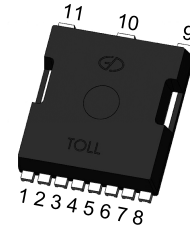


N-Channel 100V (D-S) Power MOSFET

Features

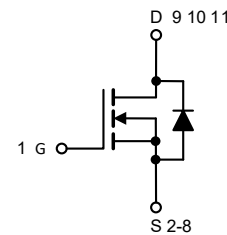
- 100% Avalanche Tested
- Extremely Low Losses with Low FOM $R_{DS(on)} \cdot Q_g$
- Halogen Free, Pb-Free
- RoHS Compliant



TOLL

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}	100	V
Gate Source Voltage	V_{GS}	± 20	V
Drain Current, Continuous $V_{GS}=10\text{V}$	I_D	$T_C=25^\circ\text{C}$ 385	A
		$T_C=100^\circ\text{C}$ 273	
Drain Current, Pulsed (Note 1)	I_{DM}	1316	A
Single Avalanche Energy (Note 2)	E_{AS}	2016	mJ
Power Dissipation	P_D	$T_C=25^\circ\text{C}$ 429	W
		$T_C=100^\circ\text{C}$ 214	
Operating Junction/ Storage Temperature Range	T_J / T_{STG}	-55 to +175	$^\circ\text{C}$

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

Note 2: $V_{DD} = 50\text{V}$, $V_{GS} = 10\text{V}$, $L = 1\text{mH}$, $R_G = 25\Omega$, starting $T_J = 25^\circ\text{C}$.

Thermal Characteristics

Parameter	Symbol	Max	Unit
Thermal Resistance Junction to Case	R_{thJC}	0.35	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient (Note 3)	R_{thJA}	29	$^\circ\text{C/W}$

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	100	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, 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 =20A	--	1.15	1.35	mΩ
Total Gate Charge	Q _g	V _{GS(off)} =0V, V _{GS(on)} =10V, V _{DD} =50V, I _D =20A	--	140	--	nC
Gate Source Charge	Q _{gs}		--	38	--	
Gate Drain Charge	Q _{gd}		--	27	--	
Turn-on Delay Time	t _{d(on)}	V _{GS} =10V, V _{DD} =50V, I _D =20A, R _G =3Ω	--	25	--	ns
Turn-on Rise Time	t _r		--	42	--	
Turn-off Delay Time	t _{d(off)}		--	87	--	
Turn-off Fall Time	t _f		--	63	--	
Gate Resistance	R _g	V _{GS} =0V, f=1MHz, open drain	--	2.1	--	Ω
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =50V, f=1MHz	--	9660	--	pF
Output Capacitance	C _{oss}		--	3476	--	
Reverse Transfer Capacitance	C _{rss}		--	48	--	

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	--	--	385	A
Diode Forward Voltage (Note 4)	V _{SD}	I _F =2A, V _{GS} =0V	--	0.7	1.2	V
Reverse Recovery Time	T _{rr}	I _F =20A, di/dt = 100 A/μs	--	105	--	ns
Reverse Recovery Charge	Q _{rr}		--	394	--	nC

