

FEATURES

| $V_{DS}=80V, I_D=220A^{(1)}$ $R_{DS(ON)_{typ}} : 1.1m\Omega @ V_{GS}=10V^{(1)}$

| Ultra-Low $R_{DS(ON)}$

| Low Gate Charge

| High Current Capability

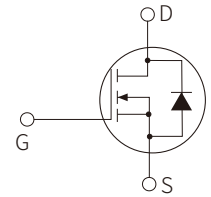


APPLICATION

| Power Management in Telecom., Industrial Automation

| Motor Driving in Power Tool, E-vehicle, Robotics

| Current Switching in DC/DC & AC/DC (SR) Sub-systems



Schematic Symbol

APPROVALS

RoHS | Compliance with 2011/65/EU

HF | Compliance with IEC61249-2-21:2003

ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	80	V
Continuous Drain Current	I_D	220	A
Single Pulsed Avalanche Energy ⁽²⁾	E_{AS}	1056	mJ
Gate-Source Voltage	V_{GSS}	± 20	V
Power Dissipation	P_D	$T_c=25^\circ C$	W
		$T_c=100^\circ C$	
Junction & Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.35	$^\circ C/W$
Thermal Resistance, Junction to Ambient ⁽³⁾	$R_{\theta JA}$	35	$^\circ C/W$

ELECTRICAL CHARACTERISTICS (T_A=25°C)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V,I _{DS} =250μA	80			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _{DS} =250μA	2.0	3.0	4.0	V
Drain Leakage Current	I _{DSS}	V _{DS} =80V,V _{GS} =0V			1	μA
Gate Leakage Current	I _{GSS}	V _{GS} =±20V,V _{DS} =0V			±100	nA
On-State Resistance ⁽⁴⁾	R _{DS(on)}	V _{GS} =10V,I _D =20A		1.1	1.35	mΩ
Gate Poly Resistance	R _g	V _{GS} =0V,V _{DS} =0V,f=1MHz		3.9		Ω
Dynamic Characteristics						
Total Gate Charge	Q _g	V _{GS} = 0 to 10V V _{DS} =40V,I _D =20A	143	200	270	nC
Gate Source Charge	Q _{gs}		49	68	92	nC
Gate Drain("Miller") Charge	Q _{gd}		30	41	56	nC
Input capacitance	C _{iss}	V _{GS} =0V,V _{DS} =30V, f=1MHz		15000		pF
Output capacitance	C _{oss}			2600		pF
Reverse transfer capacitance	C _{rss}			60		pF
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =40V,V _{GS} =10V I _D =20A,R _{GEN} = 3Ω		33		nS
Turn-on Rise Time	t _r			54		nS
Turn-Off Delay Time	t _{d(off)}			138		nS
Turn-Off Fall Time	t _f			73		nS
Drain-Source Diode Characteristics and Max Ratings						
Drain to Source Diode Forward Voltage	V _{SD}	I _S =20A,V _{GS} =0V			1.2	V
Maximum Continuous Body Diode Forward Current	I _S				383	A
Maximum Pulsed Body Diode Forward Current	I _{SM}				1530	A
Body Diode Reverse Recovery Time	t _{rr}	I _F =20A, dI/dt=100A/μs	82	115	156	ns
Body Diode Reverse Recovery Charge	Q _{rr}			331		nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. EAS condition: Starting T_J=25C, V_{DD}=40V, V_{GS}=10V, R_G=25ohm, L=3mH, I_{AS}=37.1A, V_{DD}=0V during time in avalanche.
3. R_{θJA} is measured with the device mounted on a 1inch2 pad of 2oz copper FR4 PCB.
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

