DM}^f	6	A
Maximum Power Dissipation @ $T_C = 25^\circ C$ - Derate above $25^\circ C$	P_D	60	W
		0.48	W/ $^\circ C$
Single Pulsed Avalanche Energy ^d	E_{AS}	125	mJ
Repetitive Avalanche Current ^a	I_{AR}	2	A
Repetitive Avalanche Energy ^a	E_{AR}	5.4	mJ
Operating and Store Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ C$

Thermal Characteristics

Parameter	Symbol	Limit		Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.1	4.3	$^\circ C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	65	$^\circ C/W$

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Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	600			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 600V, V_{GS} = 0V$			25	μA
Gate Body Leakage Current, Forward	I_{GSSF}	$V_{GS} = 30V, V_{DS} = 0V$			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	$V_{GS} = -30V, V_{DS} = 0V$			-100	nA
On Characteristics ^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = 250\mu A$	2		4	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 1A$		3.8	5.0	Ω
Forward Transconductance	g_{FS}	$V_{DS} = 50V, I_D = 1A$		1.2		S
Dynamic Characteristics ^c						
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 1.0\text{ MHz}$		250		pF
Output Capacitance	C_{oss}			50		pF
Reverse Transfer Capacitance	C_{rss}			30		pF
Switching Characteristics ^c						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 300V, I_D = 2A, V_{GS} = 10V, R_{GEN} = 18\Omega$		18	35	ns
Turn-On Rise Time	t_r			18	35	ns
Turn-Off Delay Time	$t_{d(off)}$			50	90	ns
Turn-Off Fall Time	t_f	$V_{DS} = 480V, I_D = 2A, V_{GS} = 10V$		16	40	ns
Total Gate Charge	Q_g			20	25	nC
Gate-Source Charge	Q_{gs}			2		nC
Gate-Drain Charge	Q_{gd}			12		nC
Drain-Source Diode Characteristics and Maximun Ratings						
Drain-Source Diode Forward Current	I_S ^g				2	A
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{GS} = 0V, I_S = 2A$ ^h			1.5	V

Notes :

a.Repetitive Rating : Pulse width limited by maximum junction temperature .

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

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

d.L = 60mH, $I_{AS} = 2.0A$, $V_{DD} = 50V$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$.

e.Limited only by maximum temperature allowed .

f.Pulse width limited by safe operating area .

g.Full package $I_{S(max)} = 1.5A$.

h.Full package V_{SD} test condition $I_S = 1.5A$.

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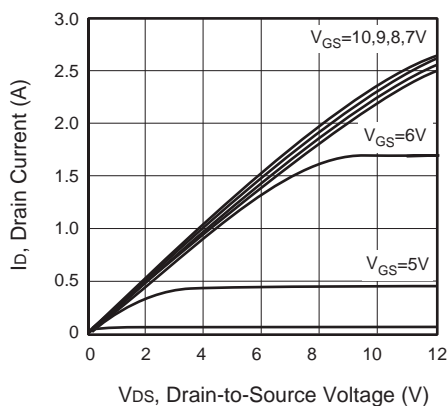