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

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

Fig1 - Output Characteristics

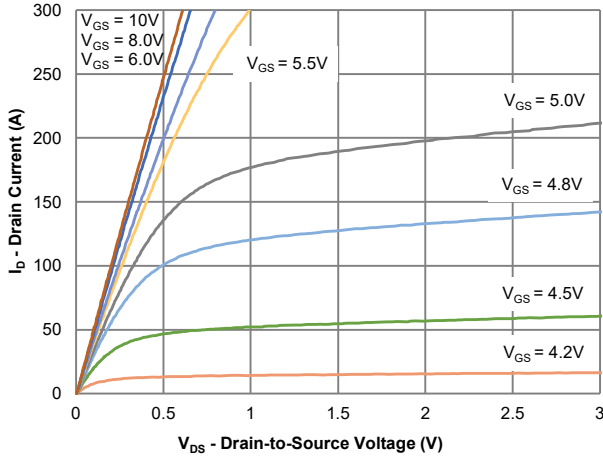


Fig2 - Transfer Characteristics

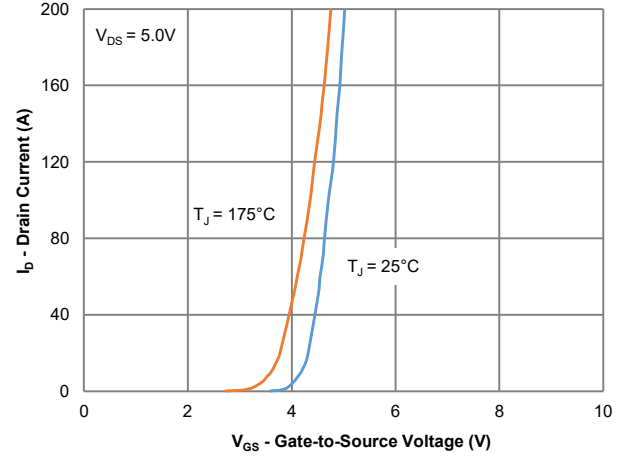


Fig3 - On-Resistance vs. Gate-Source Voltage

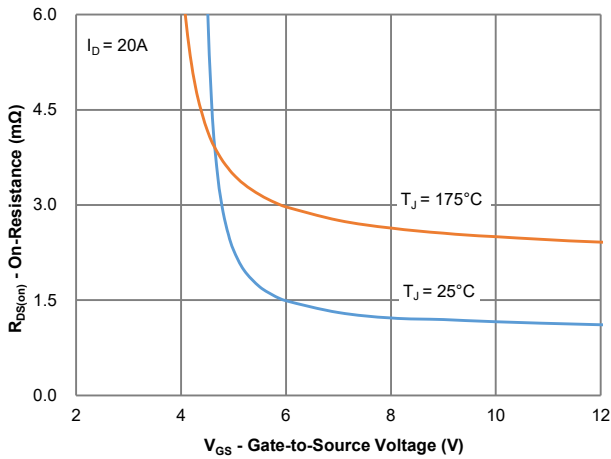


Fig4 - On-Resistance vs. Drain Current and Gate Voltage

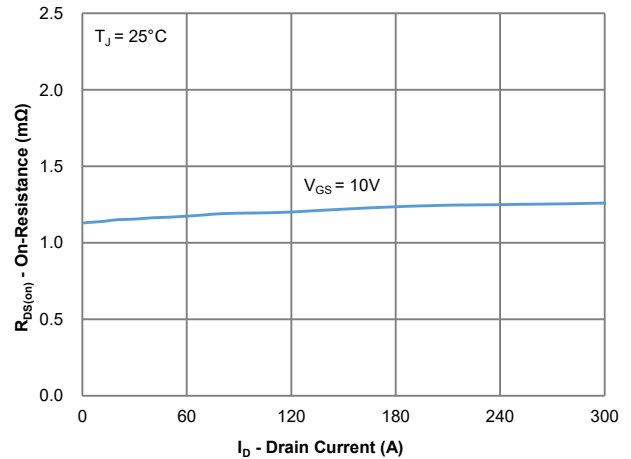


Fig5 - On-Resistance vs. Junction Temperature

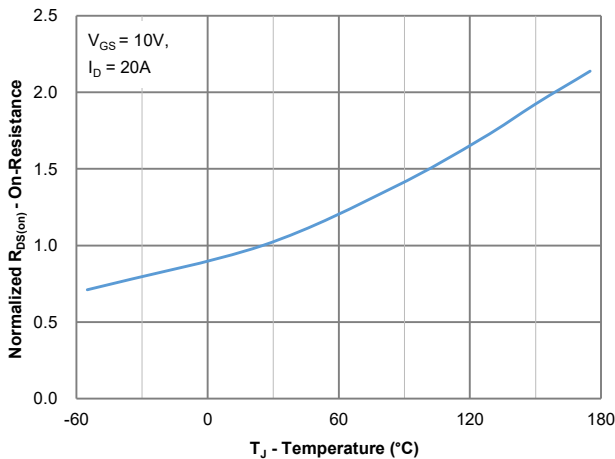
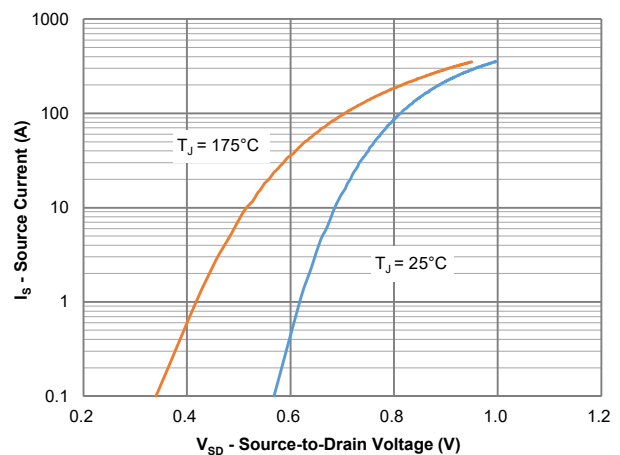


