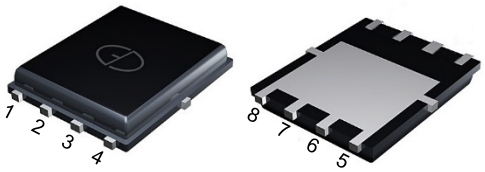
N-Channel 60V (D-S) Power MOSFET

Features

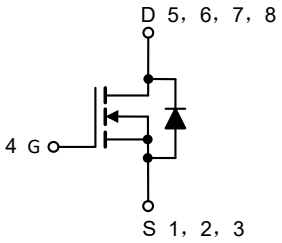
- 100% Avalanche Tested
- Extremely Low Losses with Low FOM Rdson*Qg
- Halogen Free, Pb-Free
- RoHS Compliant



PDFN5060

Applications

- DC-DC
- Motors, lamps
- Power switching



Absolute Maximum Ratings (T_J=25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain Source Voltage		V_{DS}	60	V
Gate Source Voltage		V_{GS}	±20	V
Drain Current, Continuous V_{GS}=10V	T_C=25°C	I_D	143	A
	T_C=100°C		90	
Drain Current, Pulsed *(Note 1)*		I_{DM}	541	A
Single Avalanche Energy *(Note 2)*		E_{AS}	314	mJ
Power Dissipation	T_C=25°C	P_D	104	W
	T_C=100°C		42	
Operating Junction/ Storage Temperature Range		T_J/ T_{STG}	-55 to +150	°C

Note 1: Single pulse; t_p ≤ 1us.
Note 2: V_{DD} = 30V, V_{GS} = 10V, L = 1mH, R_G = 25Ω, starting T_J = 25 °C.

Thermal Characteristics

Parameter	Symbol	Max	Unit
Thermal Resistance Junction to Case	R_{thJC}	1.2	°C/W
Thermal Resistance Junction to Ambient *(Note 3)*	R_{thJA}	45	°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	60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V	--	--	1.0	uA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_{DS}=250uA	1.2	1.7	2.5	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	--	2.4	2.9	mΩ
		V_{GS}=4.5V, I_D=15A	--	3.4	4.1	
Total Gate Charge	Q_g	$V_{GS(off)}$=0V, $V_{GS(on)}$=10V, V_{DD}=30V, I_D=20A	--	42	--	nC
Gate-Source Charge	Q_{gs}		--	6.6	--	
Gate-Drain Charge	Q_{gd}		--	9.3	--	
Turn-on Delay Time	$t_{d(on)}$	V_{GS}=10V, V_{DD}=30V, I_D=20A, R_G=3Ω	--	4.5	--	ns
Turn-on Rise Time	t_r		--	5	--	
Turn-off Delay Time	$t_{d(off)}$		--	32	--	
Turn-off Fall Time	t_f		--	16	--	
Gate Resistance	R_g	V_{GS}=0V, f=1MHz, open drain	--	1.2	--	Ω
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=30V, f=1MHz	--	2376	--	pF
Output Capacitance	C_{oss}		--	1153	--	
Reverse Transfer Capacitance	C_{rss}		--	58	--	

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	--	--	143	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	--	44	--	ns
Reverse Recovery Charge	Q_{rr}		--	38	--	nC

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

Typical Characteristics Curves (T_J = 25℃ unless otherwise noted)

