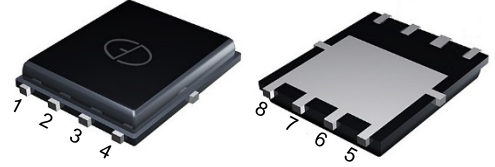


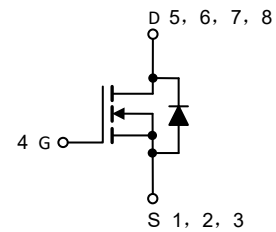
N-Channel 40V (D-S) Power MOSFET

Features

- 100% Avalanche Tested
- Extremely Low Losses with Low FOM $R_{ds(on)} \cdot Q_g$
- RoHS Compliant, Halogen Free, Pb-Free
- MSL 1



PDFN5060



Applications

- Industrial systems
- Motors, lamps and solenoid control
- Ultra high performance power switching

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

Parameter	Symbol	Value	Unit
Drain Source Voltage	V_{DS}	40	V
Gate Source Voltage	V_{GS}	± 20	V
Drain Current, Continuous $V_{GS}=10\text{V}$	I_D	$T_C=25^\circ\text{C}$	215
		$T_C=100^\circ\text{C}$	136
Drain Current, Pulsed (Note 1)	I_{DM}	860	A
Single Avalanche Energy (Note 2)	E_{AS}	812	mJ
Power Dissipation	P_D	$T_C=25^\circ\text{C}$	111
		$T_C=100^\circ\text{C}$	44
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: $V_{DD} = 40\text{V}$, $V_{GS} = 10\text{V}$, $L = 0.5\text{mH}$, $R_G = 25\Omega$, starting $T_J = 25^\circ\text{C}$.

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance Junction to Case	R_{thJC}	1.12	$^\circ\text{C/W}$

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	40	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V	--	--	1.0	uA
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =250uA	1.0	1.2	2.5	V
Gate Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	--	--	±100	nA
Drain-Source On-state Resistance (Note 3)	R _{DS(on)}	V _{GS} =10V, I _D =20A	--	1	1.5	mΩ
		V _{GS} =4.5V, I _D =20A	--	1.2	2	
Total Gate Charge	Q _g	V _{GS(off)} =0V, V _{GS(on)} =10V, V _{DD} =20V, I _D =20A	--	101	--	nC
Gate-Source Charge	Q _{gs}		--	16	--	
Gate-Drain Charge	Q _{gd}		--	17	--	
Turn-on Delay Time	t _{d(on)}	V _{GS} =10V, V _{DD} =20V, R _L =1Ω, R _G =3Ω	--	20	--	ns
Turn-on Rise Time	t _r		--	28	--	
Turn-off Delay Time	t _{d(off)}		--	85	--	
Turn-off Fall Time	t _f		--	31	--	
Gate Resistance	R _g	V _{GS} =0V, f=1MHz, open drain	--	1.8	--	Ω
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =20V, f=1MHz	--	6112	--	pF
Output Capacitance	C _{oss}		--	2137	--	
Reverse Transfer Capacitance	C _{rss}		--	130	--	

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	--	--	215	A
Diode Forward Voltage (Note 3)	V _{SD}	I _F =20A, V _{GS} =0V	--	--	1.2	V
Reverse Recovery Time	T _{rr}	I _F = 20A, di/dt = 100 A/μs	--	65	--	ns
Reverse Recovery Charge	Q _{rr}		--	75	--	nC

Note 3: Pulse test; pulse width ≤ 380μs, duty cycle ≤ 1%.

