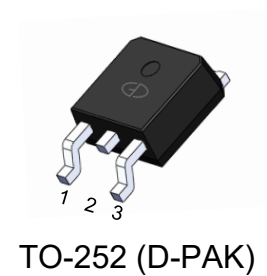


N-Channel 30V (D-S) Power MOSFET

Features

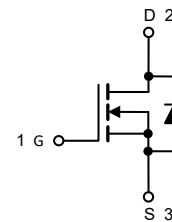
- 100% Avalanche Tested
- Extremely Low Losses with Low FOM $R_{ds(on)} \cdot Q_g$
- Halogen Free, Pb-Free
- RoHS Compliant



TO-252 (D-PAK)

Applications

- DC/DC
- Motors, lamps
- Power switching



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

Parameter	Symbol	Value	Unit
Drain Source Voltage	V_{DS}	30	V
Gate Source Voltage	V_{GS}	± 20	V
Drain Current, Continuous $V_{GS}=10\text{V}$	I_D	$T_C=25^\circ\text{C}$	125
		$T_C=100^\circ\text{C}$	79
Drain Current, Pulsed (Note 1)	I_{DM}	500	A
Single Avalanche Energy (Note 2)	E_{AS}	576	mJ
Power Dissipation	P_D	$T_C=25^\circ\text{C}$	89
		$T_C=100^\circ\text{C}$	36
Operating Junction/ Storage Temperature Range	T_J/ T_{STG}	-55 to +150	$^\circ\text{C}$

Note 1: Single pulse; $t_p \leq 1\mu\text{s}$.

Note 2: $V_{DD} = 20\text{V}$, $V_{GS} = 10\text{V}$, $L = 0.5\text{mH}$, $R_G = 25\Omega$, starting $T_J = 25^\circ\text{C}$.

Thermal Characteristics

Parameter	Symbol	Max	Unit
Thermal Resistance Junction to Case	R_{thJC}	1.4	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient (Note 3)	R_{thJA}	62.5	$^\circ\text{C/W}$

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 ($T_J = 25^\circ\text{C}$ unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	30	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	--	--	1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_{DS}=250\mu A$	1	--	2.5	V
Gate Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	--	--	± 100	nA
Drain-Source On-state Resistance (Note 4)	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$	--	2.3	3	m Ω
		$V_{GS}=4.5V, I_D=20A$	--	3.3	4.4	
Total Gate Charge	Q_g	$V_{GS(off)}=0V, V_{GS(on)}=10V, V_{DD}=15V, I_D=20A$	--	115	--	nC
Gate-Source Charge	Q_{gs}		--	15.4	--	
Gate-Drain Charge	Q_{gd}		--	27.2	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DD}=15V, R_L=0.75\Omega, R_G=3\Omega$	--	21	--	ns
Turn-on Rise Time	t_r		--	18	--	
Turn-off Delay Time	$t_{d(off)}$		--	64	--	
Turn-off Fall Time	t_f		--	16.5	--	
Gate Resistance	R_g	$V_{GS}=0V, f=1MHz, \text{open drain}$	--	0.6	--	Ω
Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=15V, f=1MHz$	--	6536	--	pF
Output Capacitance	C_{oss}		--	761	--	
Reverse Transfer Capacitance	C_{rss}		--	461	--	

Reverse Diode Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Forward Current, Continuous	I_{SD}	$T_C=25^\circ\text{C}$	--	--	139	A
Diode Forward Voltage (Note 4)	V_{SD}	$I_F=20A, V_{GS}=0V$	--	--	1.2	V
Reverse Recovery Time	T_{rr}	$I_F=20A, di/dt=100A/\mu s$	--	33	--	ns
Reverse Recovery Charge	Q_{rr}		--	29	--	nC

Note 4: Pulse test; pulse width $\leq 380\mu s$, duty cycle $\leq 1\%$.

