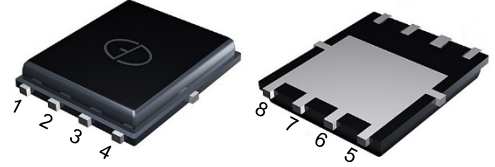


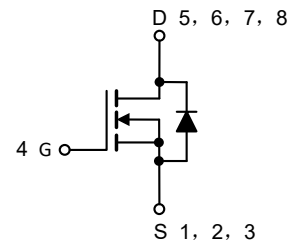
## N-Channel 80V (D-S) Power MOSFET

### Features

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



PDFN5060



### Applications

- DC-DC
- Motors, lamps
- Power switching

<b>Absolute Maximum Ratings</b> ( $T_J=25^\circ\text{C}$ unless otherwise noted)			
Parameter	Symbol	Value	Unit
Drain Source Voltage	$V_{DS}$	80	V
Gate Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current, Continuous $V_{GS}=10\text{V}$	$I_D$	$T_C=25^\circ\text{C}$	60
		$T_C=100^\circ\text{C}$	26
Drain Current, Pulsed ( <i>Note 1</i> )	$I_{DM}$	400	A
Single Avalanche Energy ( <i>Note 2</i> )	$E_{AS}$	600	mJ
Power Dissipation	$P_D$	$T_C=25^\circ\text{C}$	114
		$T_C=100^\circ\text{C}$	22
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:  $V_{DD} = 50\text{V}$ ,  $V_{GS} = 10\text{V}$ ,  $L = 1\text{mH}$ ,  $R_G = 25\Omega$ , starting  $T_J = 25^\circ\text{C}$ .*

<b>Thermal Characteristics</b>			
Parameter	Symbol	Max	Unit
Thermal Resistance Junction to Case	$R_{thJC}$	1.1	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient ( <i>Note 3</i> )	$R_{thJA}$	55	$^\circ\text{C/W}$

*Note 3: Device mounted on 1 square inch FR4 PCB board, with 2oz single-sided copper, in a  $25^\circ\text{C}$  still air environment.*

Electrical Characteristics (T <sub>J</sub> =25°C unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	80	--	--	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =80V, V <sub>GS</sub> =0V	--	--	1.0	uA
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250uA	2	--	4	V
Gate Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
Drain-Source On-state Resistance (Note 4)	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =20A	--	3.3	3.8	mΩ
Total Gate Charge	Q <sub>g</sub>	V <sub>GS(off)</sub> =0V, V <sub>GS(on)</sub> =10V, V <sub>DD</sub> =30V, I <sub>D</sub> =14.5A	--	61	--	nC
Gate-Source Charge	Q <sub>gs</sub>		--	12.5	--	
Gate-Drain Charge	Q <sub>gd</sub>		--	12	--	
Turn-on Delay Time	t <sub>d(on)</sub>	V <sub>GS</sub> =10V, V <sub>DD</sub> =30V, I <sub>D</sub> =14.5A, R <sub>G</sub> =3Ω	--	25	--	ns
Turn-on Rise Time	t <sub>r</sub>		--	55	--	
Turn-off Delay Time	t <sub>d(off)</sub>		--	75	--	
Turn-off Fall Time	t <sub>f</sub>		--	52	--	
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, f=1MHz, open drain	--	2	--	Ω
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =30V, f=1MHz	--	4000	--	pF
Output Capacitance	C <sub>oss</sub>		--	499	--	
Reverse Transfer Capacitance	C <sub>rss</sub>		--	26	--	

Reverse Diode Characteristics (T <sub>J</sub> =25°C unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Forward Current, Continuous	I <sub>SD</sub>	T <sub>C</sub> =25°C	--	--	60	A
Diode Forward Voltage (Note 4)	V <sub>SD</sub>	I <sub>F</sub> =20A, V <sub>GS</sub> =0V	--	0.82	--	V
Reverse Recovery Time	T <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>F</sub> =20A, di/dt = 400 A/μs	--	45	--	ns
Reverse Recovery Charge	Q <sub>rr</sub>		--	155	--	nC