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

Fig. 1 - Output Characteristics

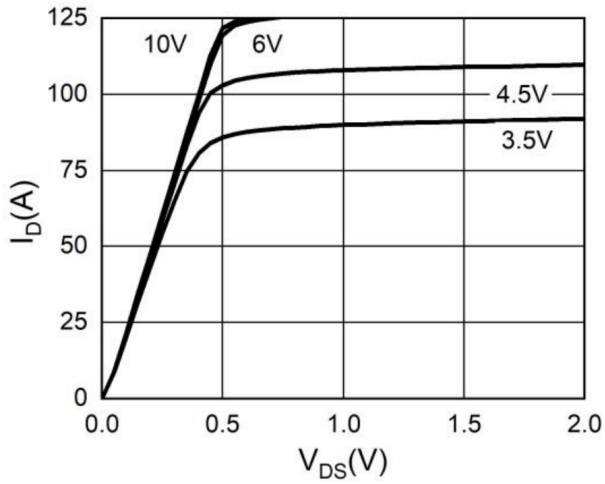


Fig. 2 - Transfer Characteristics

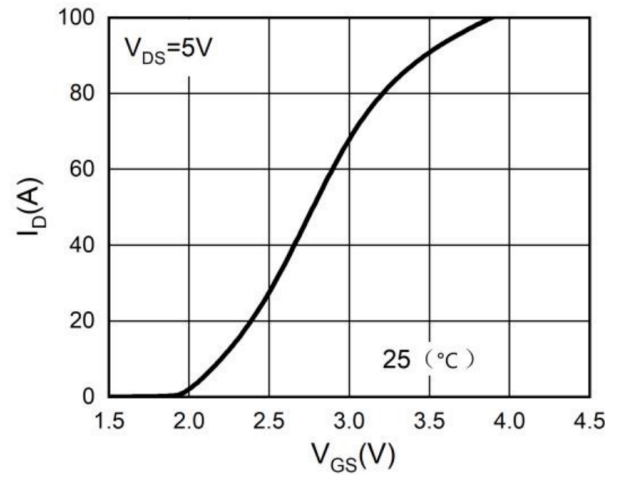


Fig. 3 - Drain-Source On-Resistance

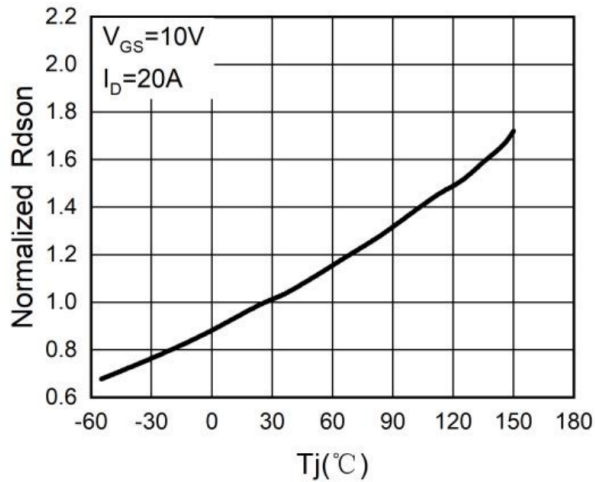


Fig. 4 - Drain-Source Breakdown Voltage

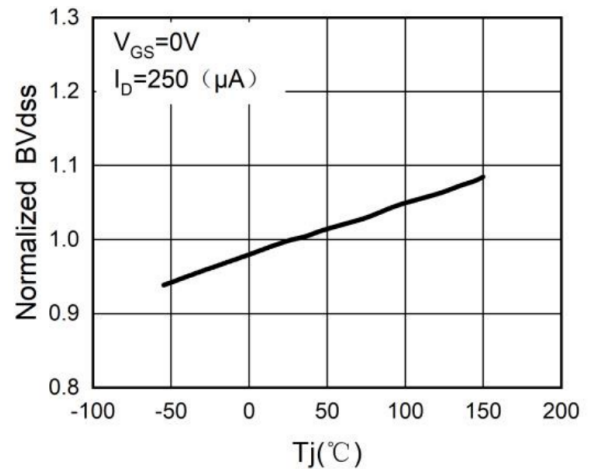


Fig. 5 - Capacitance

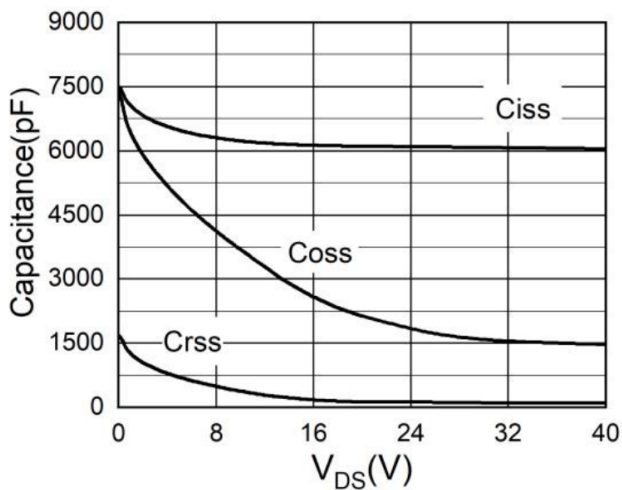
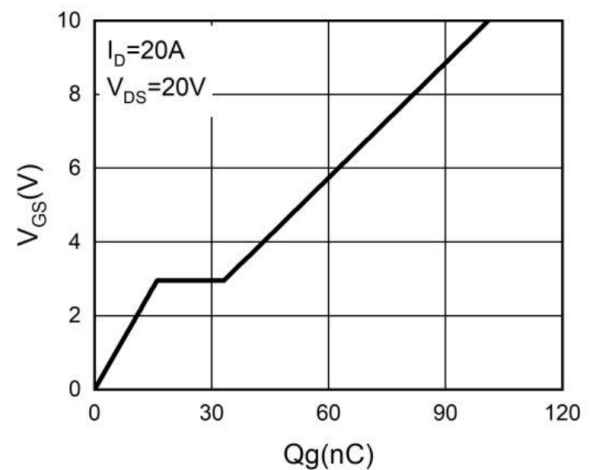


