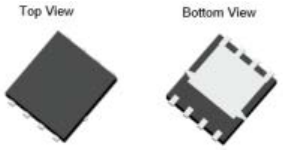
100V N-Channel Power MOSFET

DESCRIPTION：

- Ultra-Low On-Resistance, $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS Tested, 100% Rg Tested
- Pb-Free Lead Plating
- RoHS compliant
- AEC-Q101

V_{DS}	100V
I_D @V_{GS}=10V	138A
$R_{DS(ON)\_Typ.}$ @V_{GS}=10V	3.3mΩ



PDFN5x6-8L

TYPICAL APPLICATIONS：

- Power Management
- Load Switch
- PWM Application

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	138 98	A
Pulsed Drain Current (1)		I_{DM}	553	A
Avalanche Current (2)		I_{AS}	68	A
Avalanche Energy (2)		E_{AS}	231	mJ
Power dissipation	Tc=25℃ Tc=100℃	P_D	176 88	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+175	℃

Notes： 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. The single-pulse measurement was taken under the following condition [VDD=50V, VG=10V, L=100Uh] while Its value is limited by T_{JMAX} = 175℃

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction to Case	$R_{\theta JA}$ $R_{\theta JC}$	50 1.0	℃/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	$V_{GS(th)}$	2.0	2.7	4.0	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A	$R_{DS(on)}$		3.3	4.3	mΩ
Forward Transconductance VDS = 5V, ID = 20A	G_{FS}		3.3	4.3	S
Input capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{iss}		3434		pF
Output capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{oss}		906		pF
Reverse transfer capacitance f=1MHz, VDS=50 V, VGS=0 V	C_{rss}		14		pF
Gate Resistance VDS=0 V, VGS= 0V, f=1MHz	R_g		2.3		Ω
Total Gate Charge VDS= 50V, ID= 20A,VGS=10V / 6V	Q_G		57/38		nC
Gate to Source Charge VDS= 50V, ID= 20A,VGS= 0 to 10V	Q_{GS}		11		nC
Gate to Drain Charge VDS= 50V, ID= 20A,VGS= 0 to 10V	Q_{GD}		16.1		nC
Turn-on delay time VDS=50 V, VGS= 10V, R_L=2.5Ω, R_{GEN}=3Ω	$td_{(ON)}$		14.1		ns
Rise time VDS=50 V, VGS= 10V, R_L=2.5Ω, R_{GEN}=3Ω	tr		34		ns
Turn-off delay time VDS=50 V, VGS= 10V, R_L=2.5Ω, R_{GEN}=3Ω	$td_{(OFF)}$		60		ns
Fall time VDS=50 V, VGS= 10V, R_L=2.5Ω, R_{GEN}=3Ω	tf		50		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}		0.7	1.0	V
Diode Continuous Current, Tc=25℃	I_S			176	A
Revers Recovery Time IF=15A, dI_F/dt = 100A/us	Trr		59		ns
Revers Recovery Charge IF=15A, dI_F/dt = 100A/us	Qrr		62		nC

