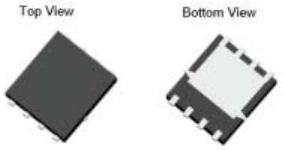
100V, 108A N-Channel Power MOSFET

DESCRIPTION：

- Ultra-Low $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS Tested, 100% Rg Tested
- Pb-Free Lead Plating
- RoHS compliant

V_{DS}	100V
I_D @V_{GS}=10V	108A
$R_{DS(ON)\_Typ.}$ @V_{GS}=10V	4.7mΩ



PDFN5x6-8L

TYPICAL APPLICATIONS：

- Power Management
- Current Switch
- Motor Driving in Power Tool, E-Vehicle

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

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	Tc=25℃ Tc=100℃	I_D	108 68	A
Pulsed Drain Current (1)		I_{DM}	388	A
Avalanche Current (2)		I_{AS}	47	A
Avalanche Energy (2)		E_{AS}	110	mJ
Power dissipation	Tc=25℃ Tc=100℃	P_D	130 52	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+150	℃

Notes： 1. Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature.
2. This single-pulse measurement was taken under the following condition [V_{DD}=50V, V_{GS}=10V, L=100uH] while its value is limited by T_{J_MAX}=150℃

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	65 0.96	℃/W

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	$V_{(BR)DSS}$	100			V
Zero Gate Voltage Drain Current VDS = 80 V, VGS = 0 V	I_{DSS}			1	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	1.9	2.5	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A VGS = 4.5V, ID = 15A	$R_{DS(on)}$		4.7 5.9	5.9 7.7	mΩ
Input capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{iss}		2604		pF
Output capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{oss}		567		pF
Reverse transfer capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{rss}		9.6		pF
Gate Resistance f=1MHz, VDS=0 V, VGS=0 V	R_g		1.8		Ω
Total Gate Charge VDS= 50V, ID= 20A, VGS= 10V VDS= 50V, ID= 20A, VGS= 4.5V	Q_G		42 28		nC
Gate to Source Charge VDS= 50V, ID= 20A, VGS= 0 to 10V	Q_{GS}		6.5		nC
Gate to Drain Charge VDS= 50V, ID= 20A, VGS= 0 to 10V	Q_{GD}		9.7		nC
Turn-on delay time VDS= 50V, VGS= 10V, R_L=2.5Ω, R_{GEN}=6Ω	td $_{(ON)}$		11.3		ns
Rise time VDS= 50V, VGS= 10V, R_L=2.5Ω, R_{GEN}=6Ω	tr		17.6		ns
Turn-off delay time VDS= 50V, VGS= 10V, R_L=2.5Ω, R_{GEN}=6Ω	td $_{(OFF)}$		46		ns
Fall time VDS= 50V, VGS= 10V, R_L=2.5Ω, R_{GEN}=6Ω	tf		36		ns

Body Diode

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

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Diode Forward Voltage VGS = 0V, I_S = 1A	V_{SD}		0.71	1.0	V
Maximum Continuous Body Diode Forward Current	I_S			130	A
Revers Recovery Time IF=15A, dI_F/dt = 100A/us	Trr		49		ns
Revers Recovery Charge IF=15A, dI_F/dt = 100A/us	Qrr		44		nC