Fig1 - Output Characteristics

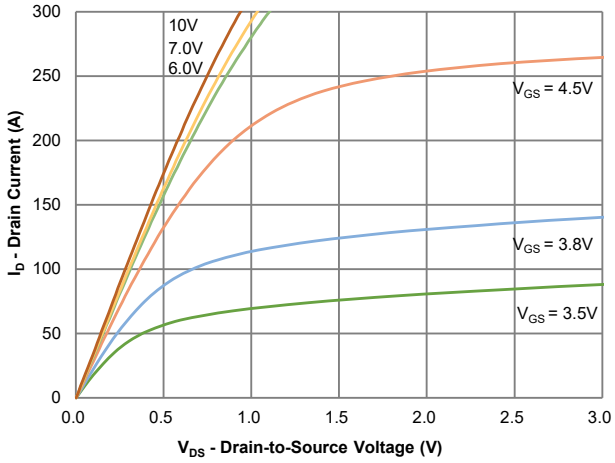


Fig2 - Transfer Characteristics

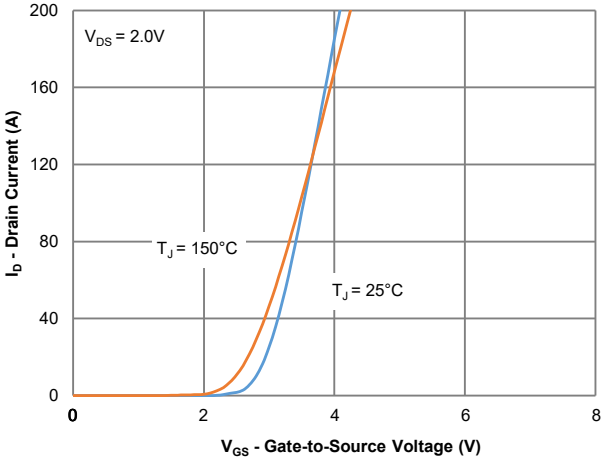


Fig3 - On-Resistance vs. Gate-Source Voltage

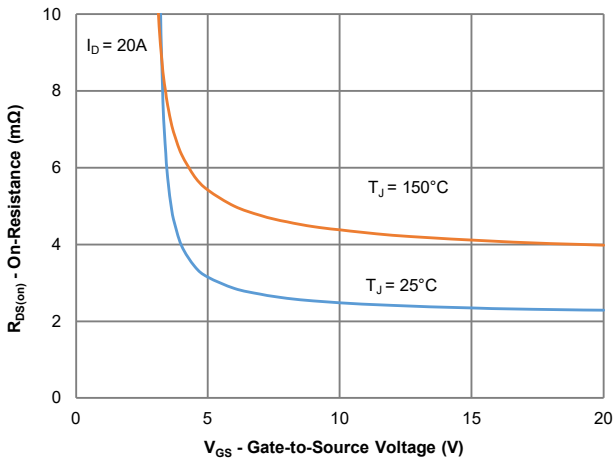


Fig4 - On-Resistance vs. Drain Current and Gate Voltage

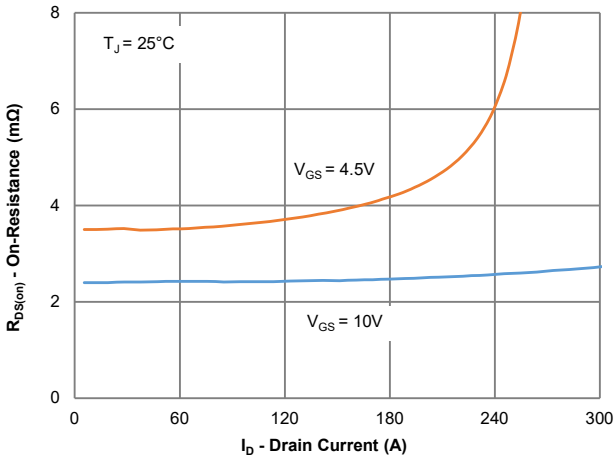


Fig5 - On-Resistance vs. Junction Temperature

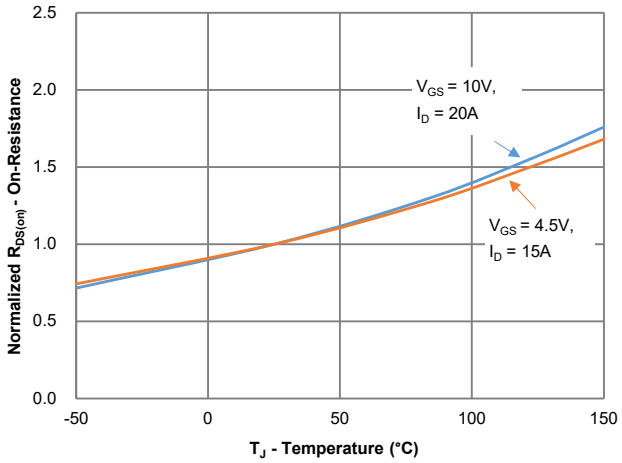
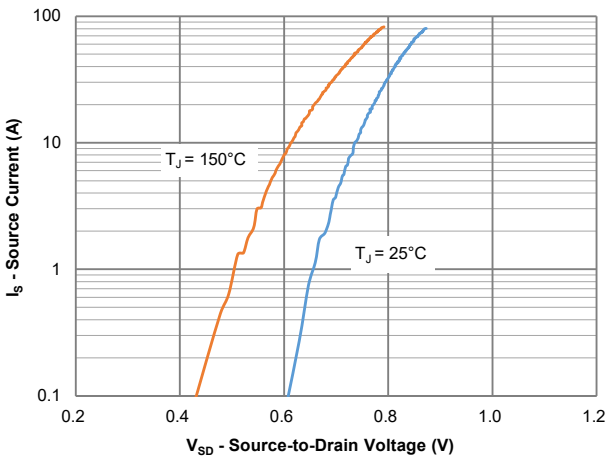


Fig6 - Source-Drain Diode Forward Voltage



Typical Characteristics Curves (T_J = 25℃ unless otherwise noted)