Fig6 - Source-Drain Diode Forward Voltage



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

Fig7 - Gate Threshold Variation vs. Junction Temperature

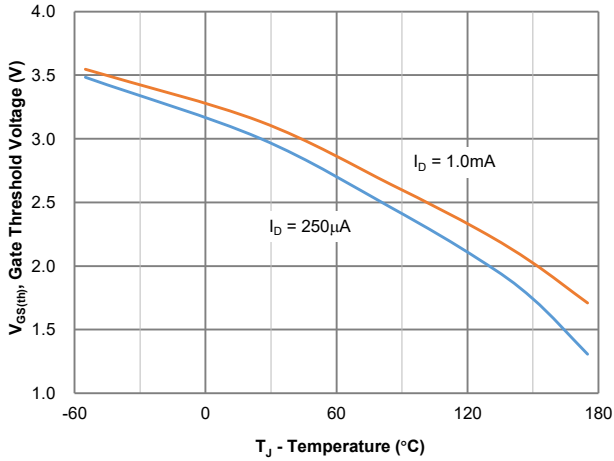


Fig8 - Gate Charge Characteristics

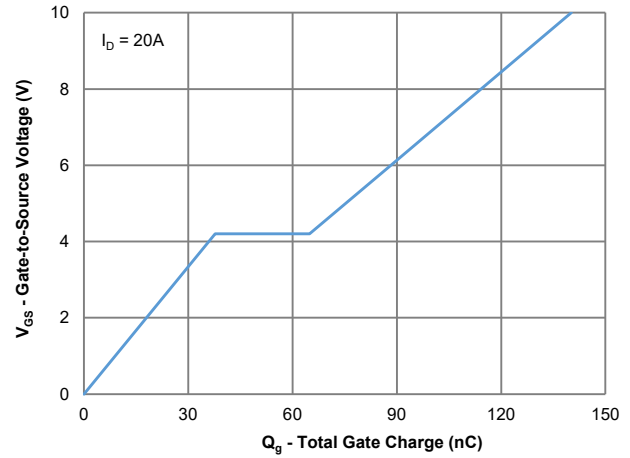