Figure 1. Output Characteristics

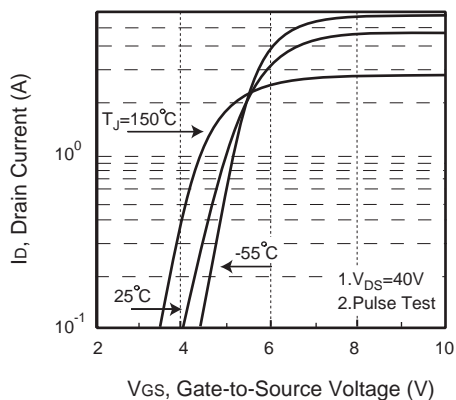


Figure 2. Transfer Characteristics

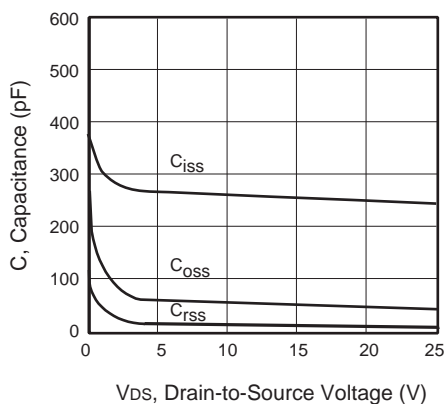


Figure 3. Capacitance

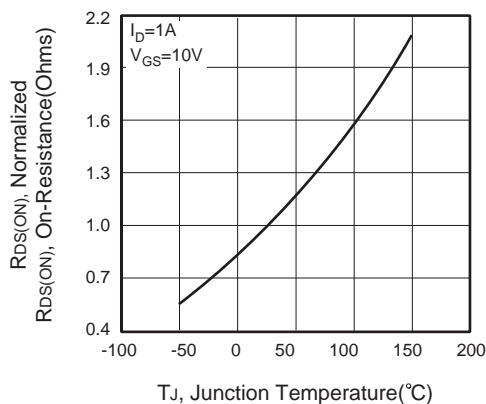


Figure 4. On-Resistance Variation with Temperature

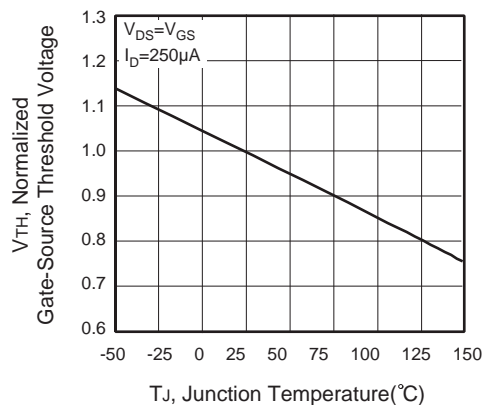


Figure 5. Gate Threshold Variation with Temperature

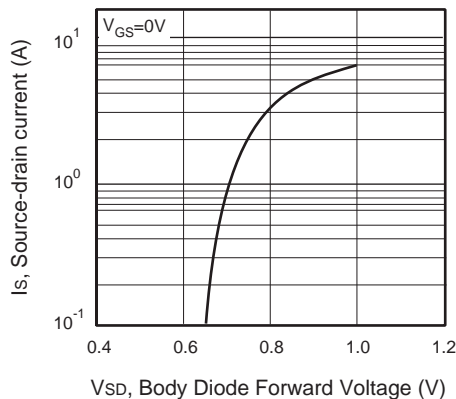


Figure 6. Body Diode Forward Voltage Variation with Source Current

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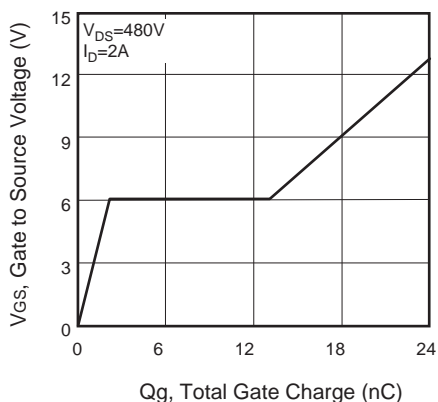