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

Fig.1 - Output Characteristics

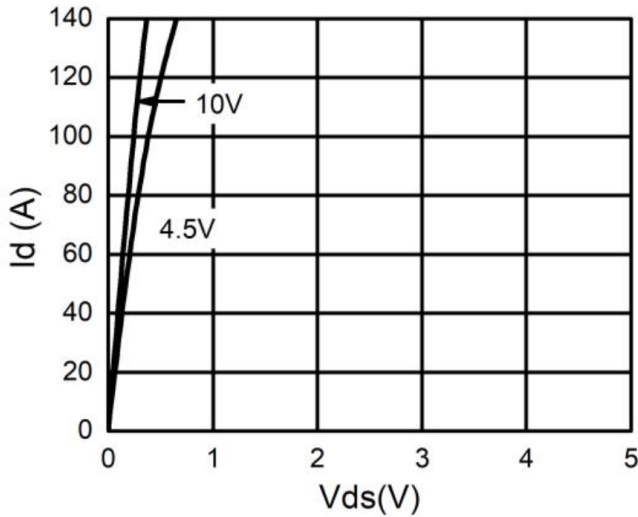


Fig.2 - Transfer Characteristics

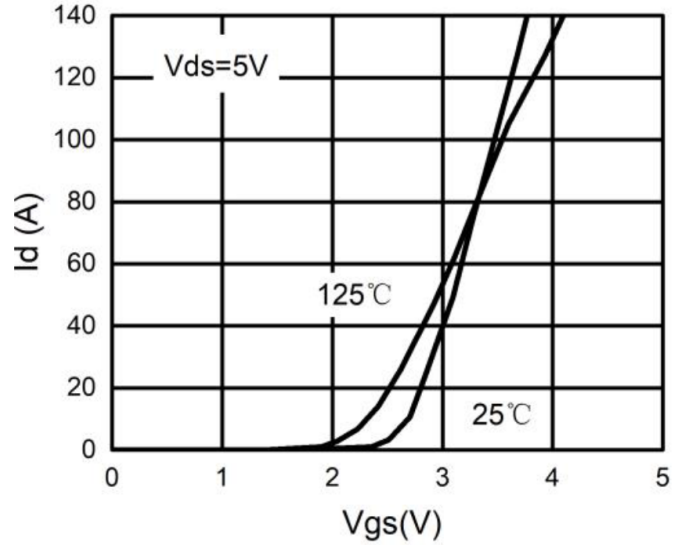


Fig.3 - Normalized On-Resistance