Typical Performance Characteristics

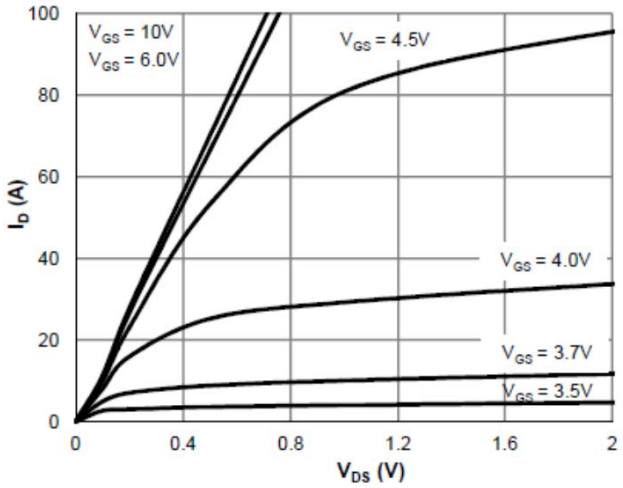


Figure 1. Output Characteristics

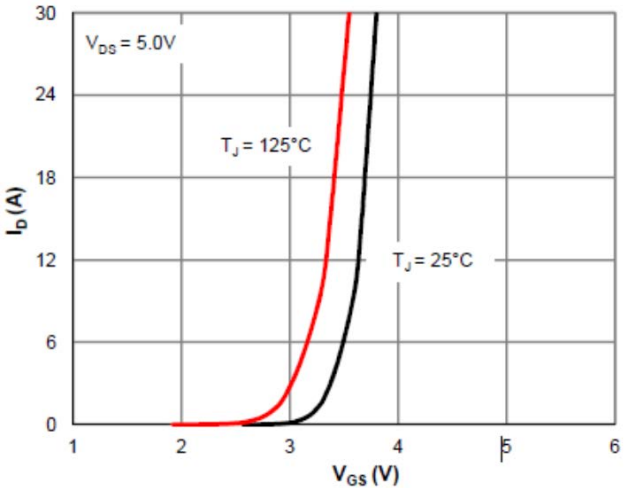


Figure 2. Typical Transfer Characteristics

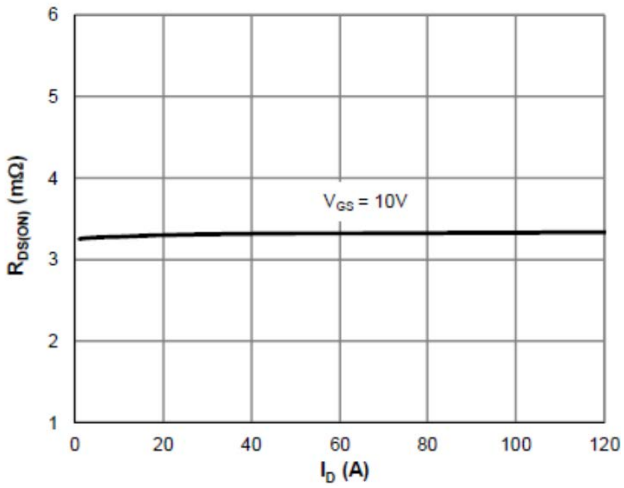


Figure 3. On-resistance vs. Drain Current

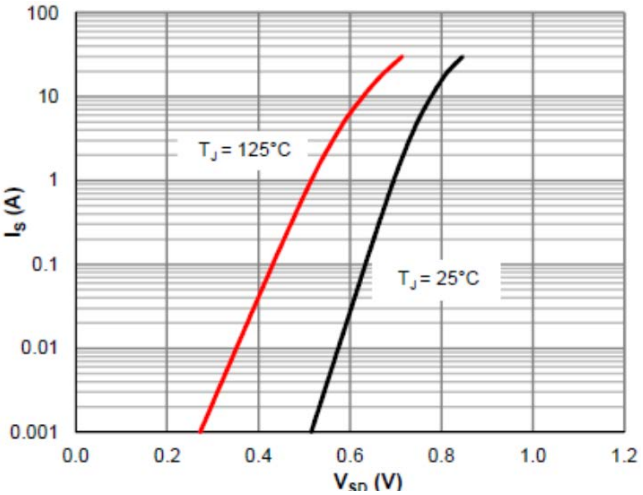


Figure 4. Body Diode Characteristics

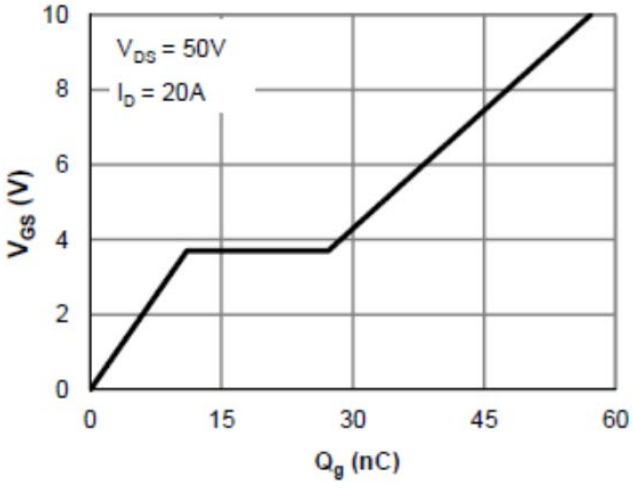