PARAMETER CHARACTERISTIC CURVE

Fig 1: Power De-rating

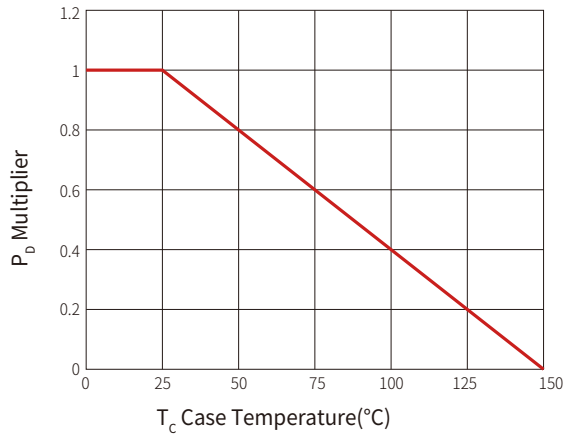


Figure 2: Current De-rating

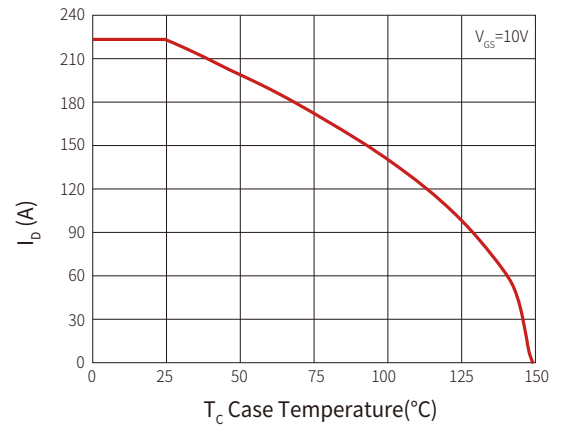


Figure 3: Normalized Maximum Transient Thermal Impedance

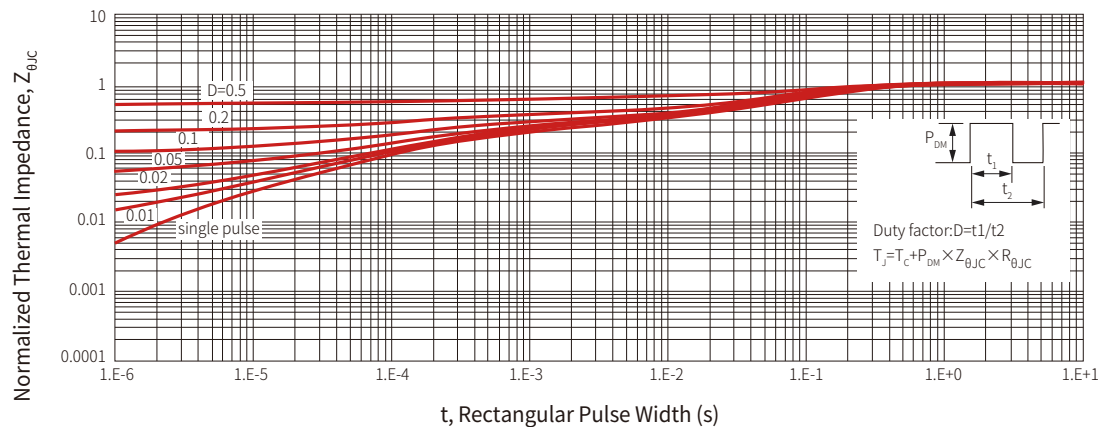


