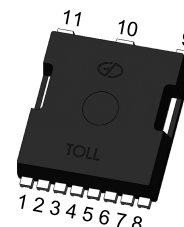


N-Channel 130V (D-S) Power MOSFET

Features

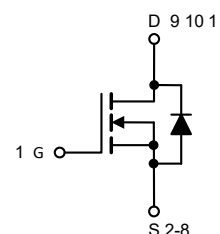
- 100% Avalanche Tested
- Extremely Low Losses with Low FOM $R_{DS(on)} \cdot Q_g$
- Halogen Free, Pb-Free
- RoHS Compliant



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Applications

- DC/DC
- Synchronous Rectification in SMPS
- Hard Switching and High Speed Circuit



Absolute Maximum Ratings ($T_J=25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain Source Voltage		V _{DS}	135	V
Gate Source Voltage		V _{GS}	±20	V
Drain Current, Continuous V _{GS} =10V	T _C =25°C	I _D	336	A
	T _C =100°C		237	
Drain Current, Pulsed (<i>Note 1</i>)		I _{DM}	1342	A
Single Avalanche Energy (<i>Note 2</i>)		E _{AS}	2016	mJ
Power Dissipation	T _C =25°C	P _D	517	W
	T _C =100°C		259	
Operating Junction/ Storage Temperature Range		T _J / T _{STG}	-55 to +175	°C

Note 1: Single Pulse; $t_p \leq 1\text{us}$.

Note 2: $V_{DD} = 65\text{V}$, $V_{GS} = 10\text{V}$, $L = 1\text{mH}$, starting $T_J = 25^\circ\text{C}$.

Thermal Characteristics

Parameter	Symbol	Max	Unit
Thermal Resistance Junction to Case	R_{thJC}	0.29	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient (Note 3)	R_{thJA}	25	$^\circ\text{C/W}$

Note 3: Device mounted on 1 square inch FR4 PCB board, with 2oz single-sided copper, in a 25°C still air environment.

Electrical Characteristics (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	135	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =135V, V _{GS} =0V	--	--	1	uA
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =250uA	2	3	4	V
Gate Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
Drain-Source On-state Resistance (Note 4)	R _{DS(on)}	V _{GS} =10V, I _D =80A	--	1.7	2.1	mΩ
Total Gate Charge	Q _g	V _{GS(off)} =0V, V _{GS(on)} =10V, V _{DD} =65V, I _D =80A	--	114	--	nC
Gate Source Charge	Q _{gs}		--	38	--	
Gate Drain Charge	Q _{gd}		--	23	--	
Turn-on Delay Time	t _{d(on)}	V _{GS} =10V, V _{DD} =65V, I _D =80A, R _G =3Ω	--	18	--	ns
Turn-on Rise Time	t _r		--	25	--	
Turn-off Delay Time	t _{d(off)}		--	59	--	
Turn-off Fall Time	t _f		--	30	--	
Gate Resistance	R _g	V _{GS} =0V, f=1MHz, open drain	--	1.2	--	Ω
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =65V, f=1MHz	--	8515	--	pF
Output Capacitance	C _{oss}		--	3474	--	
Reverse Transfer Capacitance	C _{rss}		--	50	--	

Reverse Diode Characteristics (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Forward Current, Continuous	I _{SD}	T _C =25°C	--	--	336	A
Diode Forward Voltage (Note 4)	V _{SD}	I _F =2A, V _{GS} =0V	--	--	1.2	V
Reverse Recovery Time	T _{rr}	I _F = 80A, di/dt = 100 A/μs	--	112	--	ns
Reverse Recovery Charge	Q _{rr}		--	283	--	nC

Note 4: Pulse test; pulse width ≤ 380μs, duty cycle ≤ 1%.

Typical Characteristics Curves ($T_J = 25^\circ\text{C}$ unless otherwise noted)