Figure 7. Gate Charge

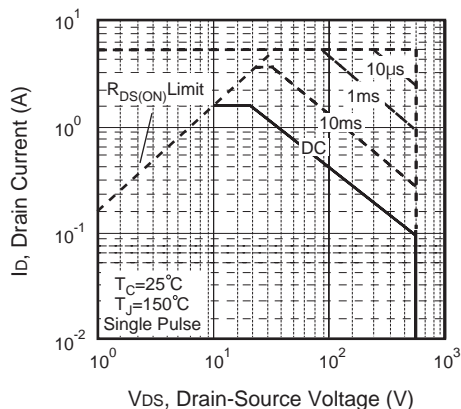


Figure 8. Maximum Safe Operating Area

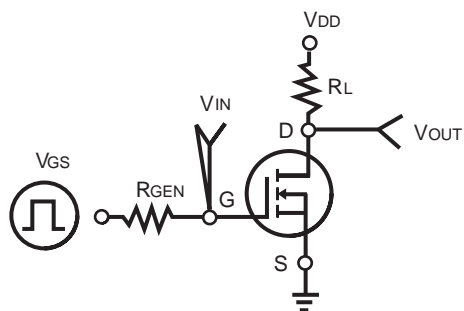


Figure 9. Switching Test Circuit

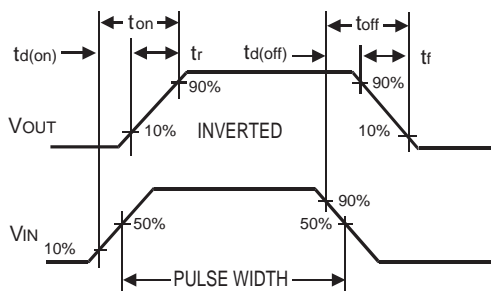


Figure 10. Switching Waveforms

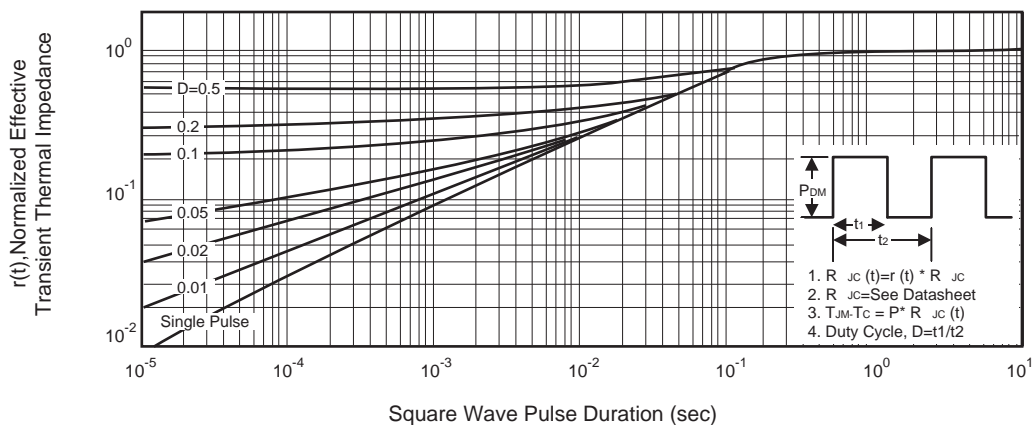
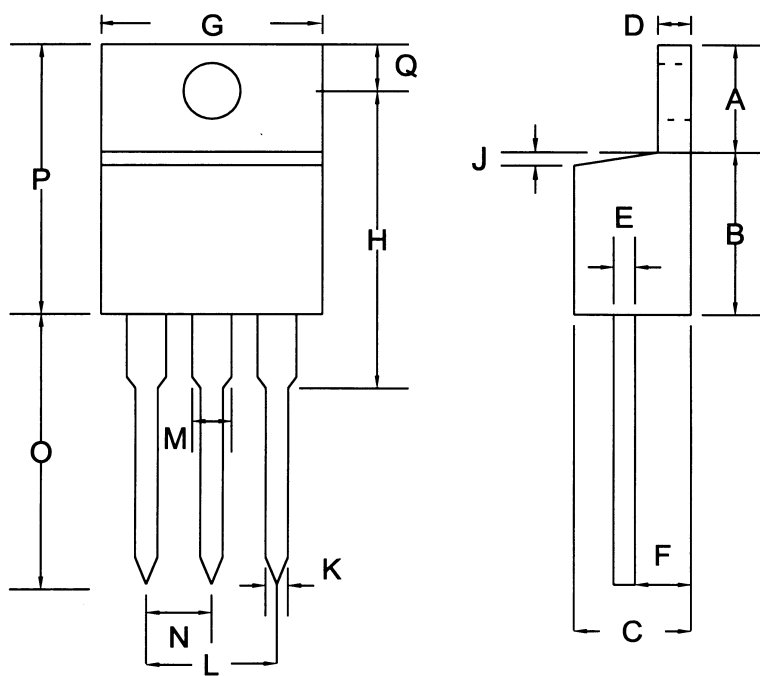


Figure 11. Normalized Thermal Transient Impedance Curve

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Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min	Nom	Max	Min	Nom	Max
A	5.58	6.54	7.49	0.220	0.257	0.295
B	8.38	8.64	8.90	0.330	0.340	0.350
C	4.07	4.45	4.82	0.160	0.175	0.190
D	1.15	1.27	1.39	0.045	0.050	0.055
E	0.35	0.45	0.60	0.014	0.018	0.024
F	2.04	2.42	2.79	0.080	0.095	0.110
G	9.66	9.97	10.28	0.380	0.393	0.405
H	—	16.25	—	—	0.640	—
I	3.68	3.83	3.98	0.145	0.151	0.157
J	—	—	1.27	—	—	0.050
K	0.75	0.85	0.95	0.030	0.033	0.037
L	4.83	5.08	5.33	0.190	0.200	0.210
M	1.15	1.33	1.52	0.045	0.052	0.060
N	2.42	2.54	2.66	0.095	0.100	0.105
O	12.70	13.48	14.27	0.500	0.531	0.562
P	14.48	15.17	15.87	0.570	0.597	0.625
Q	2.54	2.79	3.04	0.100	0.110	0.120