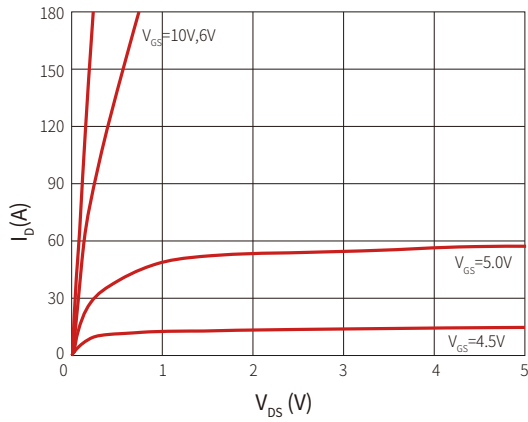
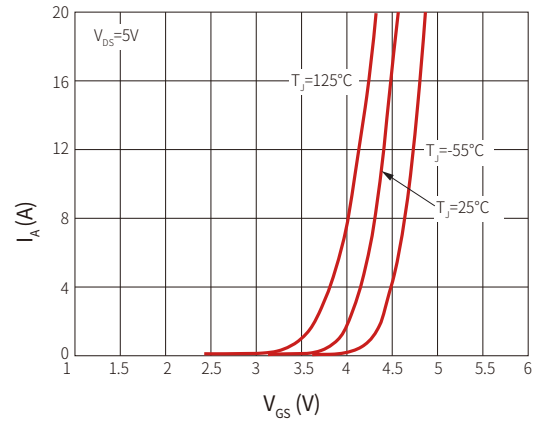
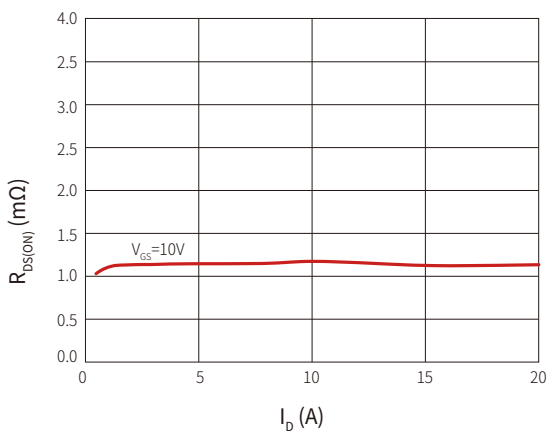
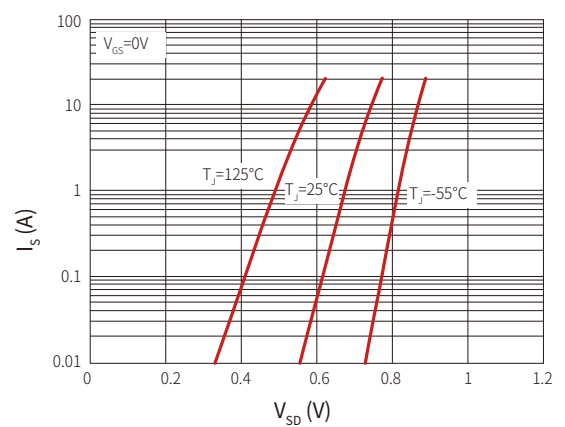
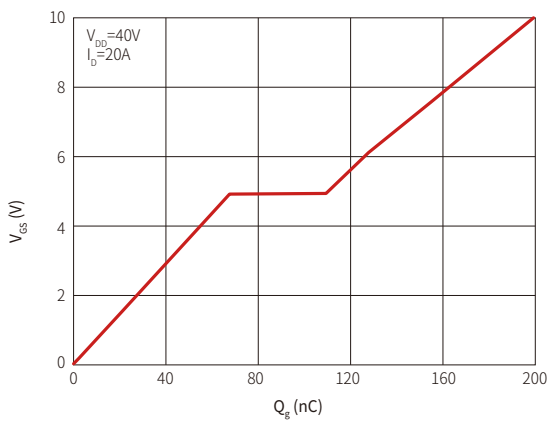
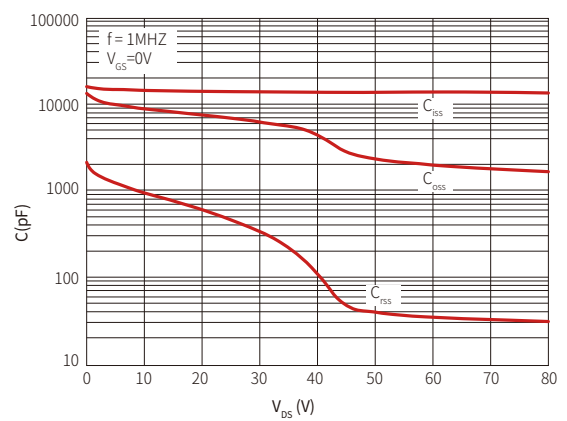
Figure 4: Output Characteristics