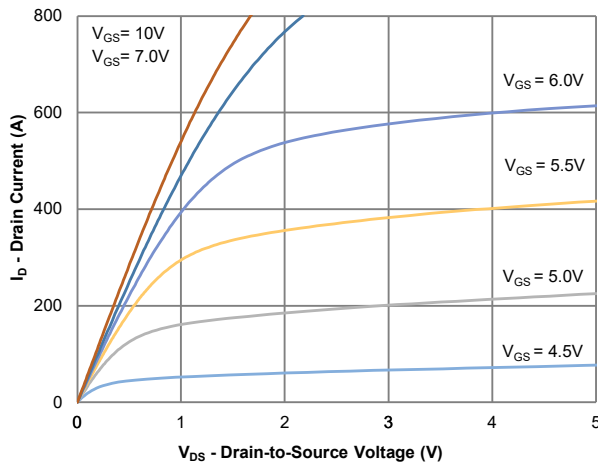


Figure 1: Output Characteristics

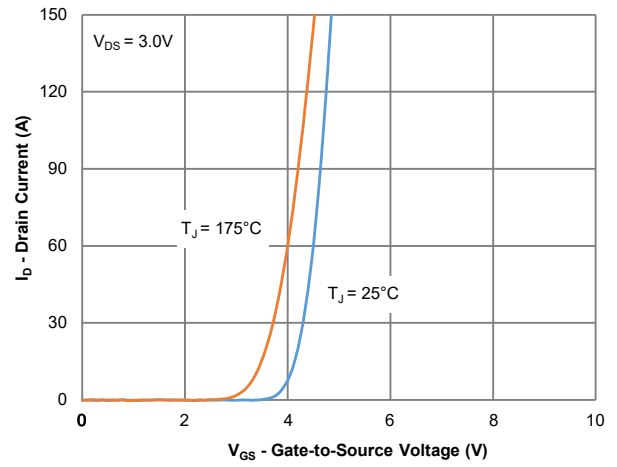


Figure 2: Transfer Characteristics

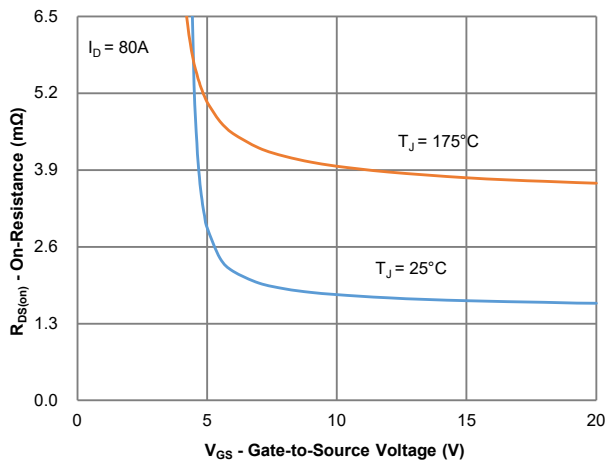


Figure 3: On-Resistance vs. Gate-Source Voltage

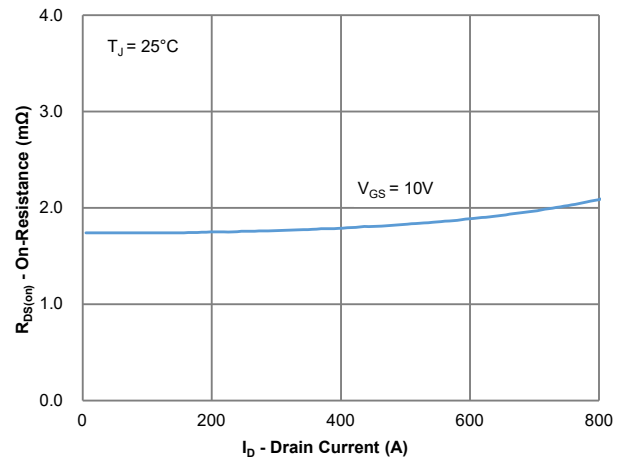