Typical Performance Characteristics

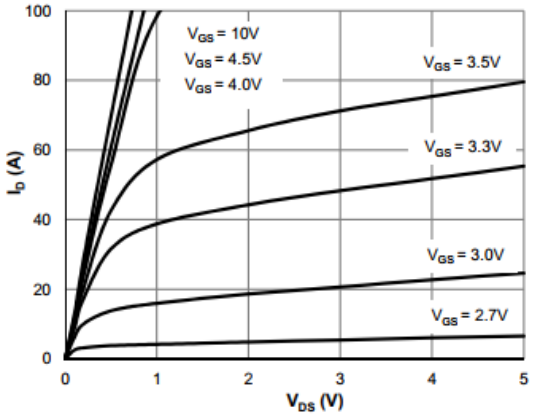


Figure 1. Saturation Characteristics

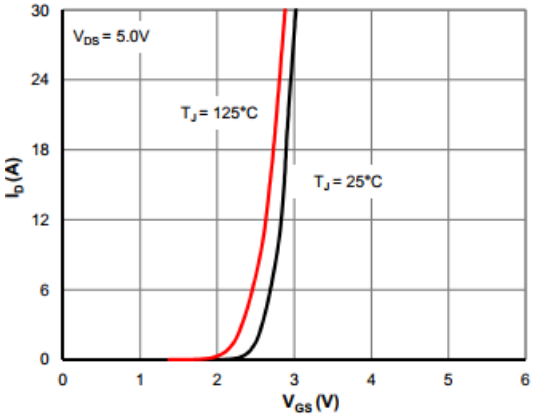


Figure 2. Transfer Characteristics

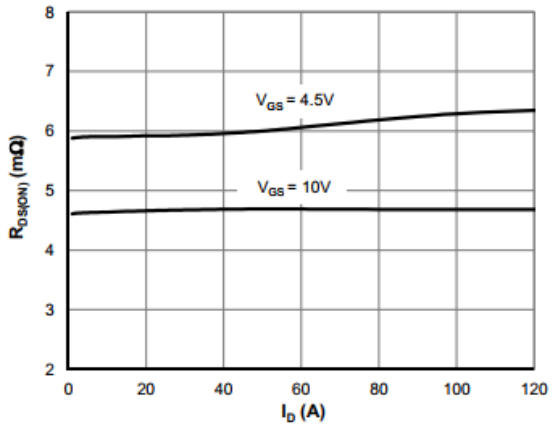


Figure 3. On-resistance vs. Drain Current

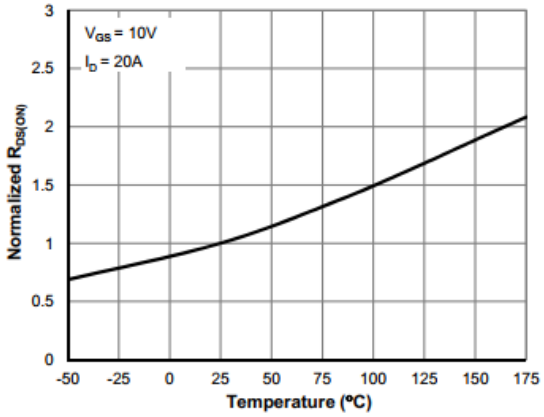


Figure 4. $R_{DS(ON)}$ vs. Junction Temperature

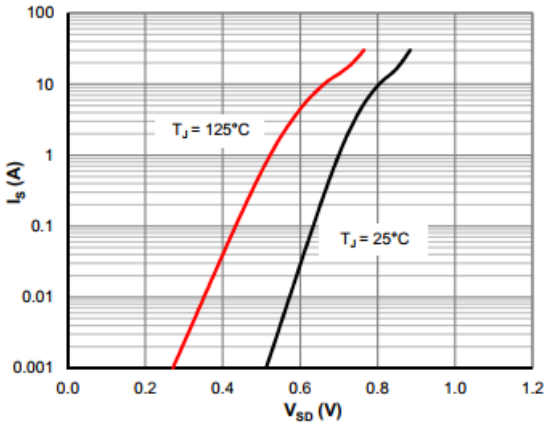


Figure 5. Body-Diode Characteristics

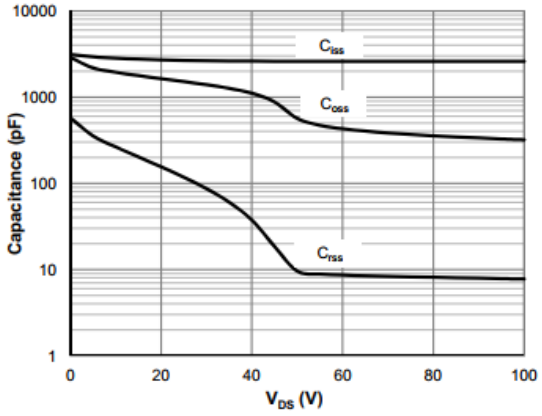


Figure 6. Capacitance Characteristics

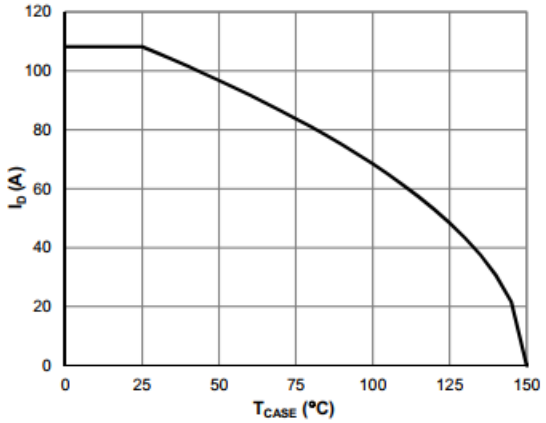


Figure 7. Current De-rating

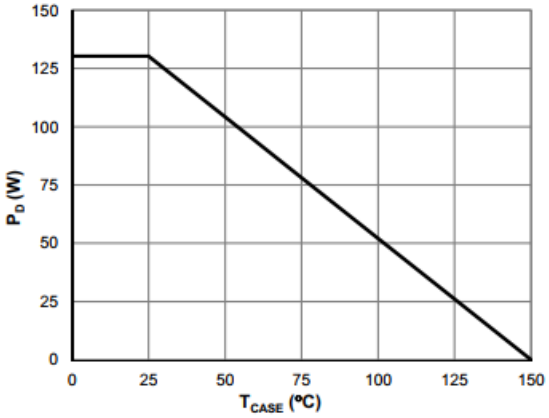


Figure 8. Power De-rating

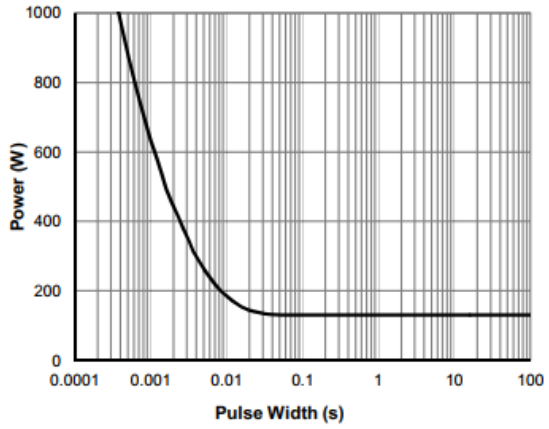


Figure 9. Single Pulse Power Rating, Junction-to-Case

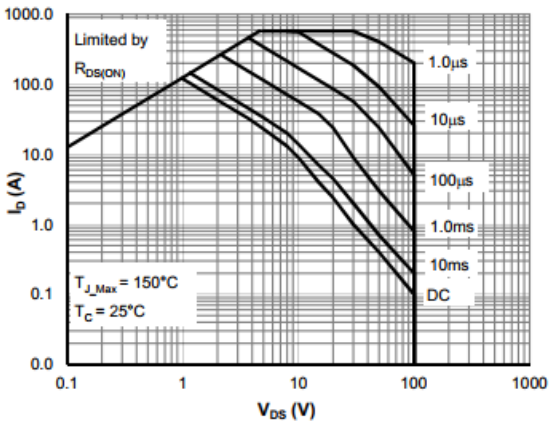