Figure 5. Gate Charge Characteristics

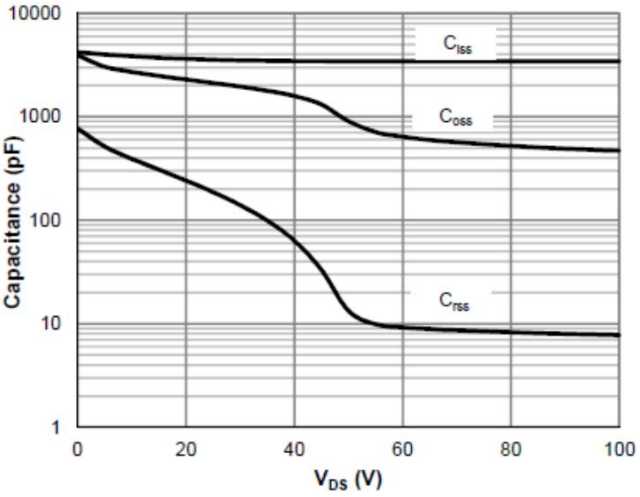


Figure 6. Capacitance Characteristics

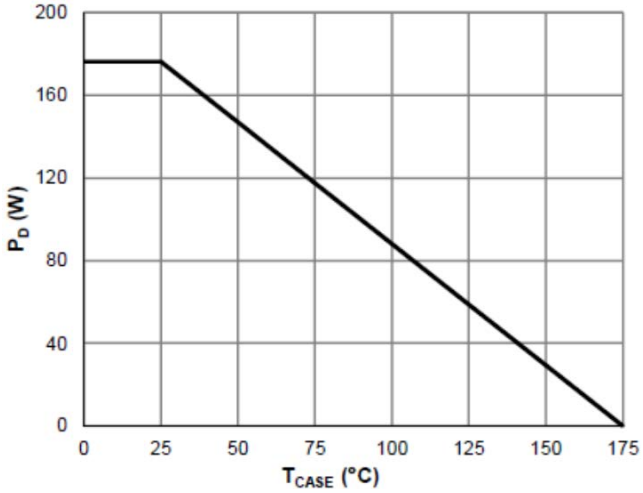


Figure 7.Power De-rating

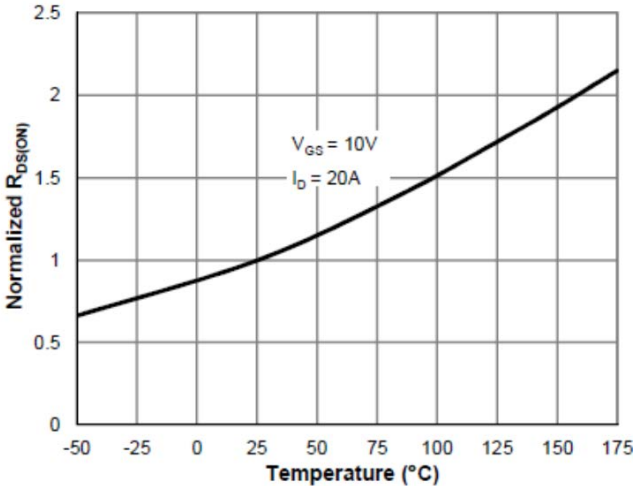


Figure 8. Normalized on Resistance vs. Junction Temperature

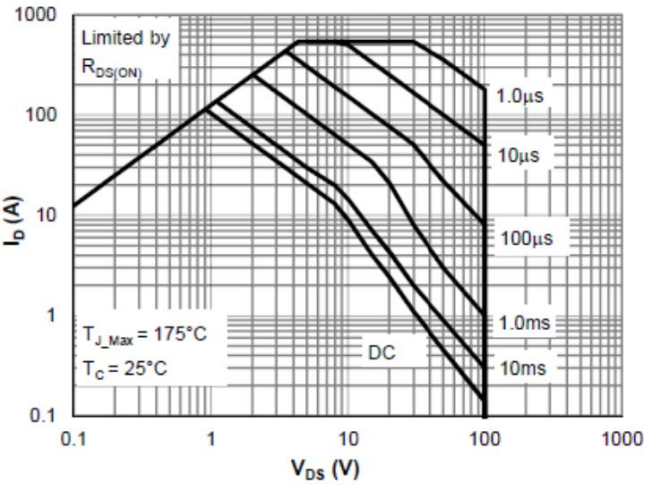


Figure 9. Maximum Safe Operating Area