Fig. 6 - Gate Charge



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

Fig. 7 - Forward Characteristic

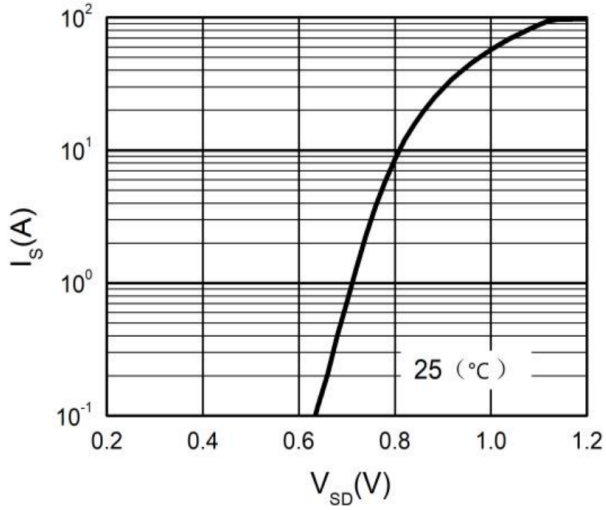


Fig. 8 - Safe Operating Area

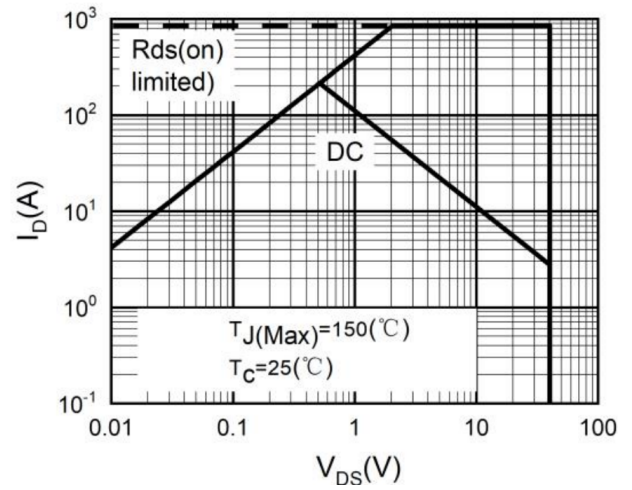


Fig. 9 - Power Derating

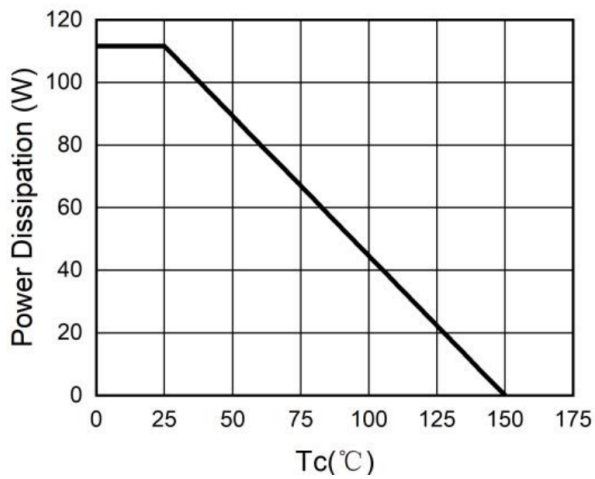
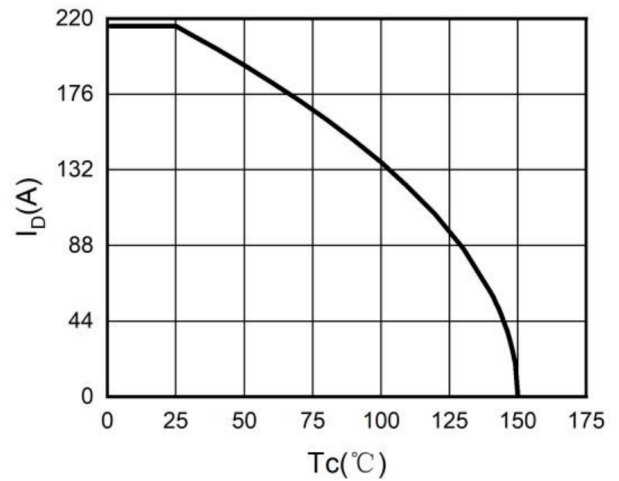
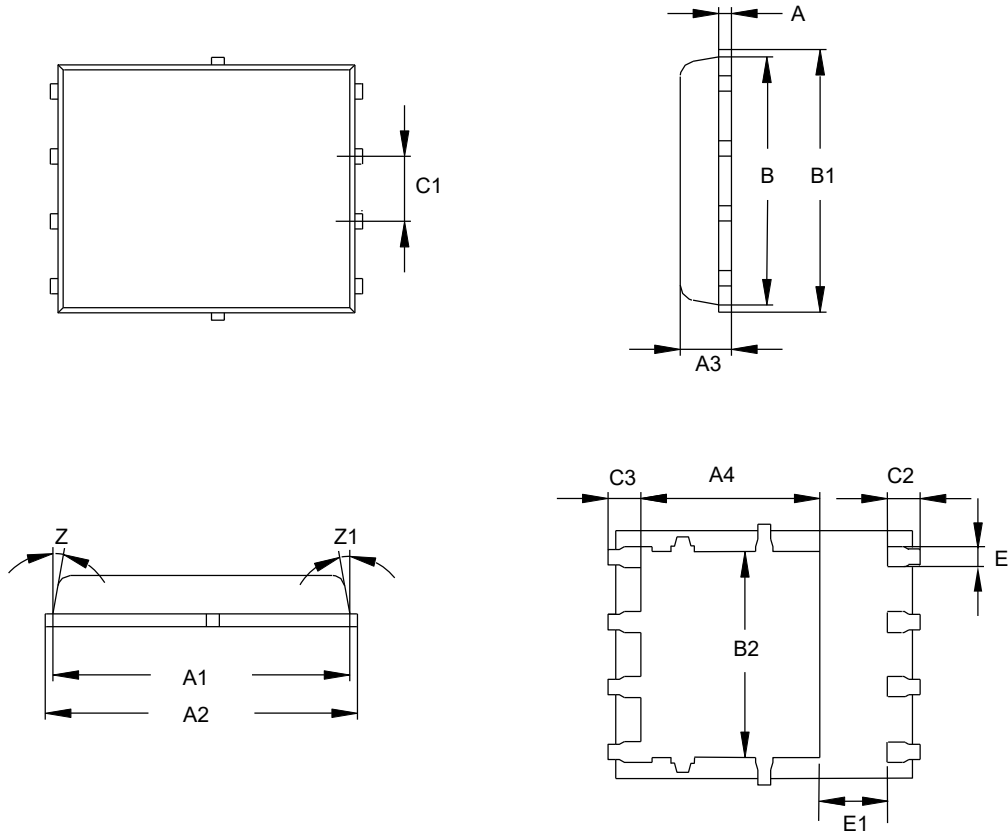


Fig. 10 - Drain Current Derating



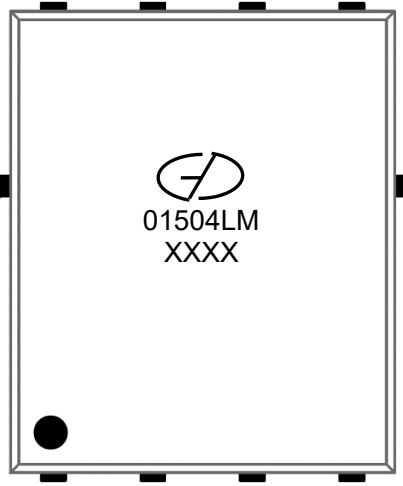
Package Outline Dimensions (Unit: millimeters)

PDFN5060



PDFN5060							
	Min.	Nom.	Max.		Min.	Nom.	Max.
A	0.15	0.25	0.35	C	0.05	0.15	0.25
A1	5.65	5.75	5.85	C1	1.17	1.27	1.37
A2	5.9	6.0	6.1	C2	0.51	0.61	0.71
A3	0.9	1	1.1	C3	0.525	0.625	0.725
A4	3.375	3.475	3.575	E	0.35	0.4	0.45
B	4.8	4.9	5.0	E1	1.19	1.29	1.39
B1	5.0	5.0	5.4	Z	8°	10°	12°
B2	3.91	4.01	4.11	Z1	8°	10°	12°

Marking Outline



Part Name: GMN01504LM

1. Logo Mark: 
2. P/N Mark: 01504LM
3. Date Code: XXXX
4. Pin 1#: ●

Revision History

Version	Date	Major Changes
Rev.A	2024.10.22	Official Release

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