Figure 10. Maximum Safe Operating Area

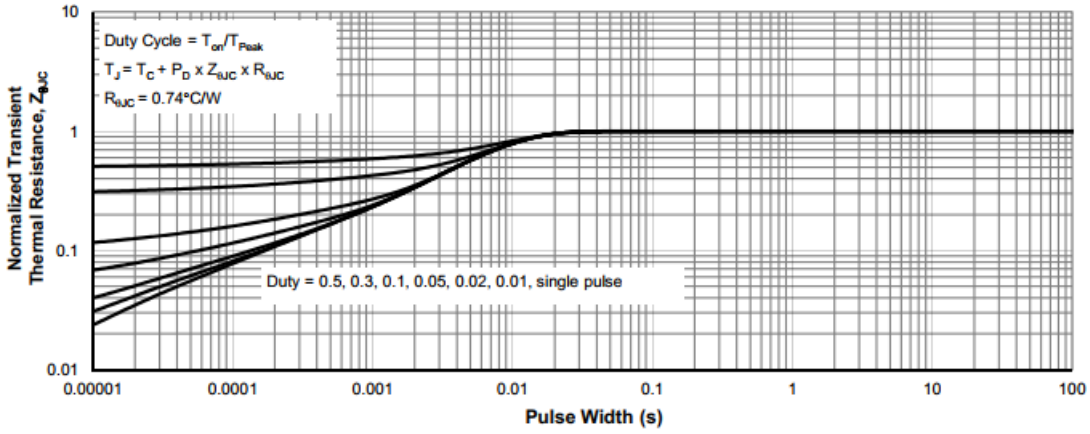
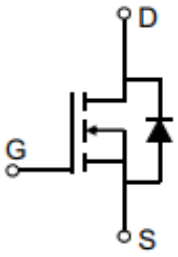
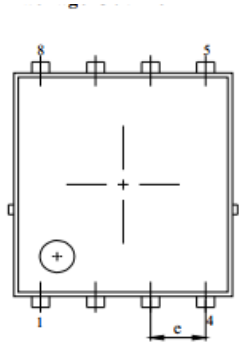


Figure 11. Normalized Maximum Transient Thermal Impedance

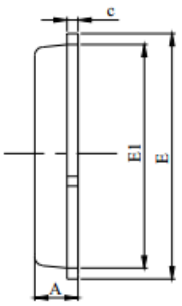
- Circuit diagram



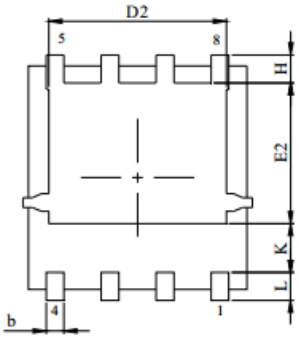
- Package outlines :



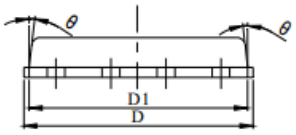
Top View



Side View



Bottom View



Front View

NOTES:
1. Dimension and tolerance per ASME Y14.5M, 1994.
2. All dimensions in millimeter (angle 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	0.31	0.41	0.51
c	0.20	0.25	0.30
D	5.00	5.20	5.40
D1	4.95	5.05	5.15
D2	4.00	4.10	4.20
E	6.05	6.15	6.25
E1	5.50	5.60	5.70
E2	3.42	3.53	3.63
e	1.27BSC		
H	0.60	0.70	0.80
L	0.50	0.70	0.80
K	1.23 REF		
θ	-	-	10°

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