Figure 5: Typical Transfer Characteristics

Figure 6: On-resistance vs. Drain Current

Figure 7: Body Diode Characteristics

Figure 8: Gate Charge Characteristics

Figure 9: Capacitance Characteristics


Figure 10: Normalized Breakdown voltage vs. Junction Temperature

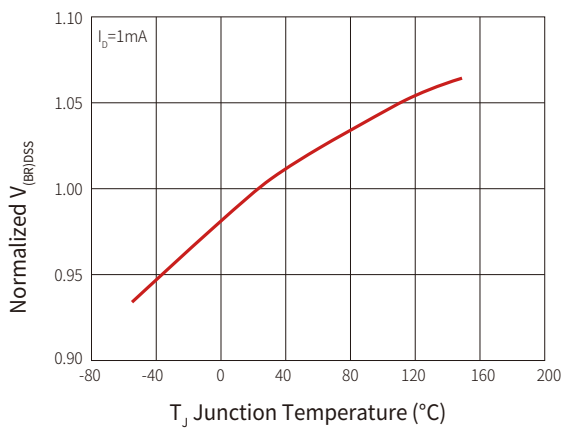


Figure 11: Normalized on Resistance vs. Junction Temperature

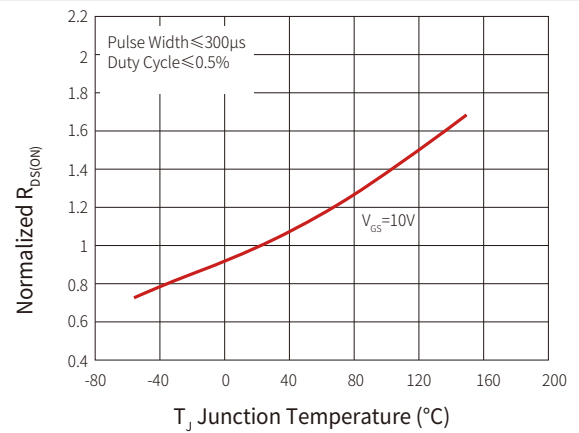


Figure 12: Normalized Threshold Voltage vs. Junction Temperature

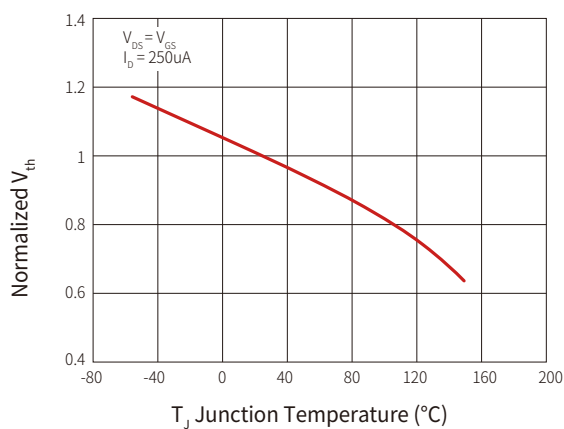


Figure 13: $R_{DS(ON)}$ vs. V_{GS}

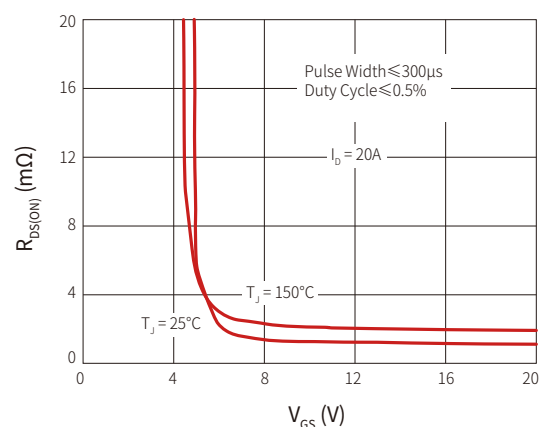
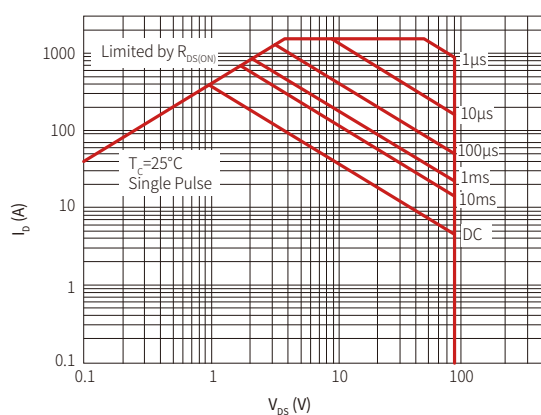
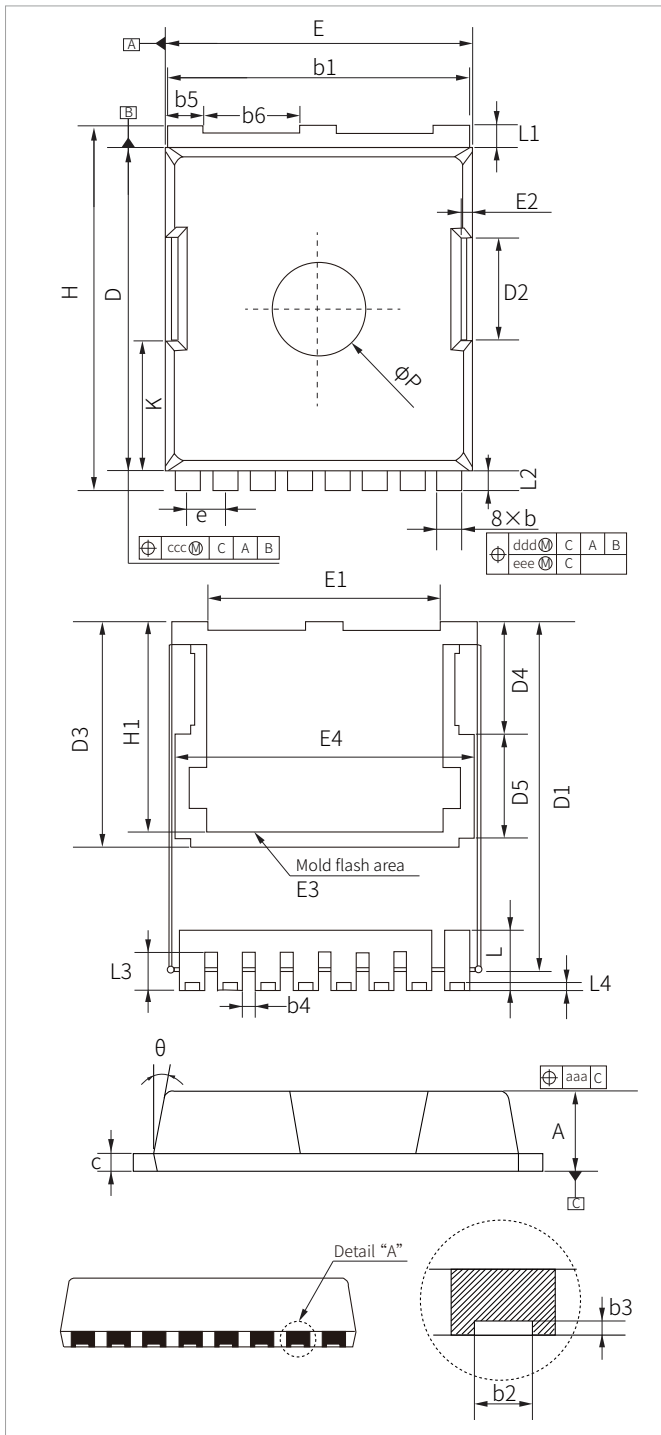


Figure 14: Maximum Safe Operating Area



TOLL-8L PACKAGE INFORMATION



Ref.	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.40	0.087	0.094
b	0.70	0.90	0.028	0.035
b1	9.70	9.90	0.382	0.390
b2	0.36	0.55	0.014	0.022
b3	0.05	-	0.002	-
