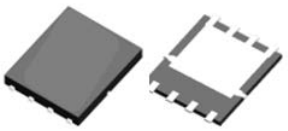
40V N-Channel Power MOSFET

V_{DS}	40V
I_{D_MAX}	214A
$R_{DS(ON)\_MAX}$ @V_{GS}=10V	1.4mΩ

DESCRIPTION：
- Low On-Resistance
- 100% UIS Tested, 100% Rg Tested
- RoHS compliant
- Halogen Free

TYPICAL APPLICATIONS：
- Motor Drive
- Load switching
- High frequency switching, synchronous rectification



PDFN5060-8L

MAXIMUM RATINGS (at T_C = 25 °C, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	Tc=25℃ Tc=100℃	I_D	214 135	A
Pulse Drain Current (1)		I_{DM}	856	A
Single Pulse Avalanche Energy (2)		E_{AS}	490	mJ
Single Pulse Avalanche Current	L=0.1mH	I_{AS}	50	A
Maximum Power Dissipation	Tc=25℃ Tc=100℃	P_D	104 42	W
Junction & Storage Temperature Range		T_J , T_{STG}	-55~+150	℃

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal Resistance, Junction to Ambient		$R_{\theta JA}$	45	℃/W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	1.2	℃/W

Notes:
1.This current is calculated on single pulse with 10us Single Pulse & Duty Cycle = 1%
2. Defined by design, not subject to production test, EAS condition: TJ=25°C, VDD=20V, VGS=10V, L=1.0mH.

ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	$V_{(BR)DSS}$	40			V
Zero Gate Voltage Drain Current VDS = 40 V, VGS = 0 V Tj=25℃ VDS = 40 V, VGS = 0 V Tj=125℃	I_{DSS}			1 100	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source Threshold Voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	1.2	1.7	2.5	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A VGS = 4.5V, ID = 15A	$R_{DS(ON)}$		1.2 1.7	1.4 2.2	mΩ
Forward Transconductance VDS = 5V, ID = 20A	$G_{fS)}$		56		S
Input capacitance f=1MHz, VDS=20 V, VGS=0 V	C_{iss}		3008		pF
Output capacitance f=1MHz, VDS=20 V, VGS=0 V	C_{oss}		1635		pF
Reverse transfer capacitance f=1MHz, VDS=20 V, VGS=0 V	C_{rss}		68		pF
Gate Resistance f=1MHz, VDS=0 V, VGS=0 V	R_g		1.3		Ω
Total Gate Charge VDS= 20V, ID= 20A,VGS= 10V	Q_G		44		nC
Gate to Source Charge VDS= 20V, ID= 20A,VGS= 10V	Q_{GS}		9.5		nC
Gate to Drain Charge VDS= 20V, ID= 20A,VGS= 10V	Q_{GD}		6.7		nC
Turn-on delay time VDS=20 V, ID=20A, VGS= 10V, R_{GEN}=3Ω	td $_{(ON)}$		4.6		ns
Rise time VDS=20 V, ID=20A, VGS= 10V, R_{GEN}=3Ω	tr		9.6		ns
Turn-off delay time VDS=20 V, ID=20A, VGS= 10V, R_{GEN}=3Ω	td $_{(OFF)}$		31		ns
Fall time VDS=20 V, ID=20A, VGS= 10V, R_{GEN}=3Ω	tf		14		ns

Body Diode

ELECTRICAL CHARATERISTICS (at TJ = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Diode Forward Voltage VGS = 0V, I_S = 2.0A Tj=25℃	V_{SD}		0.7	1.2	V
Diode Forward Current Tj=25℃	I_S			214	A
Revers Recovery Time IF=20A, dI/dt = 100A/us□Tj=25℃	Trr		49		ns
Revers Recovery Charge IF=20A, dI/dt = 100A/us□Tj=25℃	Qrr		55		nC

Typical Electrical and Thermal Characteristics

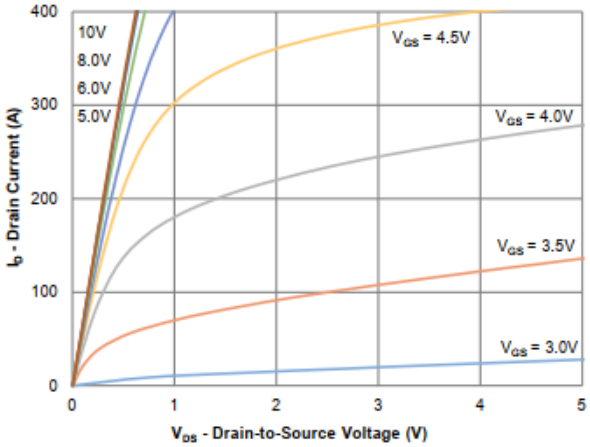


Figure 1. Typical output characteristics (Tj=25℃)

