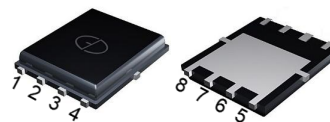


N-Channel 30V (D-S) Power MOSFET

Features

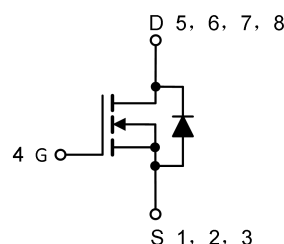
- 100% Avalanche Tested
- Extremely Low Losses with Low FOM $R_{DS(on)} \cdot Q_g$
- RoHS Compliant, Halogen Free, Pb-Free



PDFN3333

Applications

- Automotive 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}	30	V
Gate Source Voltage	V_{GS}	± 20	V
Drain Current, Continuous $V_{GS}=10\text{V}$	I_D	$T_C=25^\circ\text{C}$ 147	A
		$T_C=100^\circ\text{C}$ 93	
Drain Current, Pulsed (Note 1)	I_{DM}	587	A
Single Avalanche Energy (Note 2)	E_{AS}	336	mJ
Power Dissipation	P_D	$T_C=25^\circ\text{C}$ 42	W
		$T_C=100^\circ\text{C}$ 17	
Operating Junction/ Storage Temperature Range	T_J / T_{STG}	-55 to +150	$^\circ\text{C}$

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

Note 2: $V_{DD} = 15\text{V}$, $V_{GS} = 10\text{V}$, $L = 1\text{mH}$, starting $T_J = 25^\circ\text{C}$.

Thermal Characteristics

Parameter	Symbol	Max	Unit
Thermal Resistance Junction to Case	R_{thJC}	3	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient (Note 3)	R_{thJA}	50	$^\circ\text{C/W}$

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	30	--	--	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	--	--	1	uA
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =250uA	1.2	--	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	--	0.99	1.25	mΩ
		V _{GS} =4.5V, I _D =20A	--	1.6	2.2	
Total Gate Charge	Q _g	V _{DS} = 15V, I _D = 20A V _{GS} = 10V	--	48	--	nC
Gate-Source Charge	Q _{gs}		--	5.6	--	
Gate-Drain Charge	Q _{gd}		--	5.8	--	
Turn-on Delay Time	t _{d(on)}	V _{GS} = 10V, V _{DS} = 15V I _D = 20A, R _{GEN} = 3.0Ω	--	5	--	ns
Turn-on Rise Time	t _r		--	13	--	
Turn-off Delay Time	t _{d(off)}		--	46	--	
Turn-off Fall Time	t _f		--	18	--	
Gate Resistance	R _g	V _{GS} =0V, f=1MHz, open drain	--	1.9	--	Ω
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V, f=1MHz	--	2978	--	pF
Output Capacitance	C _{oss}		--	2050	--	
Reverse Transfer Capacitance	C _{rss}		--	160	--	

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	--	--	60	A
Diode Forward Voltage (Note 4)	V _{SD}	I _F =2A, V _{GS} =0V	--	--	1.2	V
Reverse Recovery Time	T _{rr}	I _F = 20A, di/dt = 100 A/μs	--	57	--	ns
Reverse Recovery Charge	Q _{rr}		--	53	--	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