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

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

Fig.1 - Output Characteristics

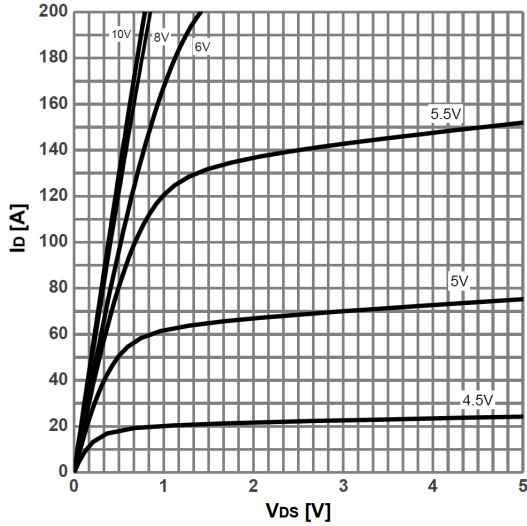


Fig.2 - Transfer Characteristics

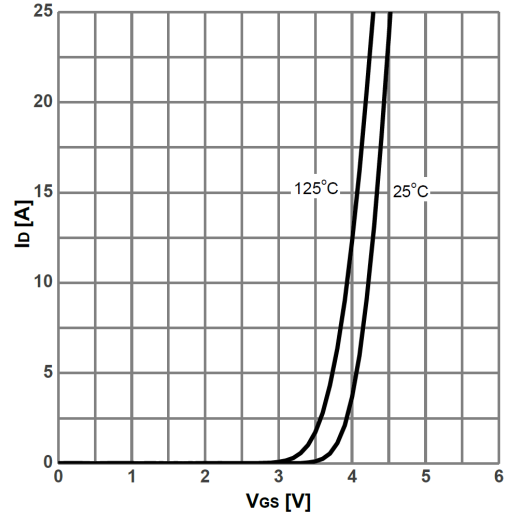


Fig.3 - Drain-Source On-Resistance

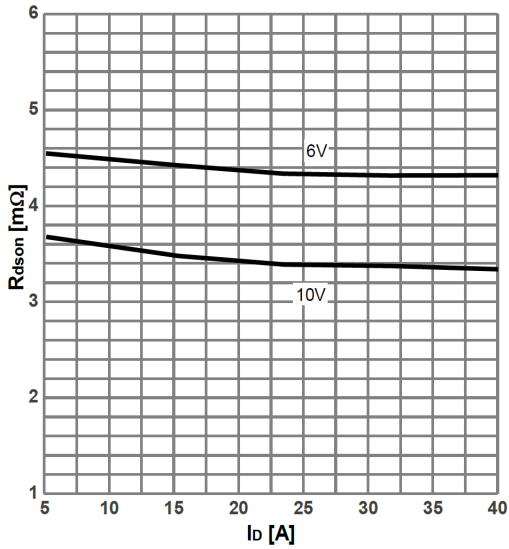


Fig.4 - On-Resistance vs. Junction Temperature

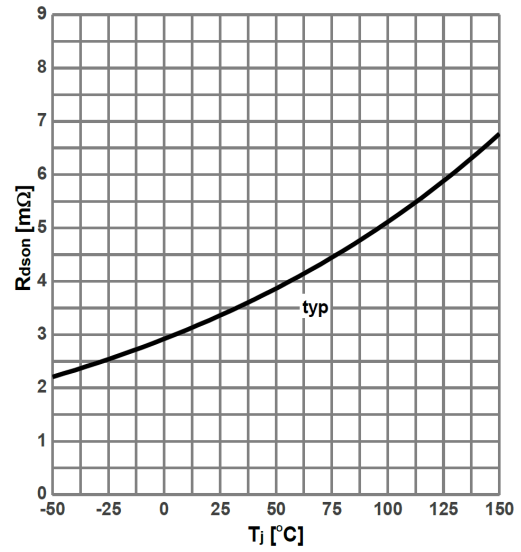


Fig.5 - Drain-Source On-Resistance

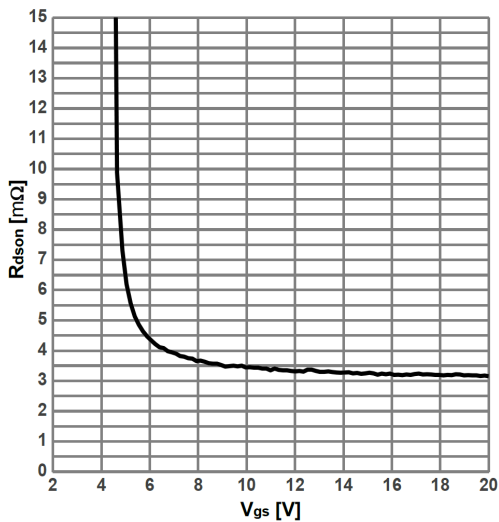
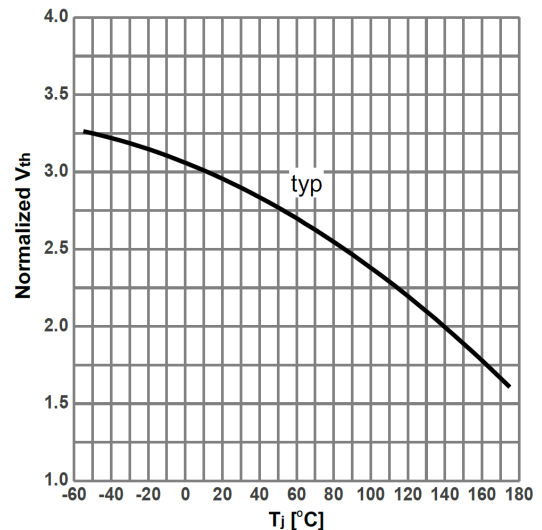