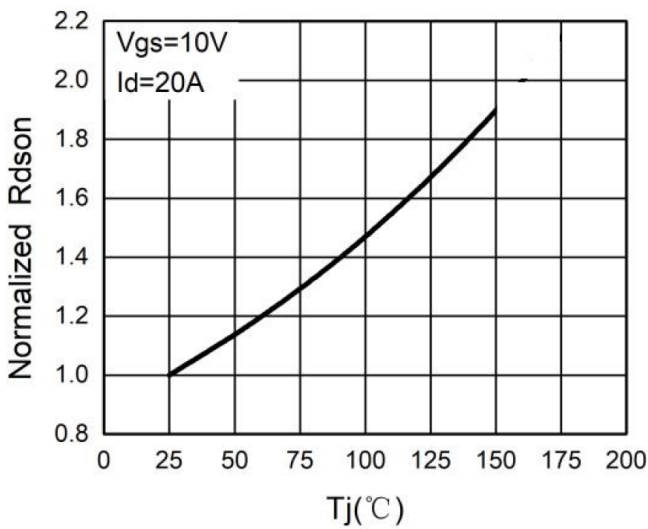


Fig.4 - Capacitance

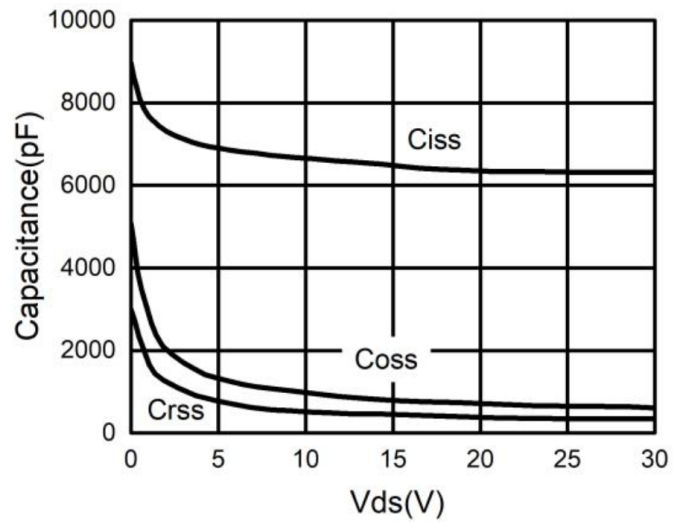


Fig.5 - Gate charge

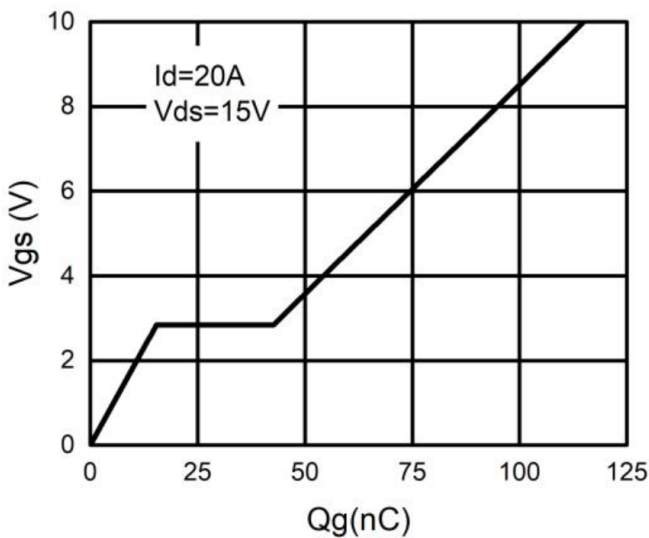
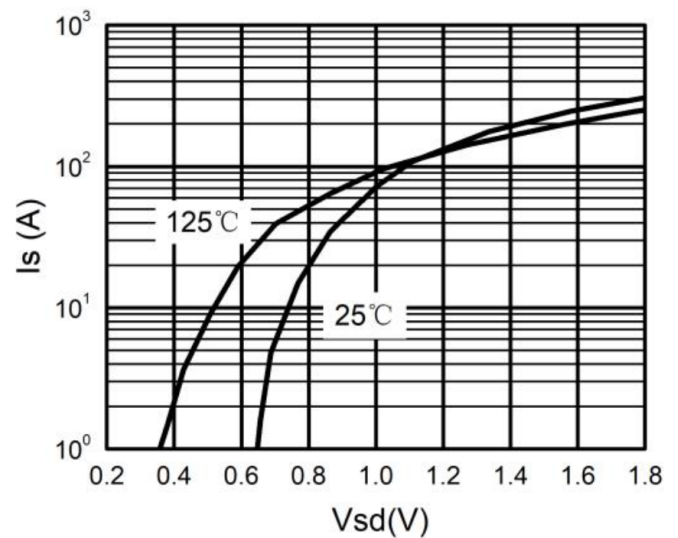