Figure 4: On-Resistance vs. Drain Current and Gate Voltage

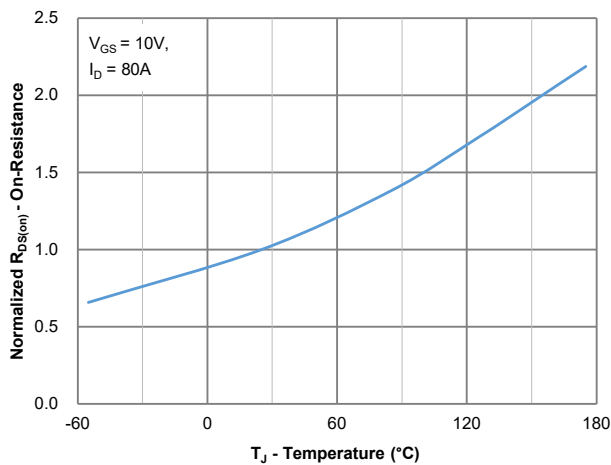


Figure 5: On-Resistance vs. Junction Temperature

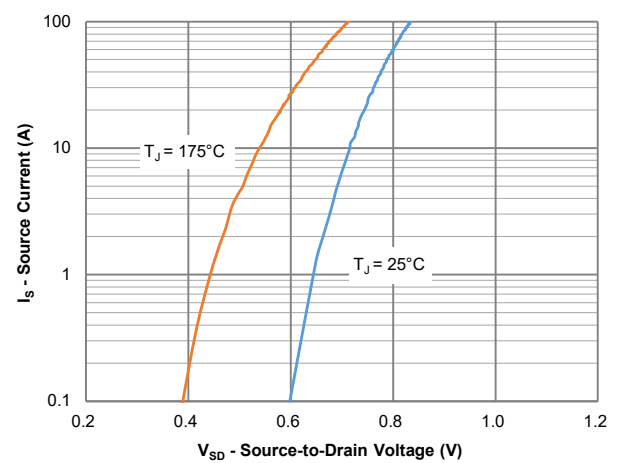


Figure 6: Source-Drain Diode Forward Voltage

Typical Characteristics Curves ($T_J = 25^\circ\text{C}$ unless otherwise noted)