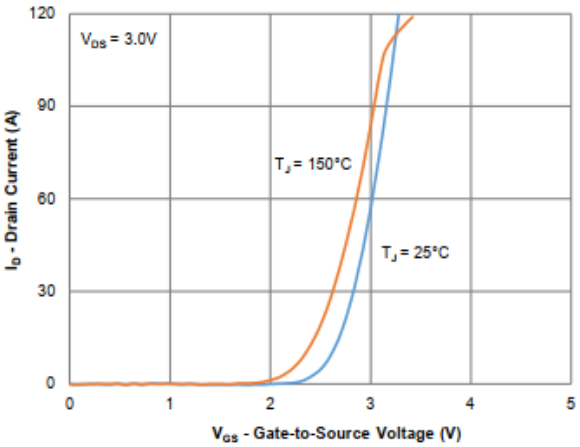


Figure 2. Typical Transfer Characteristics

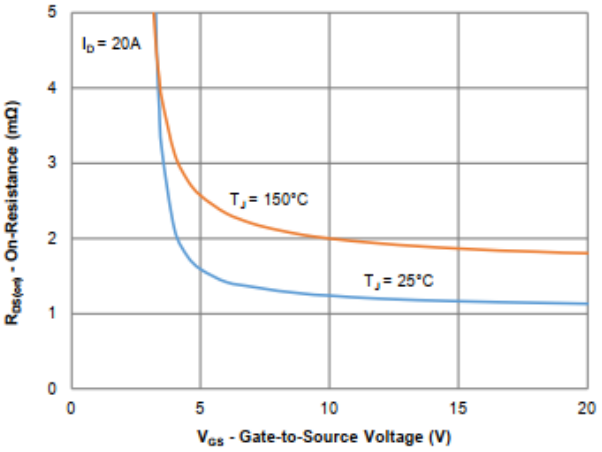


Figure 3. On-Resistance vs. Gate-Source Voltage

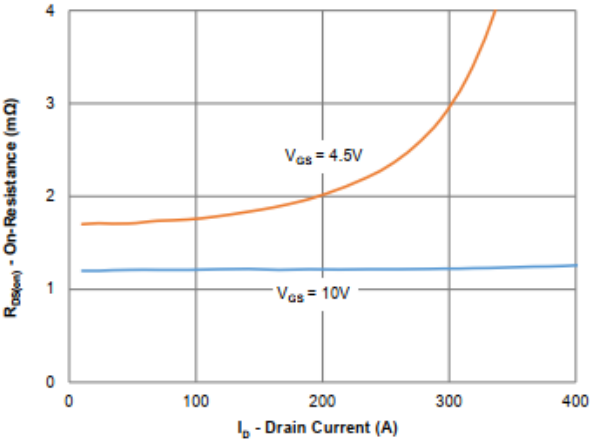


Figure 4. On-Resistance vs. Gate-Source Voltage

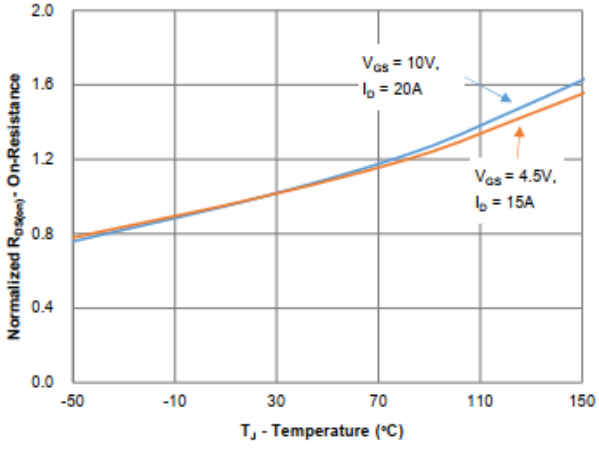


Figure 5. On-Resistance vs. Junction Temperature

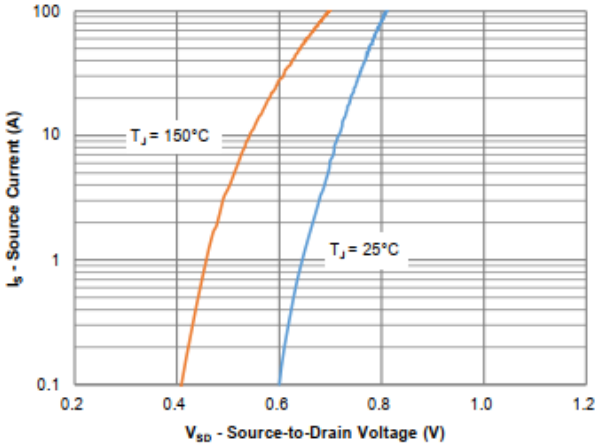


Figure 6. Source-Drain Diode Forward Voltage