Fig7 - Gate Threshold Variation vs. Junction Temperature

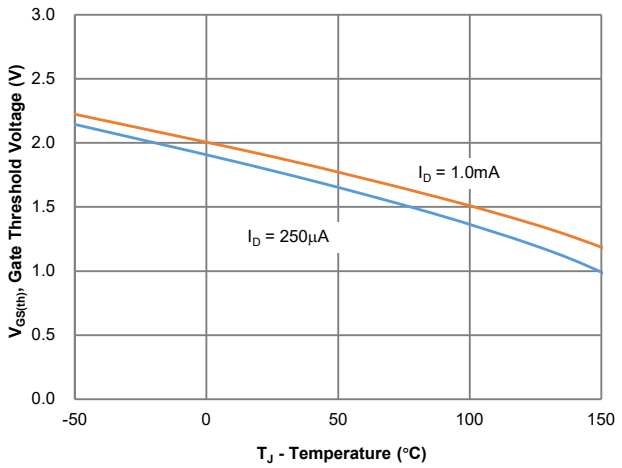


Fig8 - Gate Charge Characteristics

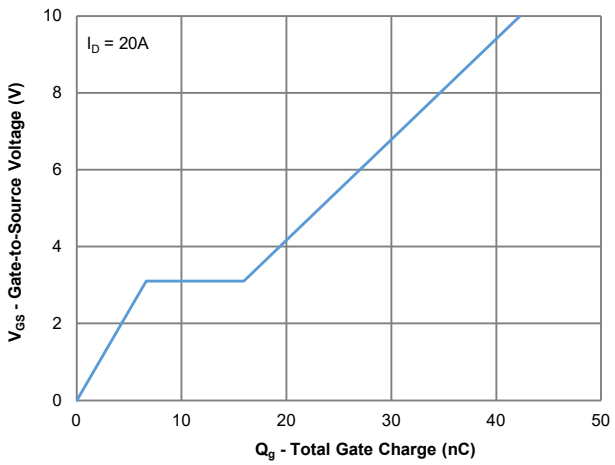


Fig9 - Capacitance Characteristics

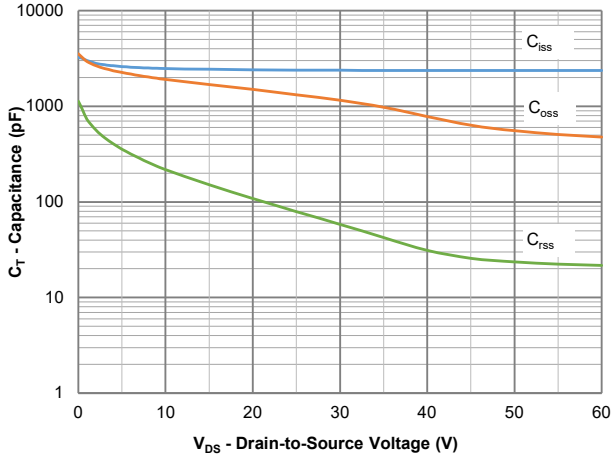