Fig.6 - Threshold Voltage vs. Junction Temperature



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

Fig.7 - Capacitance

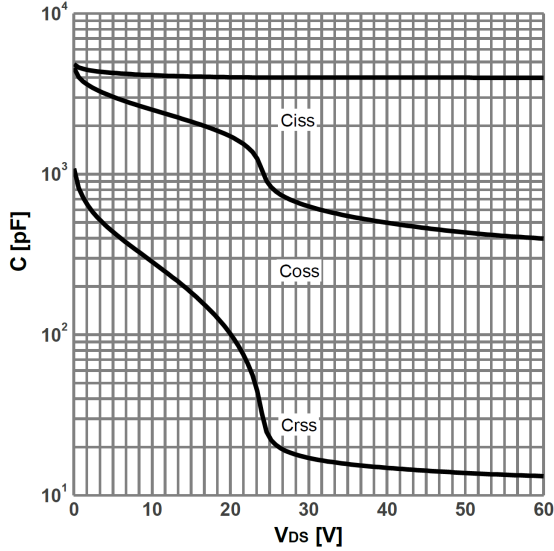


Fig.8 - Gate charge

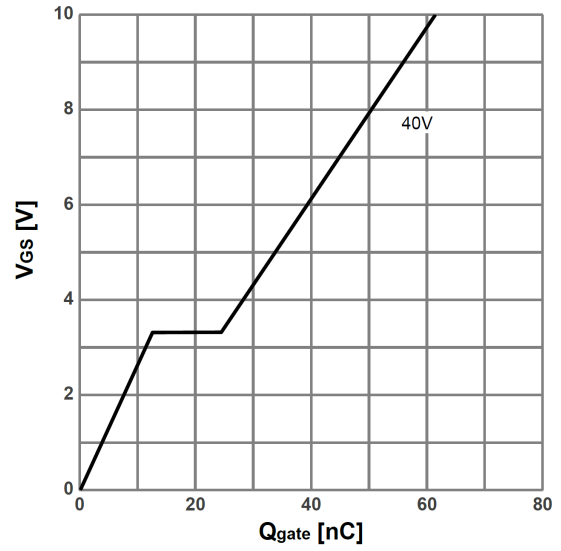


Fig.9 - Forward Characteristic

