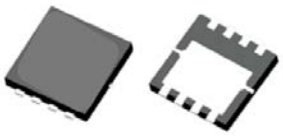
30V N-Channel Power MOSFET

V_{DS}	30V
I_{D_MAX}	140A
$R_{DS(ON)\_MAX}$ @V_{GS}=10V	1.35mΩ

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

TYPICAL APPLICATIONS：
- Motor Drive
- Li- Battery Protection
- Power Management for High Performance Application



PDFN3333-8L

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

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	Tc=25℃ Tc=100℃	I_D	140 89	A
Pulse Drain Current (1)		I_{DM}	561	A
Single Pulse Avalanche Energy (2)		E_{AS}	336	mJ
Single Pulse Avalanche Current	L=0.3mH	I_{AS}	45	A
Maximum Power Dissipation	Tc=25℃ Tc=100℃	P_D	42 17	W
Junction & Storage Temperature Range		T_J , T_{STG}	-55~+150	℃

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal Resistance, Junction to Ambient		$R_{\theta JA}$	50	℃/W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	3.0	℃/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=15V, 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	$V_{(BR)DSS}$	30			V
Zero Gate Voltage Drain Current VDS = 30 V, VGS = 0 V Tj=25℃ VDS = 30 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	1.6	2.5	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A VGS = 4.5V, ID = 20A	$R_{DS(ON)}$		1.05 1.60	1.35 2.20	mΩ
Forward Transconductance VDS = 5V, ID = 20A	$G_{fS)}$		45		S
Input capacitance f=1MHz, VDS=15 V, VGS=0 V	C_{iss}		2854		pF
Output capacitance f=1MHz, VDS=15 V, VGS=0 V	C_{oss}		1839		pF
Reverse transfer capacitance f=1MHz, VDS=15 V, VGS=0 V	C_{rss}		118		pF
Gate Resistance f=1MHz, VDS=0 V, VGS=0 V	R_g		1.6		Ω
Total Gate Charge VDS= 15V, ID= 20A,VGS= 10V	Q_G		43		nC
Gate to Source Charge VDS= 15V, ID= 20A,VGS= 10V	Q_{GS}		7.3		nC
Gate to Drain Charge VDS= 15V, ID= 20A,VGS= 10V	Q_{GD}		7.2		nC
Turn-on delay time VDS=15 V, ID=20A, VGS= 10V, R_{GEN}=3Ω	td $_{(ON)}$		5.3		ns
Rise time VDS=15 V, ID=20A, VGS= 10V, R_{GEN}=3Ω	tr		4.2		ns
Turn-off delay time VDS=15 V, ID=20A, VGS= 10V, R_{GEN}=3Ω	td $_{(OFF)}$		36		ns
Fall time VDS=15 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			122	A
Revers Recovery Time IF=20A, dI/dt = 100A/us□Tj=25℃	Trr		47		ns
Revers Recovery Charge IF=20A, dI/dt = 100A/us□Tj=25℃	Qrr		36		nC

Typical Electrical and Thermal Characteristics

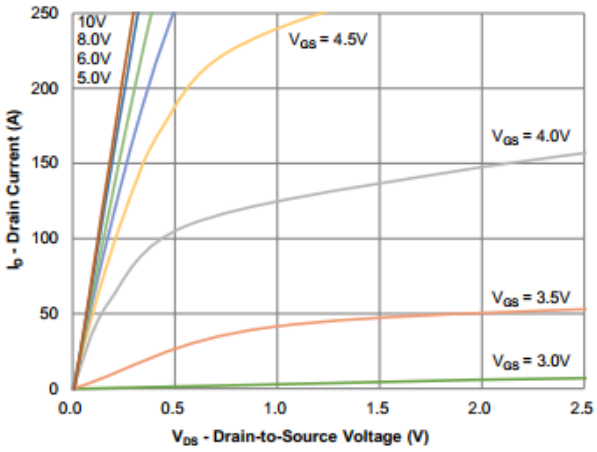


Figure 1. Typical output characteristics (Tj=25℃)