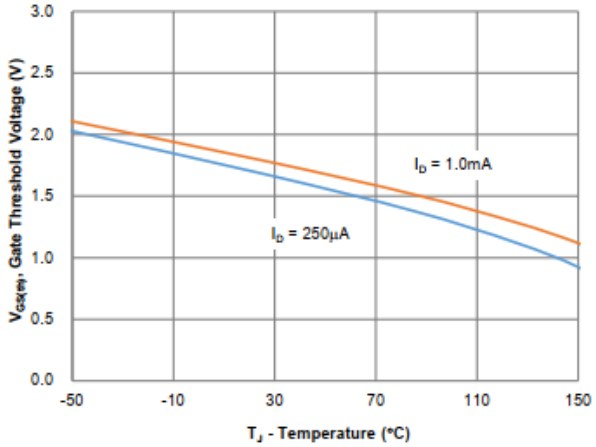


Figure 7. Gate Threshold Variation vs. Junction Temperature

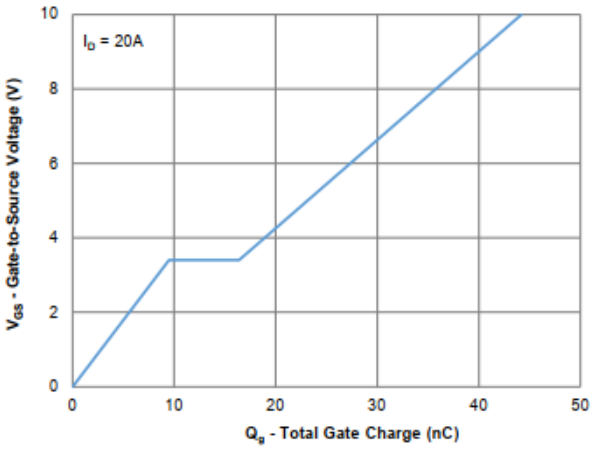


Figure 8. Gate Charge Characteristics

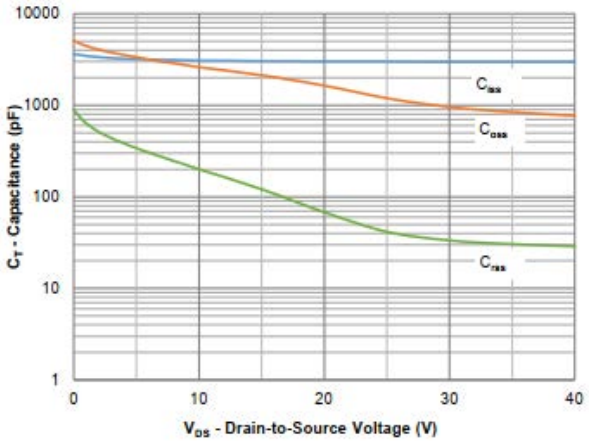


Figure 9. Capacitance Characteristics

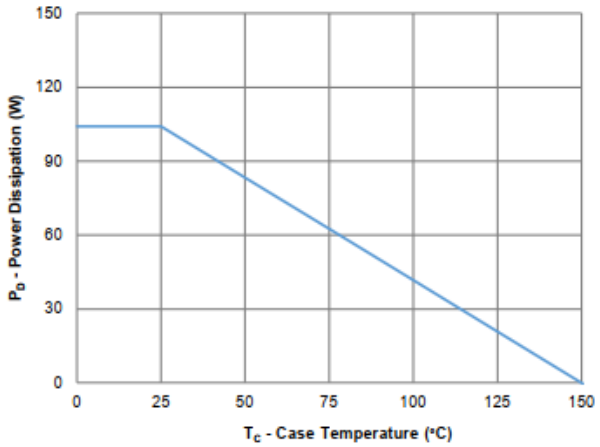


Figure 10. Power Derating

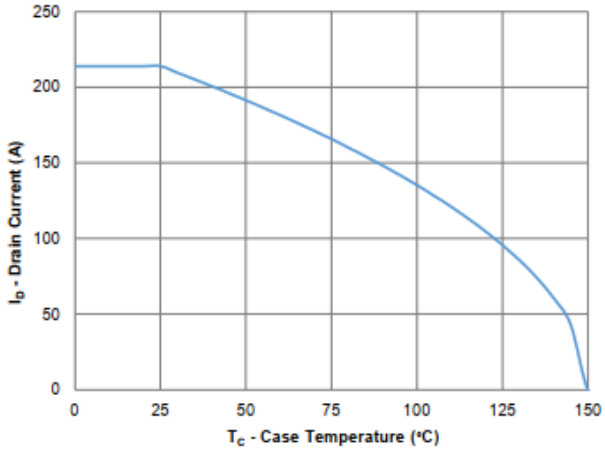


Figure 11. Current Derating

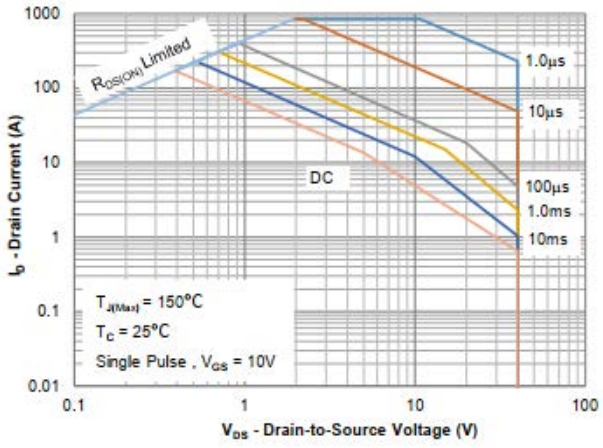