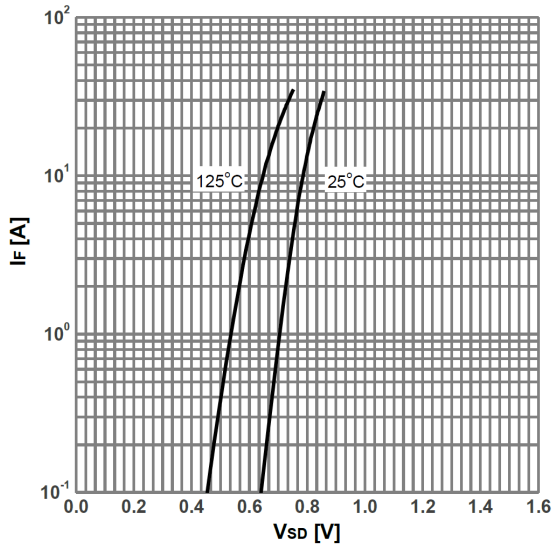


Fig.10 - Safe Operating Area

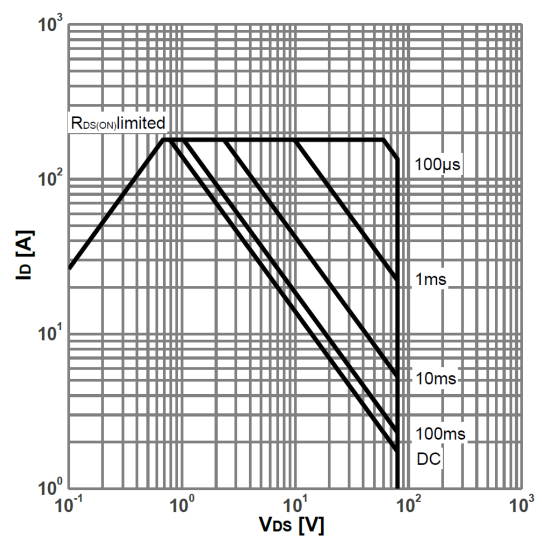


Fig.11 - Thermal Impedance, Junction-Case

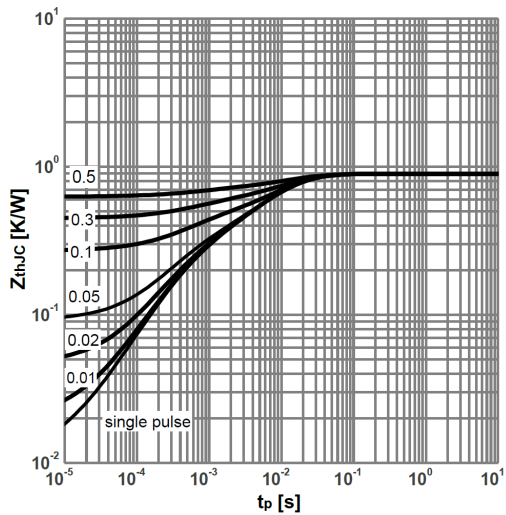
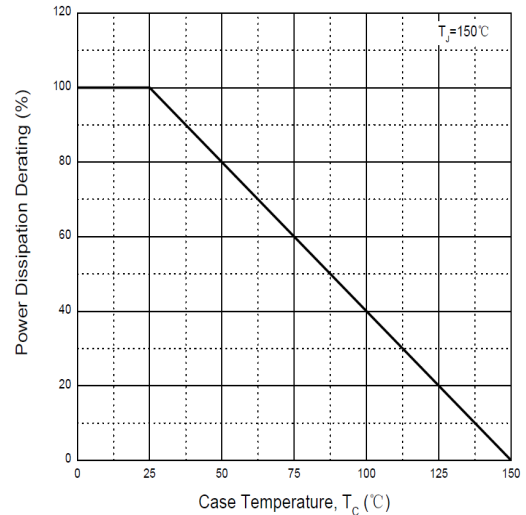
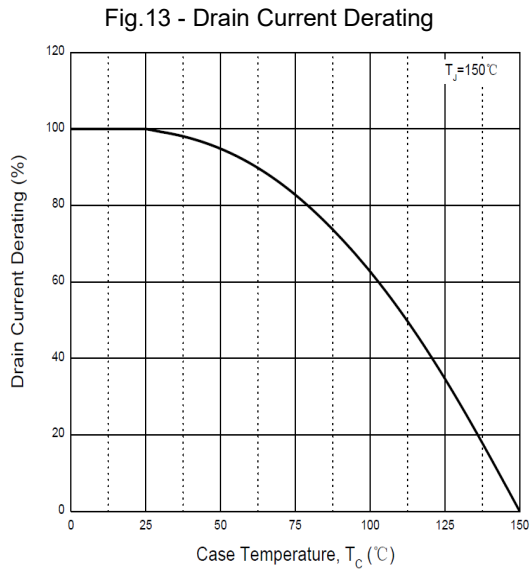