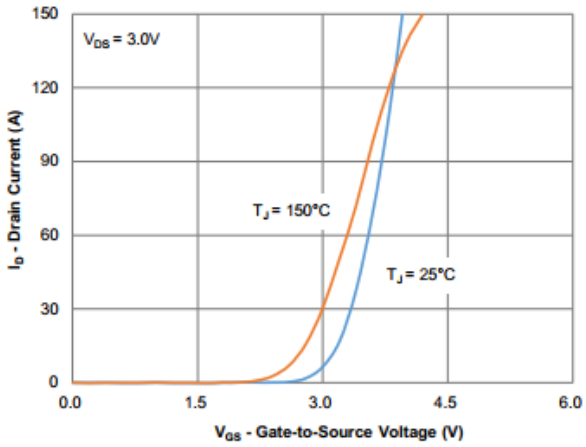


Figure 2. Typical Transfer Characteristics

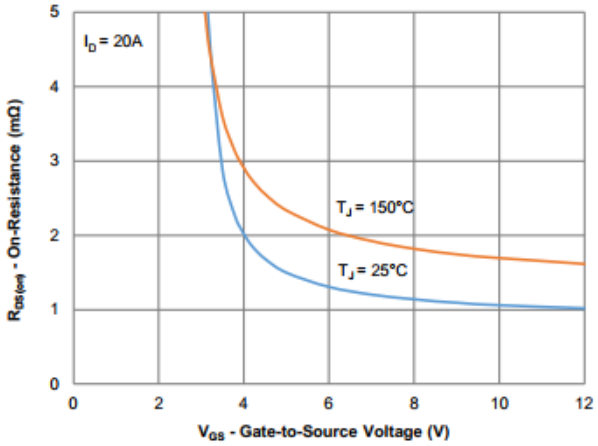


Figure 3. On-Resistance vs. Gate-Source Voltage

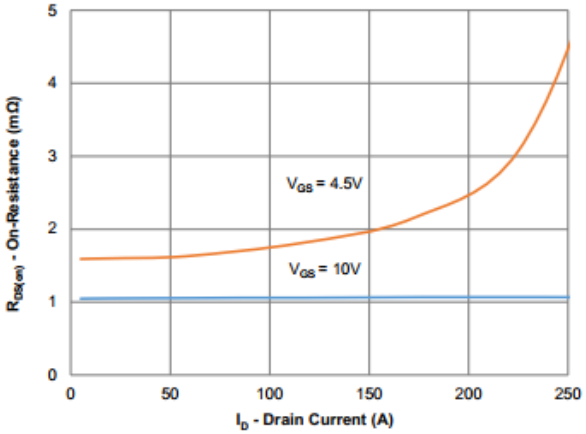


Figure 4. On-Resistance vs. Gate-Source Voltage

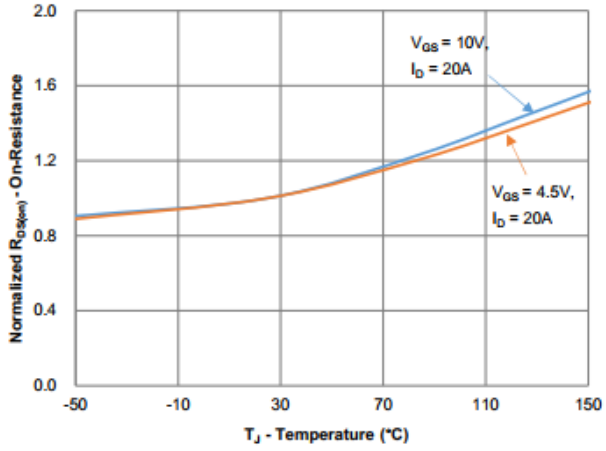


Figure 5. On-Resistance vs. Junction Temperature

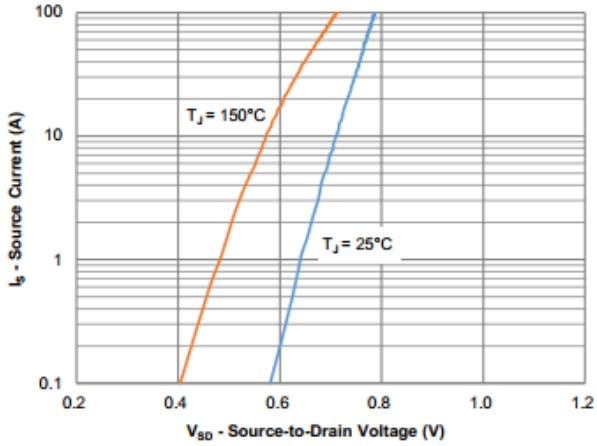


Figure 6. Source-Drain Diode Forward Voltage

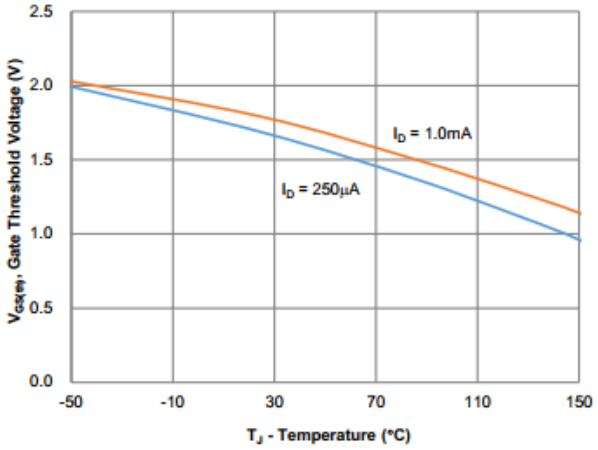


Figure 7. Gate Threshold Variation vs. Junction Temperature

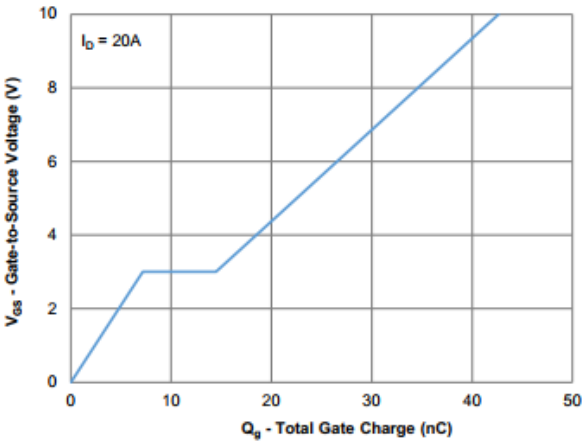


Figure 8. Gate Charge Characteristics

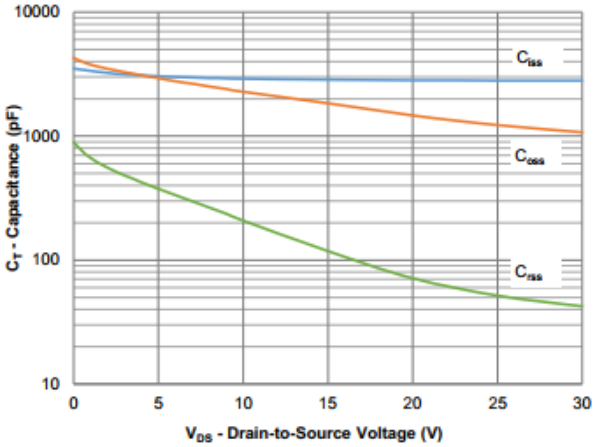


Figure 9. Capacitance Characteristics

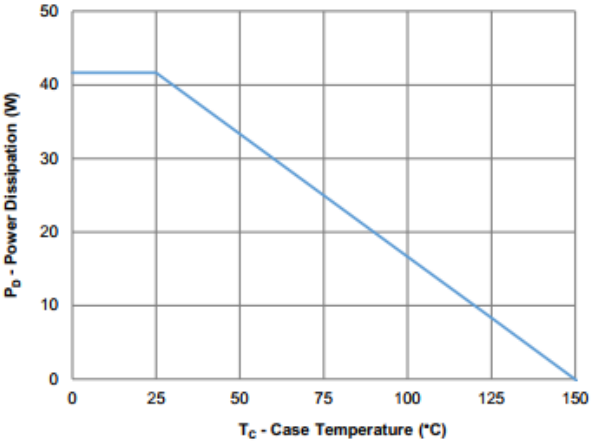


Figure 10. Power Derating