Fig.6 - Forward Characteristic



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

Fig.7 - Safe Operating Area

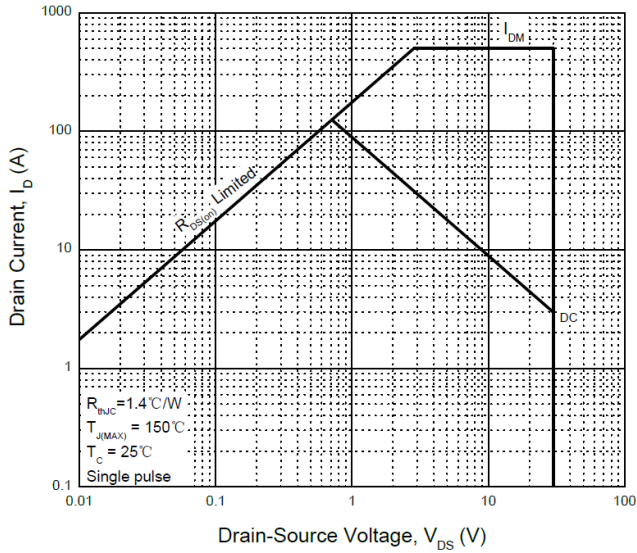


Fig.8 - Power Derating

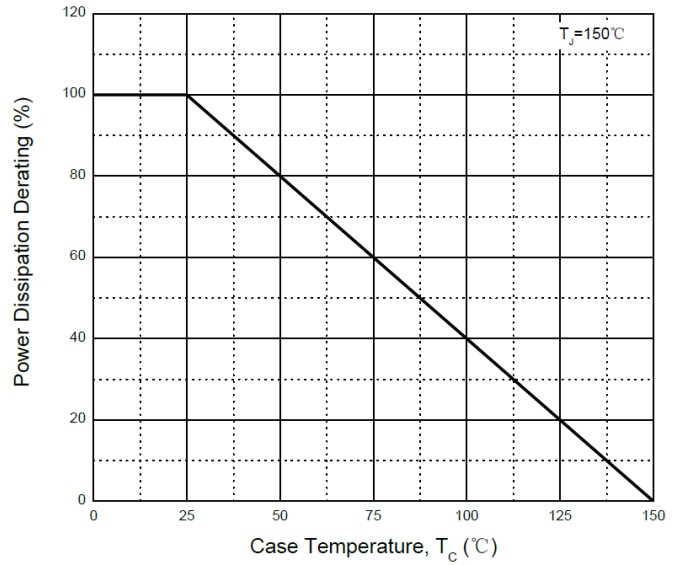
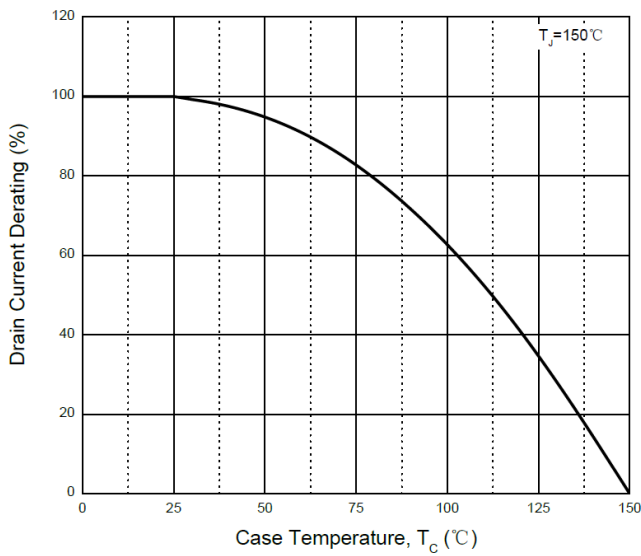
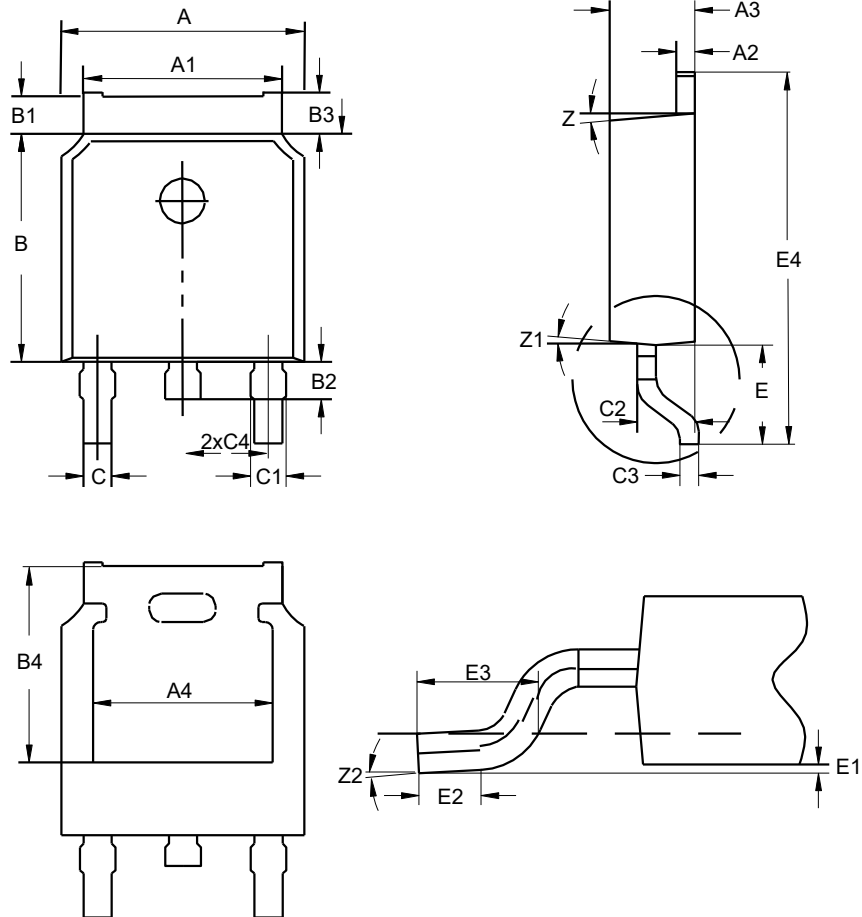