Fig.12 - Power Derating

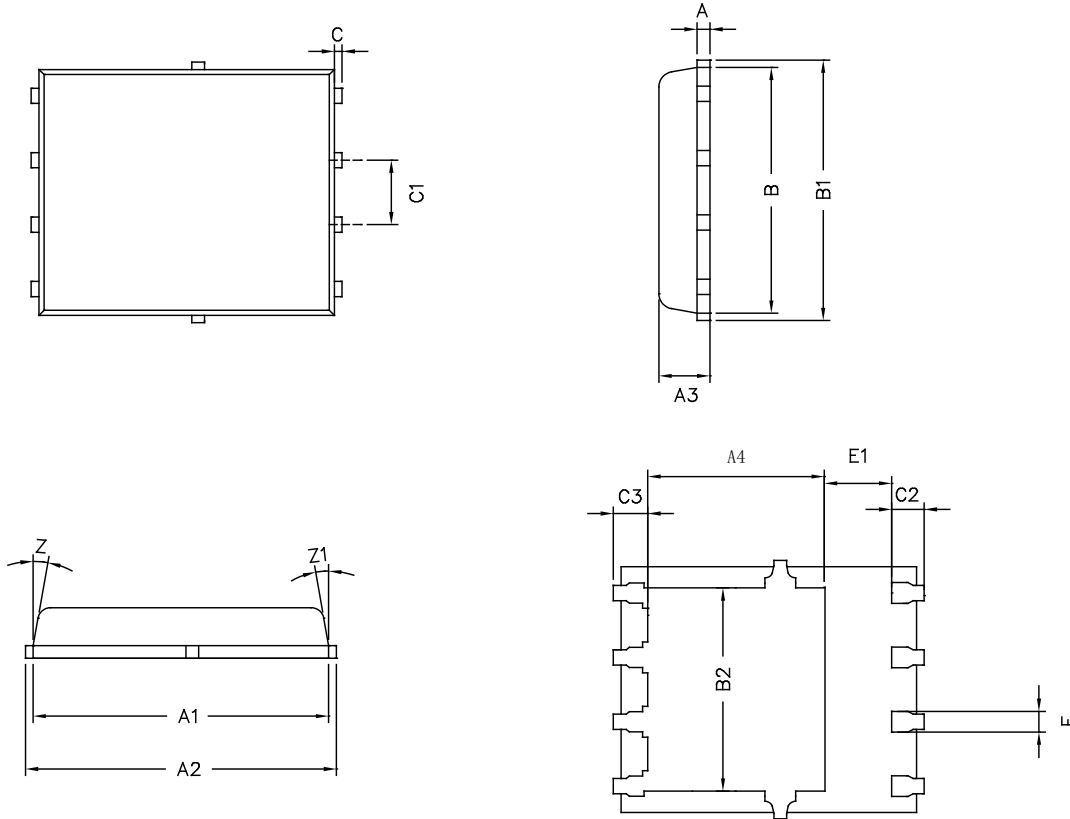


**Typical Characteristics Curves** ( $T_J = 25^\circ\text{C}$  unless otherwise noted)



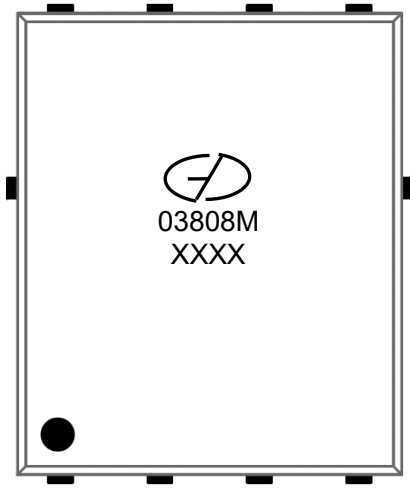
**Package Outline Dimensions** (Unit: millimeters)

**PDFN5060**



PDFN5060							
	Min.	Nom.	Max.		Min.	Nom.	Max.
A	0.15	0.25	0.35	C	0.05	0.15	0.25
A1	5.6	5.8	6.0	C1	1.17	1.27	1.37
A2	5.9	6.1	6.3	C2	0.53	0.63	0.73
A3	0.9	1.0	1.1	C3	0.53	0.63	0.73
A4	-	3.5	-	E	0.31	0.41	0.51
B	4.7	4.9	5.1	E1	1.2	1.3	1.4
B1	5.0	5.2	5.4	Z	8°	10°	12°
B2	-	4.01	-	Z1	8°	10°	12°

## Marking Outline



Part Name: GMN03808M

1. Logo Mark: 
2. P/N Mark: 03808M
3. Date Code: XXXX
4. Pin 1#: ●

## Revision History

Version	Date	Major Changes
Rev.A	2024.09.25	Official Release

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