Fig10 - Power Derating

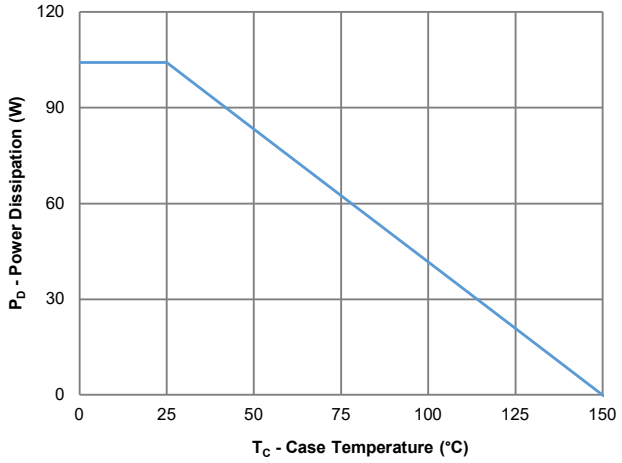


Fig11 - Current Derating

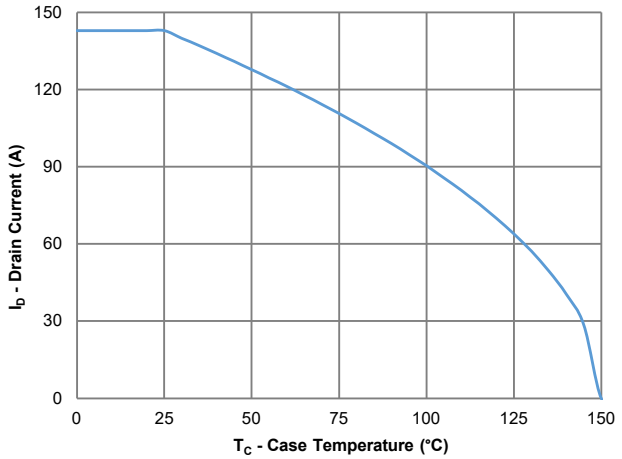
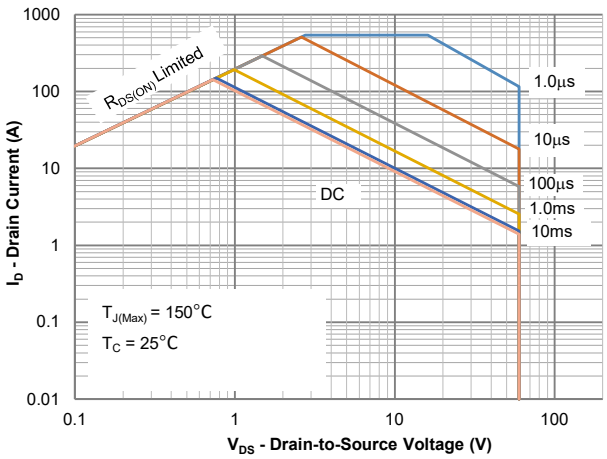
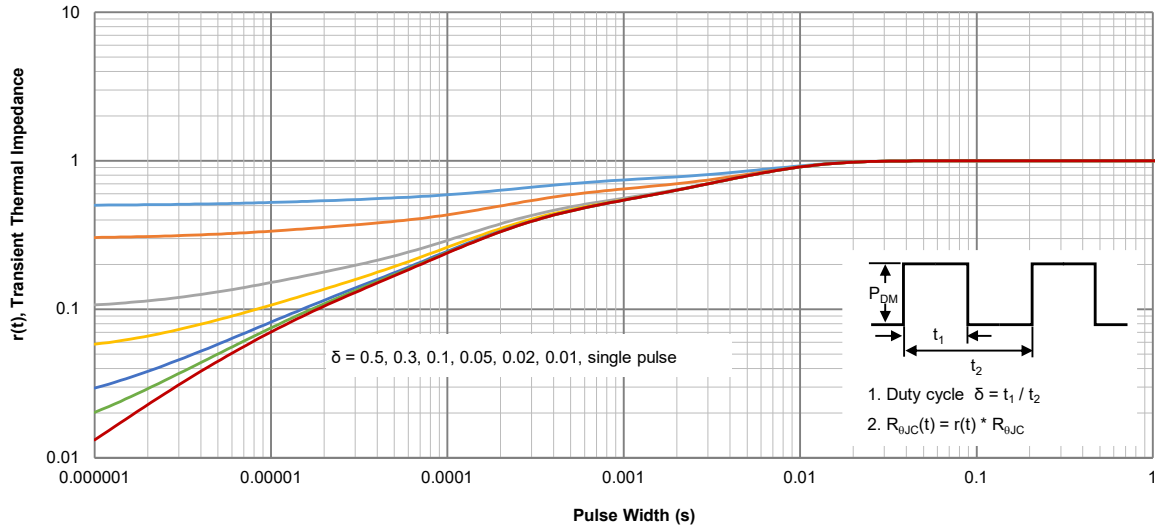