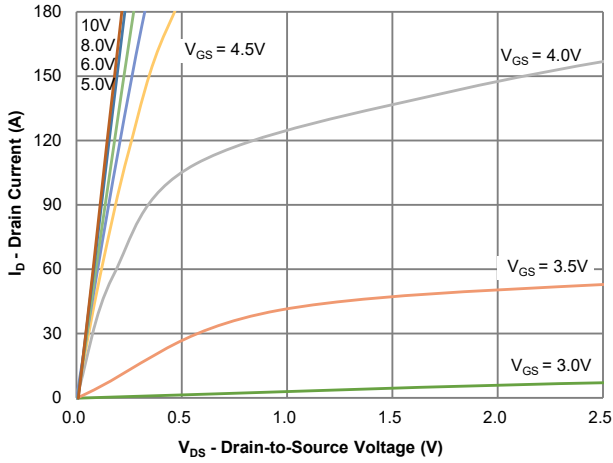


Fig.2-Transfer Characteristics

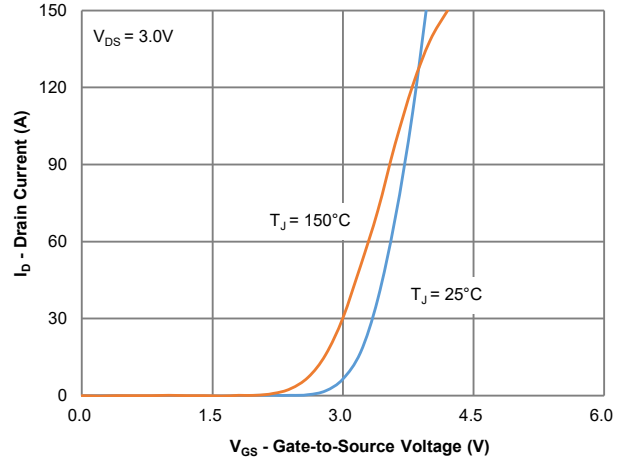


Fig.3 -On-Resistance vs. Gate-Source Voltage

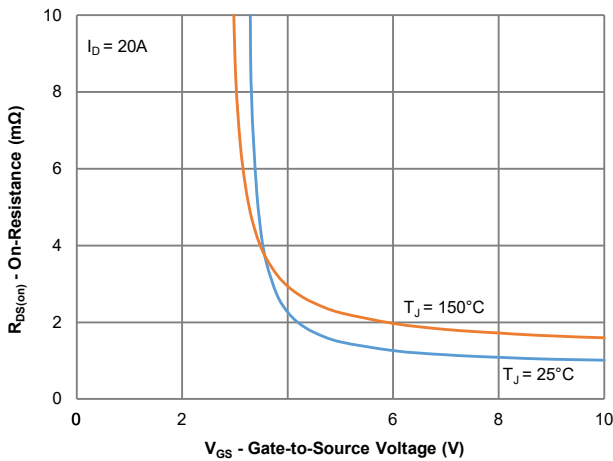


Fig.4 -On-Resistance vs. Drain Current and Gate Voltage

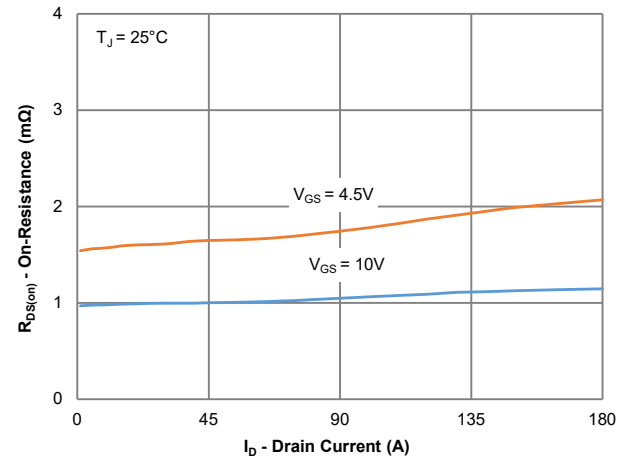


Fig.5 -On-Resistance vs. Junction Temperature

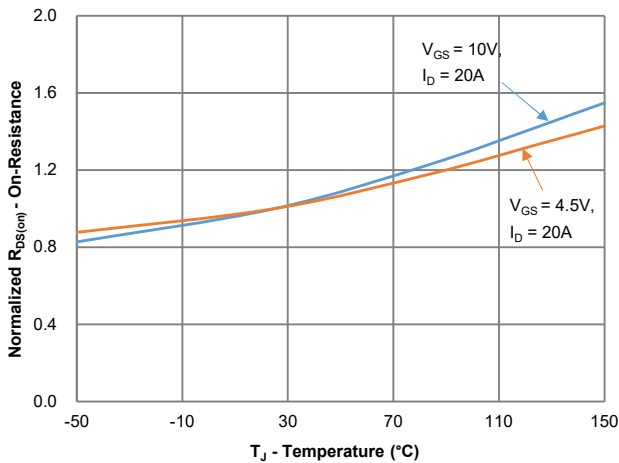
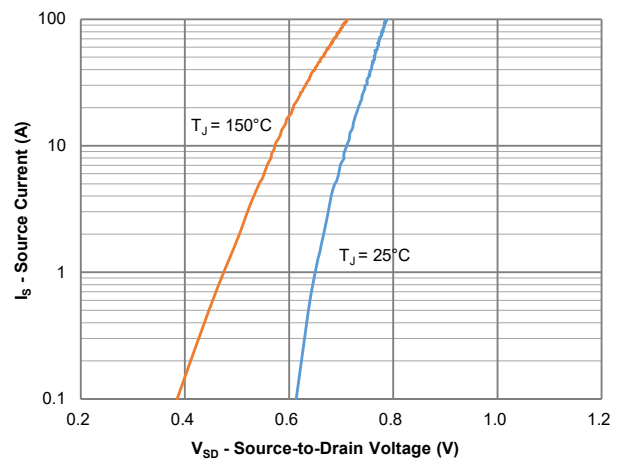