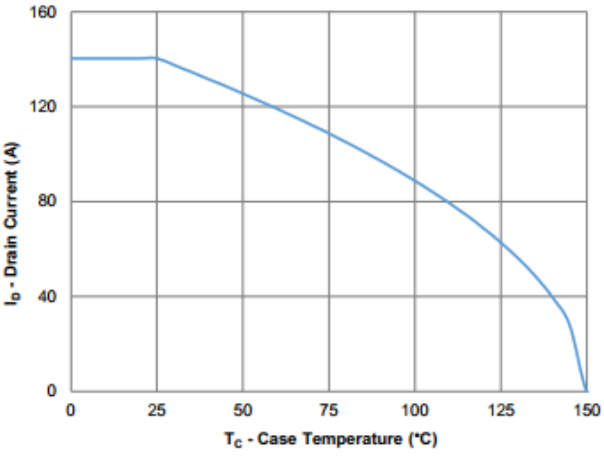


Figure 11. Current Derating

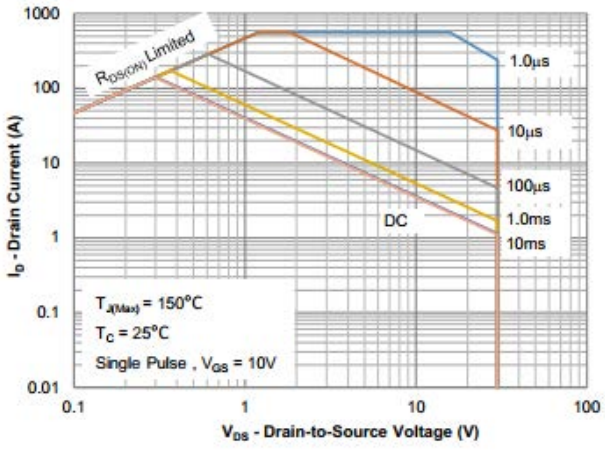


Figure 12. Safe Operating Area

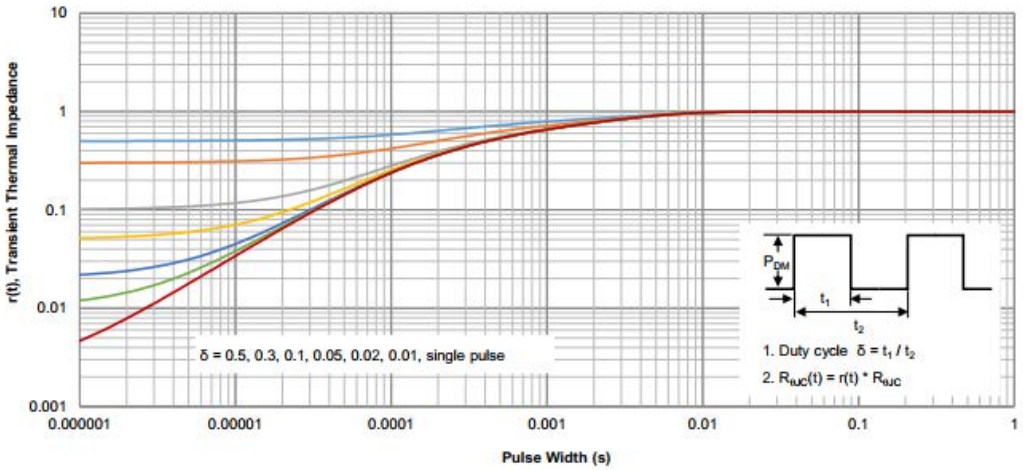
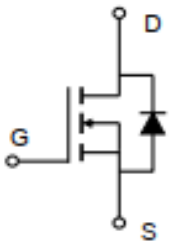
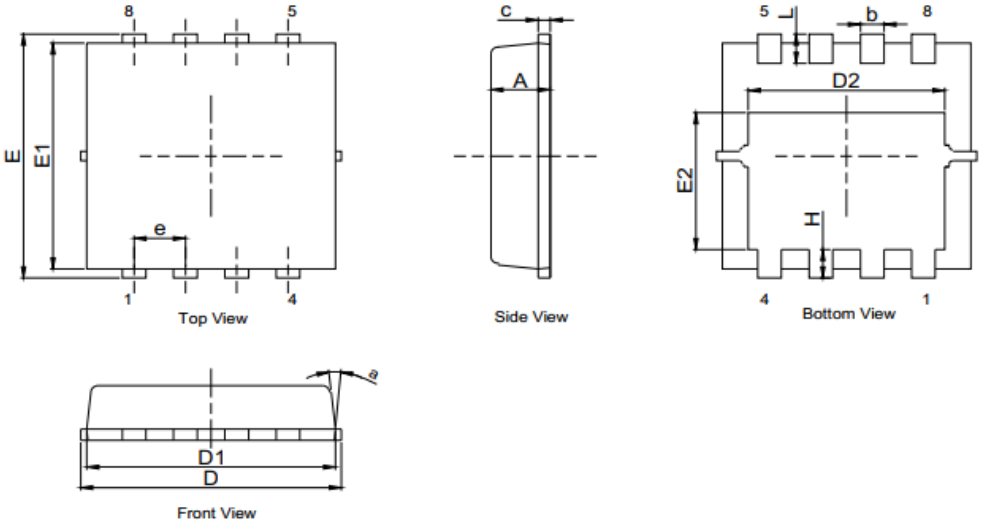


Figure 13. Max. Normalized Maximum Transient Thermal Impedance

- 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	0.70	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°

Notice

MOSPEC reserves the rights to make changes of the content herein the document anytime without notification. MOSPEC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies. Please refer to MOSPEC website for the last document.

MOSPEC disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially incurred.

Application shown on the herein document are examples of standard use and operation. Customers are responsible for comprehending suitable use in particular applications. MOSPEC makes no representation or warranty that such application will be suitable for the specified use without further testing or modification.

The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by MOSPEC for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of MOSPEC or others.

These MOSPEC products are intended for usage in general electronic equipment. Please make sure to consult with MOSPEC before you use these MOSPEC products in equipment which require specialized quality and/or reliability, and in equipment which could have major impact to the welfare of human life (atomic energy control, aeronautics , traffic control, combustion control, safety devices etc.)