b4	0.30	0.50	0.012	0.020
b5	1.10	1.30	0.043	0.051
b6	3.00	3.20	0.118	0.126
c	0.40	0.60	0.016	0.024
D	10.28	10.55	0.405	0.415
D1	10.98	11.18	0.432	0.440
D2	3.20	3.40	0.126	0.134
D3	7.15		0.281	
D4	3.59		0.141	
D5	3.26		0.128	
e	1.10	1.30	0.043	0.051
E	9.80	10.00	0.386	0.394
E1	7.40	7.60	0.291	0.299
E2	7.40	7.60	0.291	0.299
E3	8.50		0.335	
E4	9.46		0.372	
H	11.50	11.85	0.453	0.466
H1	6.55	6.75	0.258	0.266
K	4.08	4.28	0.161	0.169
L	1.60	2.10	0.063	0.083
L1	0.50	0.90	0.020	0.035
L2	0.50	0.70	0.020	0.028
L3	1.00	1.30	0.040	0.051
L4	0.13	0.33	0.005	0.013
P	2.85	3.15	0.112	0.124
θ	10°REF		0.398°REF	
aaa	0.20		0.008	
ccc	0.20		0.008	
ddd	0.25		0.010	
eee	0.20		0.008	

ORDERING INFORMATION

Part Number	Component Package	Marking	QTY/Reel	QTY/Box
SNM220N08T	TOLL-8L	 220N08 XXXX	2000PCS	10000PCS

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By QR Code

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