Fig.6 -Source-Drain Diode Forward Voltage



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

Fig.7 -Gate Threshold Variation vs. Junction Temperature

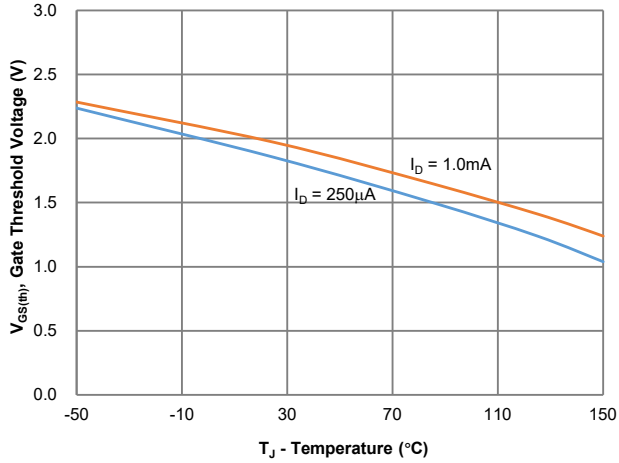


Fig.8 -Gate Charge Characteristics

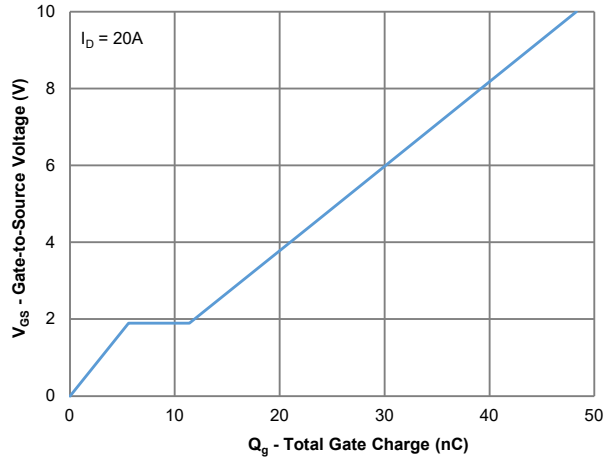