Fig9 - Capacitance Characteristics

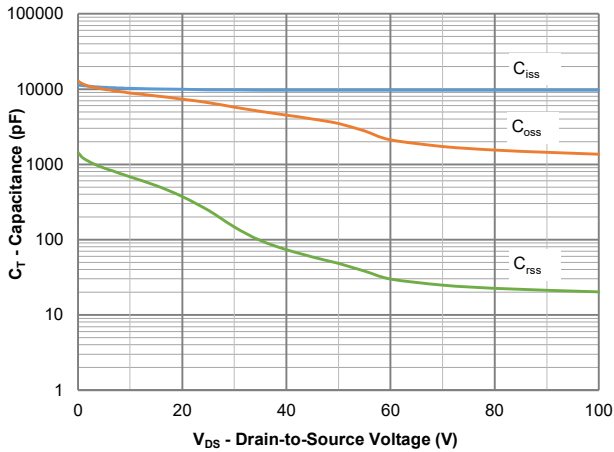


Fig10 - Power Derating

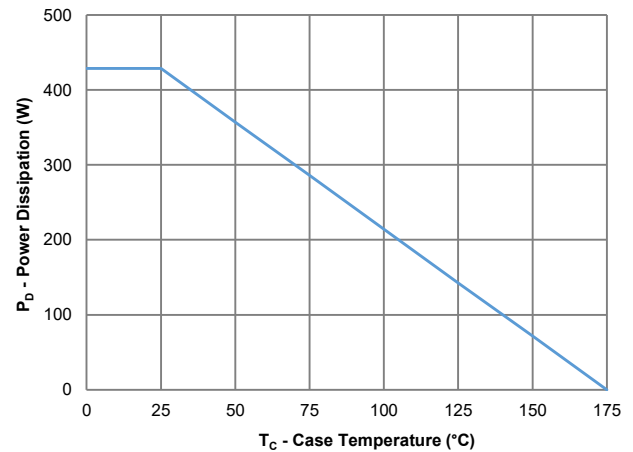


Fig11 - Current Derating

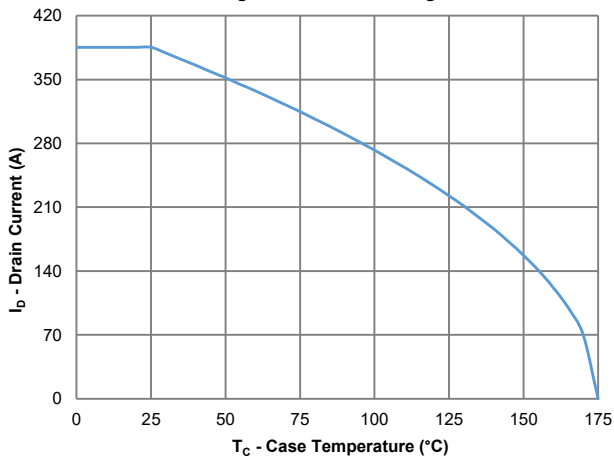
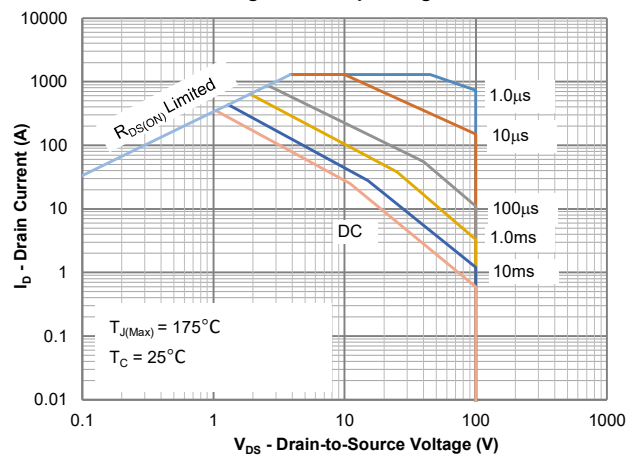
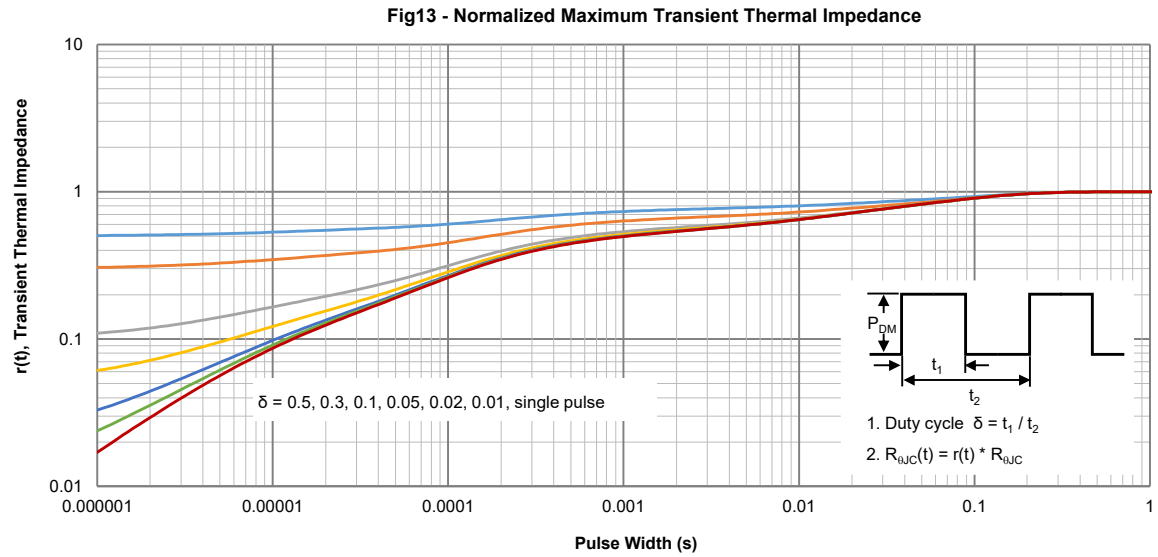