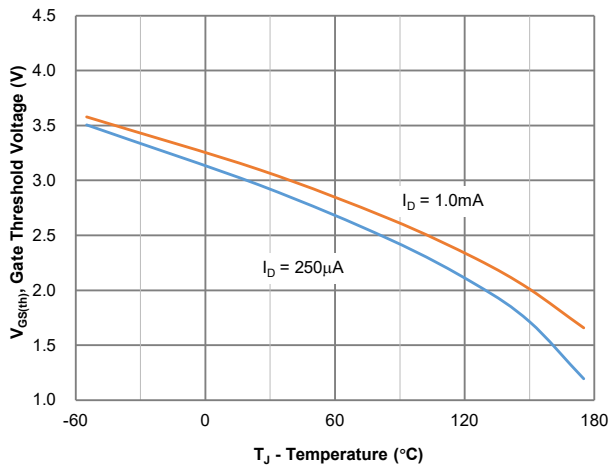


Figure 7: Gate Threshold Variation vs. Junction Temperature

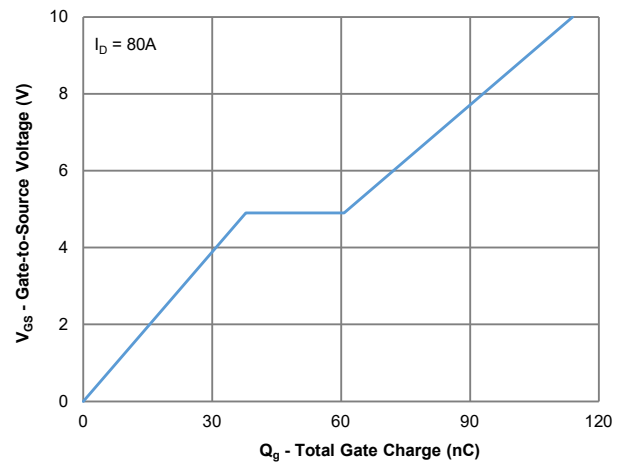


Figure 8: Gate Charge Characteristics

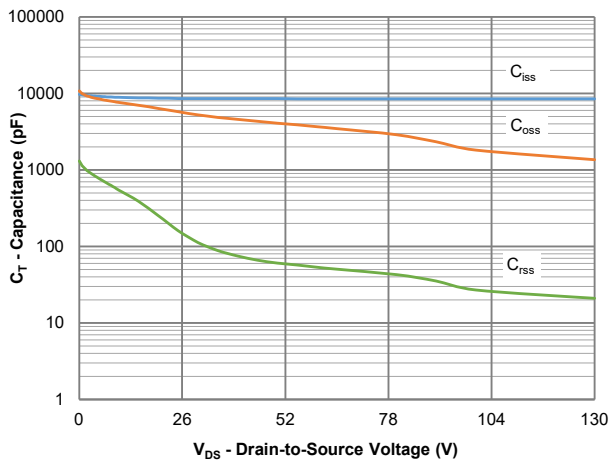


Figure 9: Capacitance Characteristics

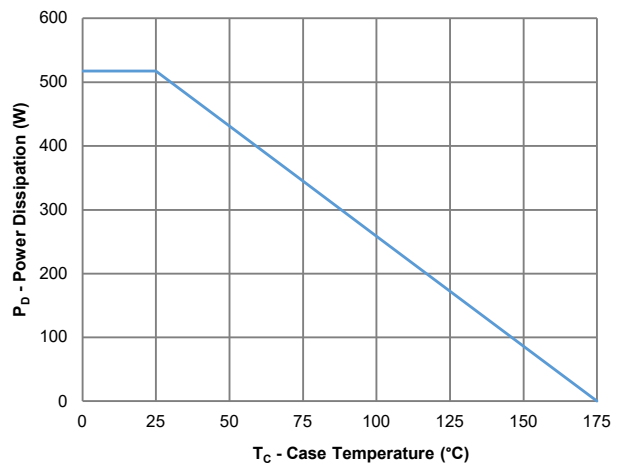


Figure 10: Power Derating

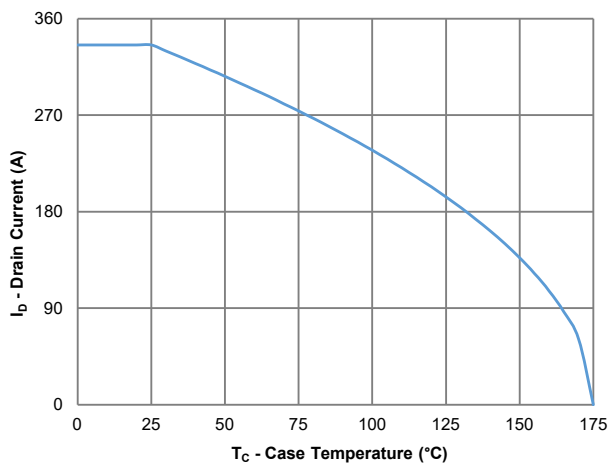


Figure 11: Current Derating

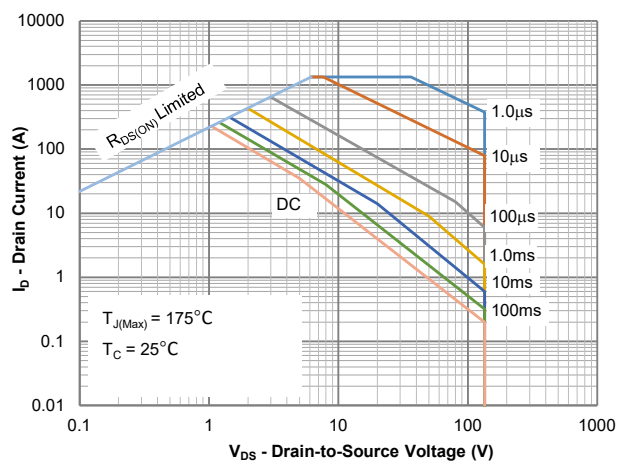


Figure 12: Safe Operating Area

Typical Characteristics Curves ($T_J = 25^\circ\text{C}$ unless otherwise noted)