Fig.9-Capacitance Characteristics

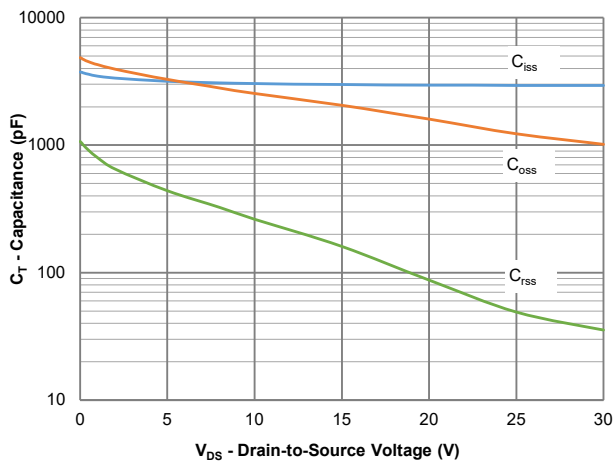


Fig.10 -Power Derating

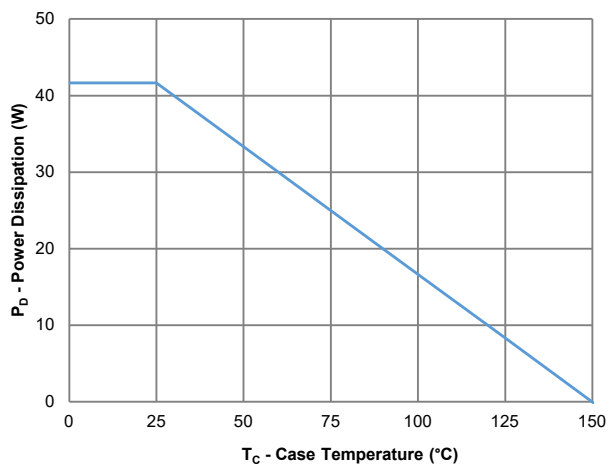


Fig.11 -Current Derating

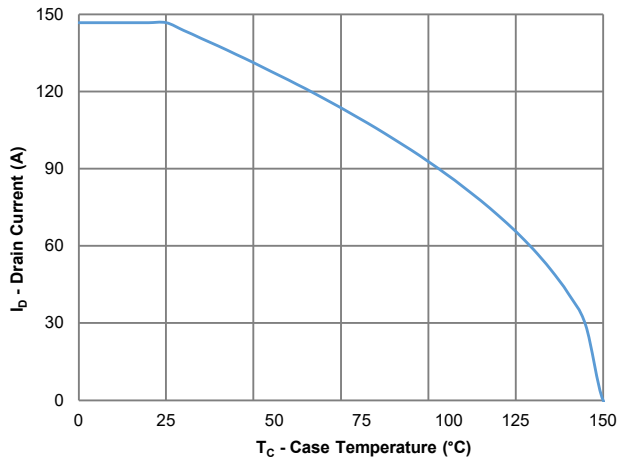
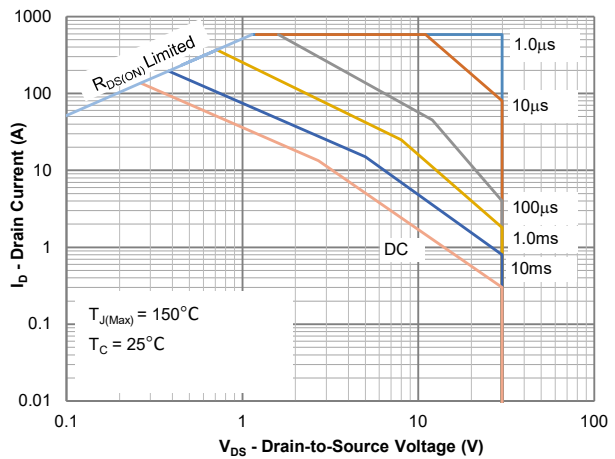
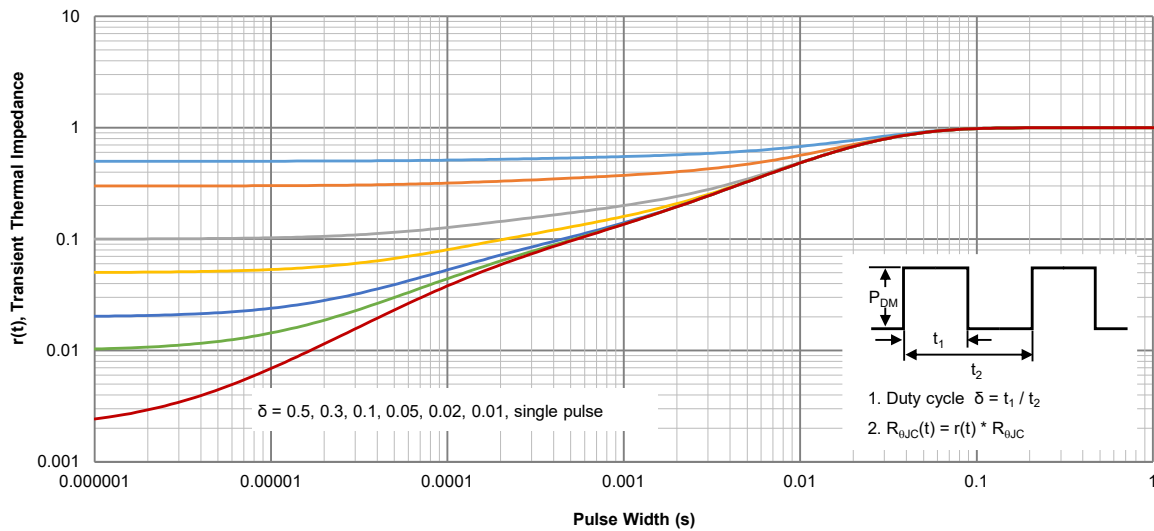