Fig12 - Safe Operating Area



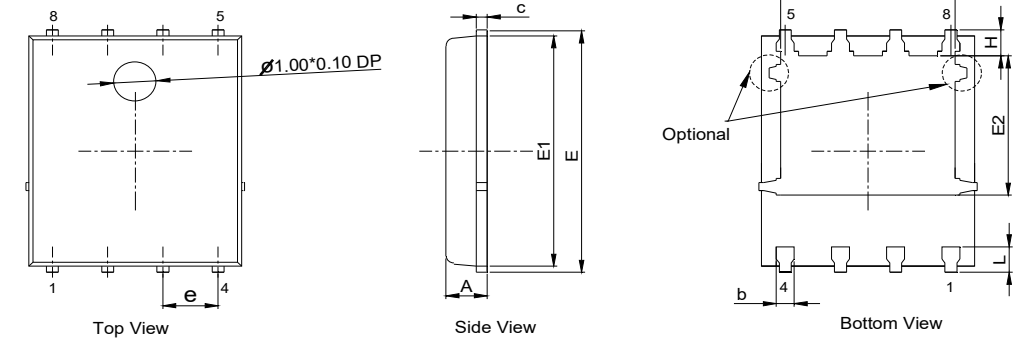
Typical Characteristics Curves (TJ = 25°C unless otherwise noted)

Fig13 - Normalized Maximum Transient Thermal Impedance



Package Outline Dimensions (Unit: millimeters)

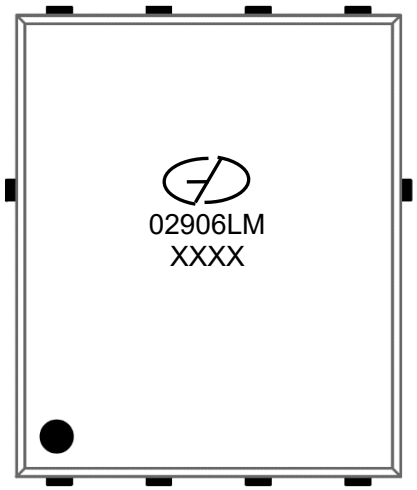
PDFN5060



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M,1994.
2. ALL DIMNESIONS IN MILLIMETER (ANNGLE IN DEGREE).
3. DIMENSIONS D1 AND E1 DO NOT INCLUDE MOLD FLASH PROTRUSIONS OR GATE BURRS.

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
b	0.20	--	0.51
c	0.21	0.25	0.34
D	4.90	--	5.40
D1	4.80	--	5.15
D2	3.70	--	4.20
E	5.90	--	6.50
E1	5.65	5.80	5.95
E2	3.32	3.50	3.63
e	1.27BSC		
H	0.50	--	0.93
L	0.45	--	0.91
θ	0°	--	12°

Marking Outline



Part Name: GMN02906LM

1. Logo Mark:
2. P/N Mark: 02906LM
3. Date Code: XXXX
4. Pin 1#: ●

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