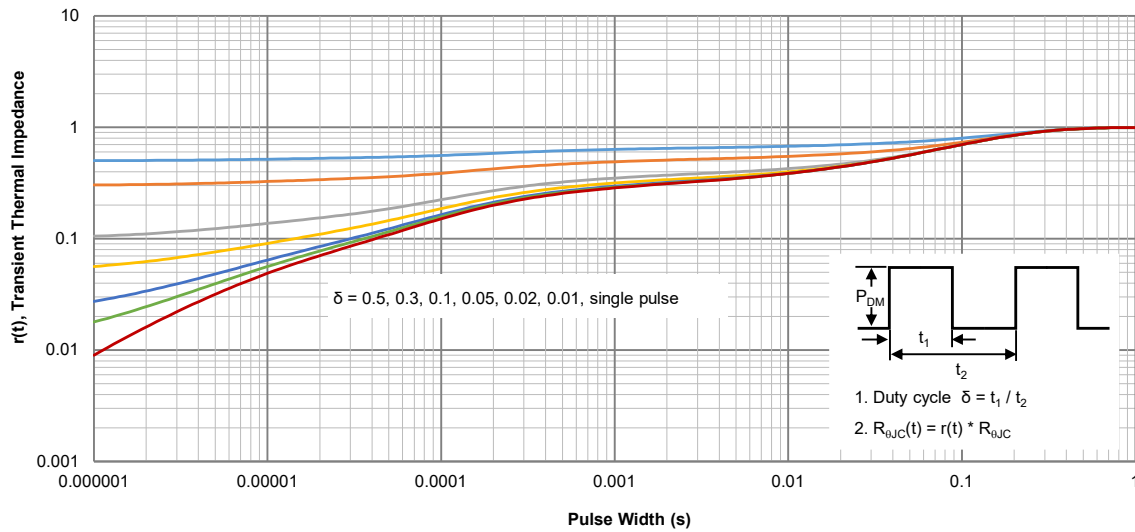
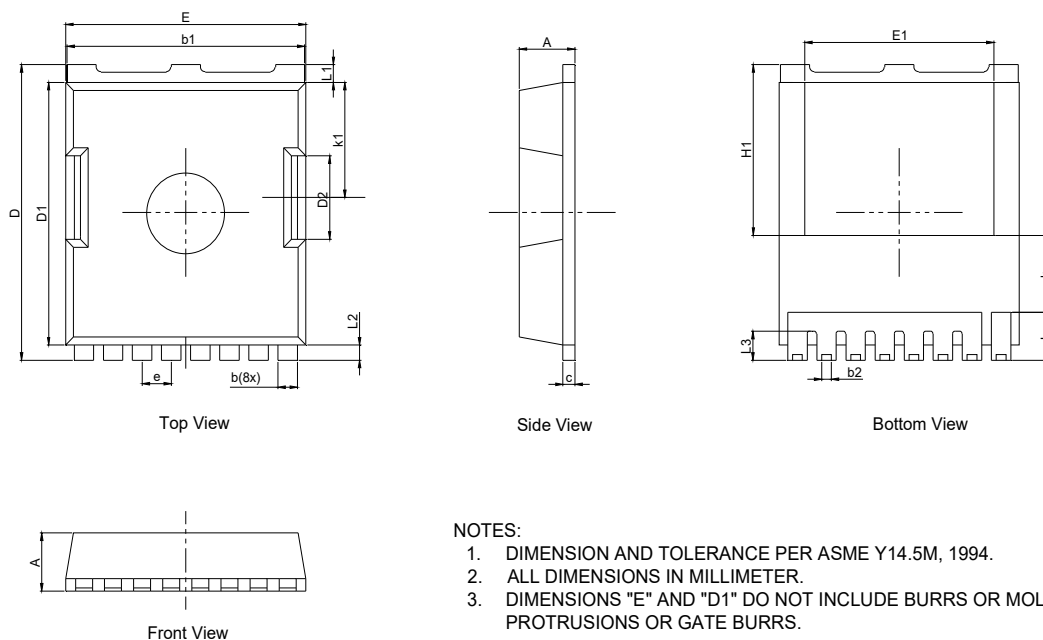


Figure 13: Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions (Unit: millimeters)

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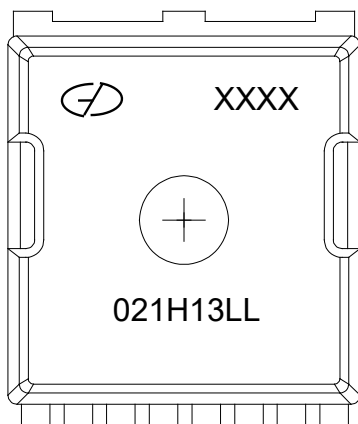


NOTES:

1. DIMENSION AND TOLERANCE PER ASME Y14.5M, 1994.
2. ALL DIMENSIONS IN MILLIMETER.
3. DIMENSIONS "E" AND "D1" DO NOT INCLUDE BURRS OR MOLD FLASH. PROTRUSIONS OR GATE BURRS.

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	2.200	2.300	2.400
b	0.650	0.800	0.900
b1	9.650	9.800	9.950
b2	0.400 REF		
c	0.400	0.500	0.600
D	11.480	11.680	11.950
D1	10.250	--	10.700
D2	2.850	--	3.400
E	9.700	9.900	10.100
E1	8.000	--	9.250
e	1.200 BSC		
H1	6.700	7.000	7.300
k	3.000 REF		
k1	4.550 REF		
L	1.350	--	2.100
L1	0.700 REF		
L2	0.600 REF		
L3	0.950	1.200	1.350

Marking Outline



Part Name: GMN021H13LL

1. Logo Mark: 
2. P/N Mark: 021H13LL
3. Date Code: XXXX

Revision History

Version	Date	Major Changes
Rev.A	2025.05.14	Official Release

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