Fig.12 -Safe Operating Area



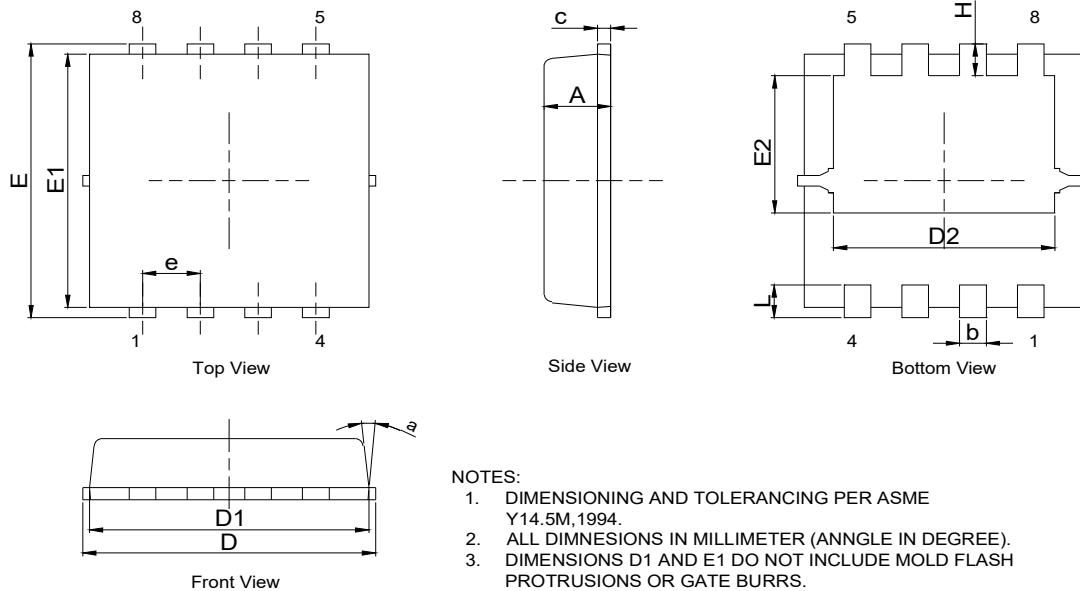
Typical Characteristics Curves (T_J = 25°C unless otherwise noted)

Fig.13 -Normalized Maximum Transient Thermal Impedance



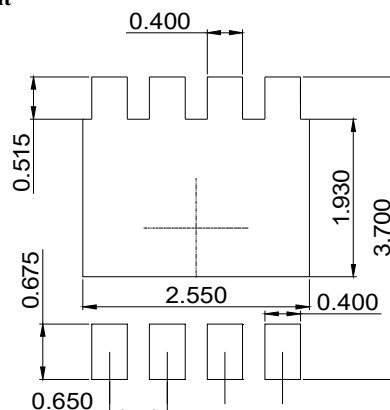
Package Outline Dimensions

PDFN3333



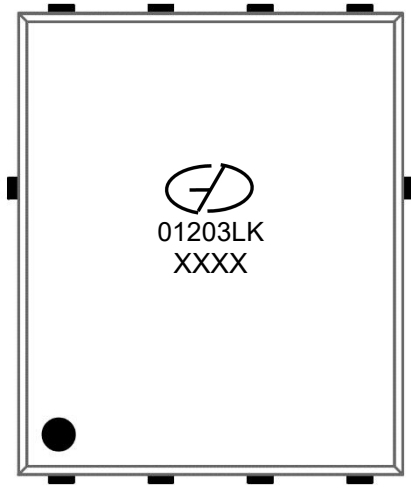
DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	0.70	0.80	0.90
b	0.20	0.30	0.40
c	0.10	0.15	0.25
D	3.10	3.30	3.40
D1	3.00	3.15	3.25
D2	2.35	--	2.69
E	3.20	3.35	3.45
E1	2.85	3.10	3.20
E2	1.48	--	1.98
e	0.65 BSC		
H	0.25	--	0.60
L	0.25	0.40	0.50
a	---	---	15°

Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS

Marking Outline



Part Name: GMN01203LK

1. Logo Mark: 
2. P/N Mark: 01203LK
3. Date Code: XXXX
4. Pin 1#: ●

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