Fig.9 - Drain Current Derating



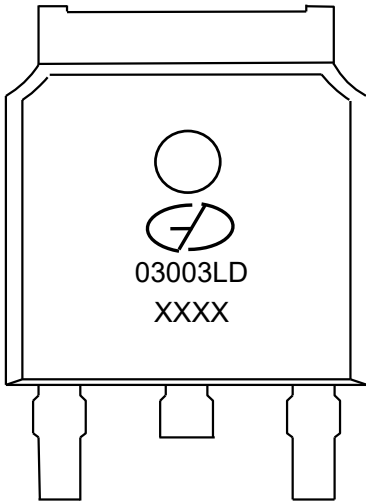
Package Outline Dimensions (Unit: millimeters)

TO-252(D-PAK)




TO-252							
	Min.	Nom.	Max.		Min.	Nom.	Max.
A	6.34	6.54	6.74	C2	1.34	1.54	1.74
A1	5.2	5.3	5.4	C3	0.4	0.5	0.6
A2	0.4	0.5	0.6	C4	2.09	2.29	2.49
A3	2.08	2.28	2.48	E	2.6	2.9	3.2
A4	4.6	4.8	5.0	E1	0	-	0.15
B	5.8	6.1	6.4	E2	0.7	-	-
B1	0.82	1.02	1.22	E3	1.3	1.6	1.9
B2	0.8	1	1.2	E4	9.8	10.1	10.4
B3	0.9	1.1	1.3	Z	-	7°	-
B4	5.05	5.25	5.45	Z1	-	7°	-
C	0.66	0.76	0.86	Z2	0°	-	10°
C1	0.65	0.85	1.05	-	-	-	-

Marking Outline



Part Name: GMN03003LD

1. Logo Mark: 
2. P/N Mark: 03003LD
3. Date Code: XXXX

Revision History

Version	Date	Major Changes
Rev.A	2024.02.28	Official Release

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