Fig12 - Safe Operating Area

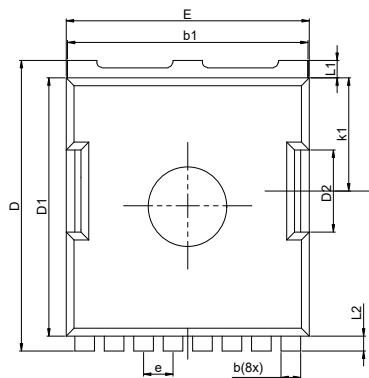


Typical Characteristics Curves (T_J = 25°C unless otherwise noted)

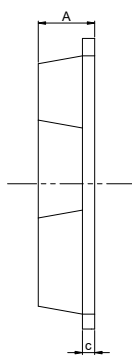


Package Outline Dimensions (Unit: millimeters)

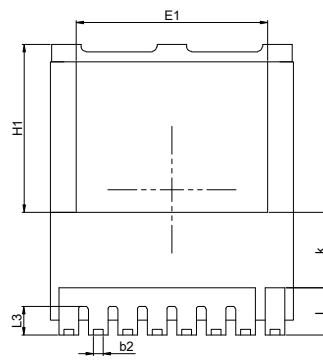
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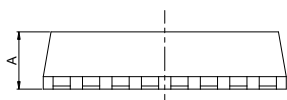
Top View



Side View



Bottom View



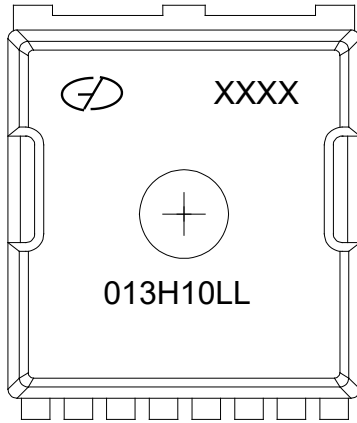
Front View

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: GMN013H10LL

1. Logo Mark: 
2. P/N Mark: 013H10LL
3. Date Code: XXXX

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