Figure 12. Safe Operating Area

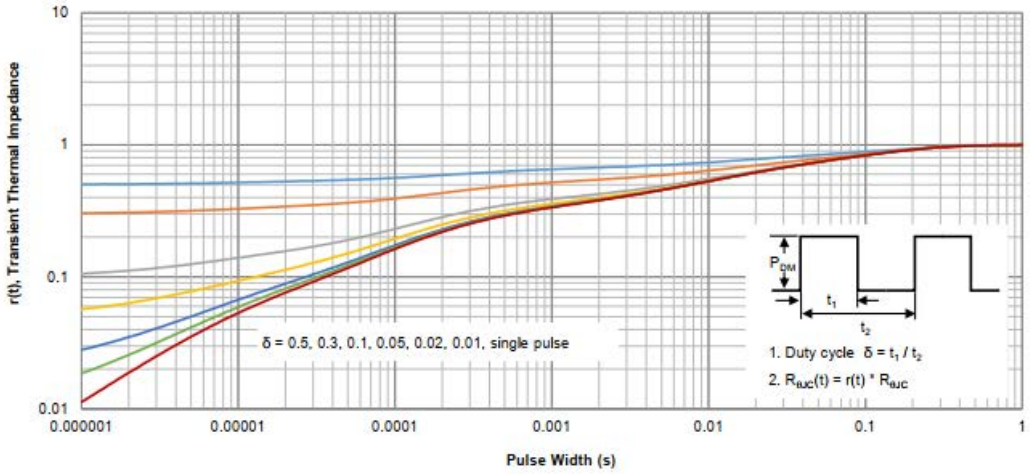
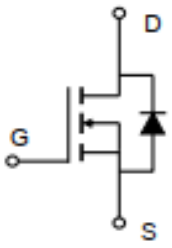
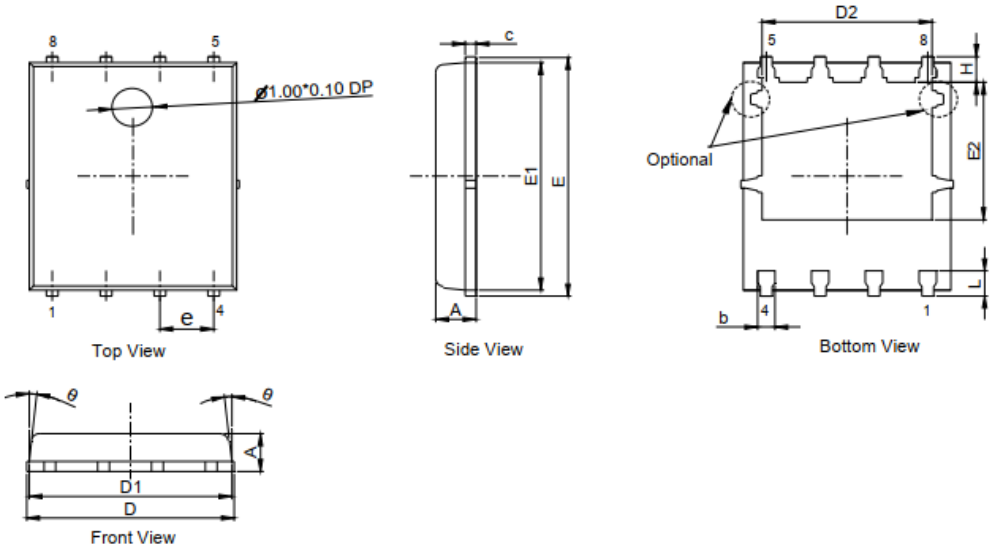


Figure 13. Max. Normalized Maximum Transient Thermal Impedance

- Circuit diagram



- PDFN5060-8L Package outlines : Dimensions in (mm)



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	3.91	--	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°

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