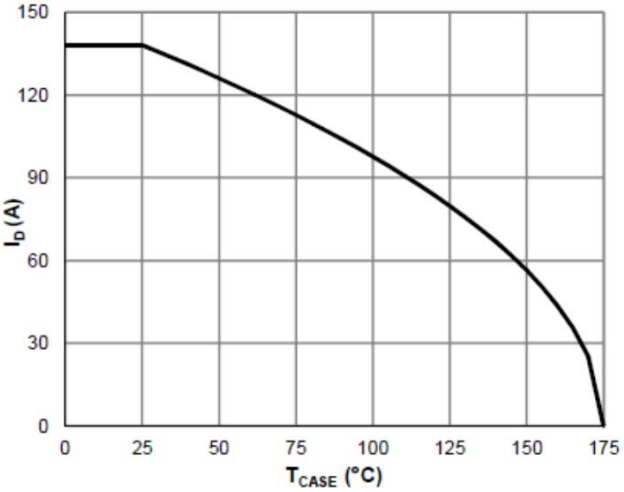


Figure 10. Maximum Continuous Drian Current vs. Case Temperature

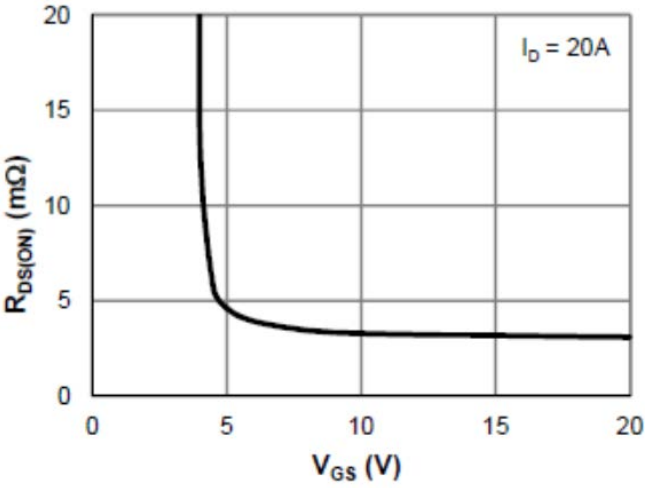


Figure 11. $R_{DS(ON)}$ vs. VGS

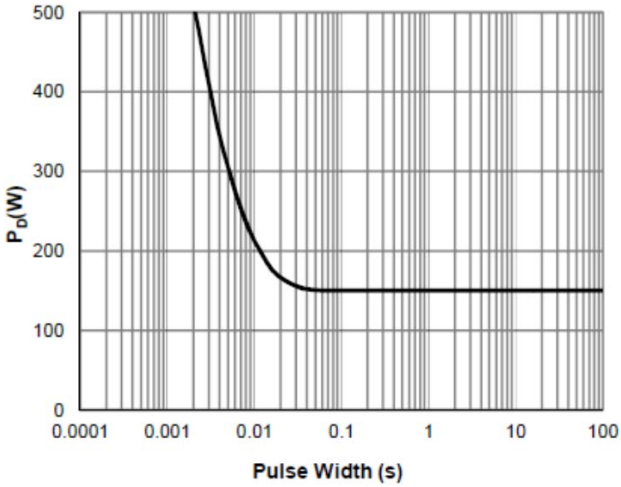


Figure 12. Single Pulse Power Rating, Junction to Case

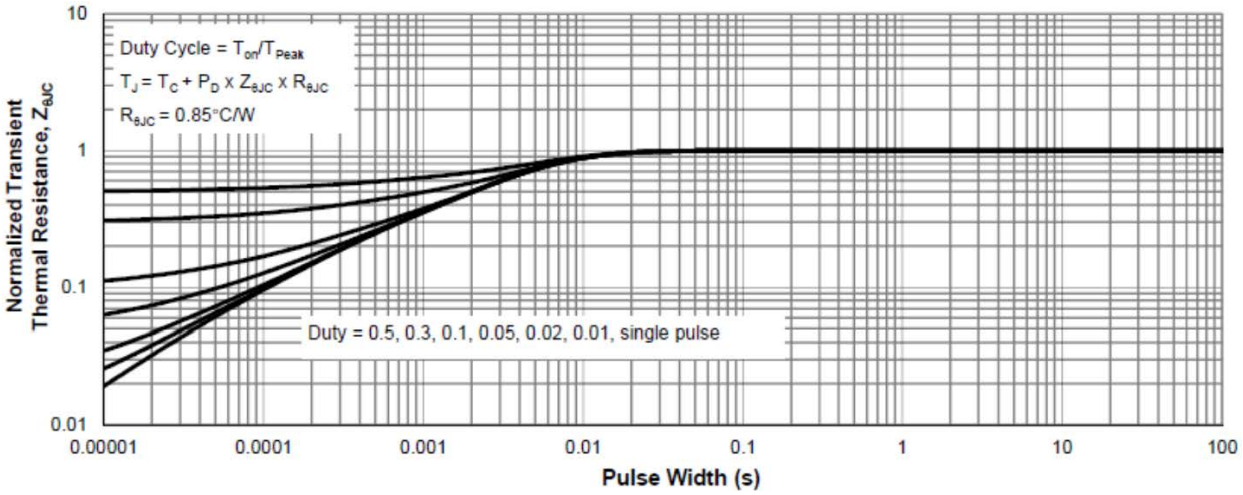
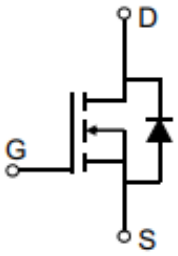
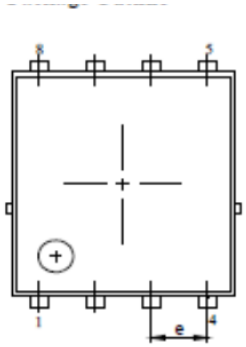


Figure 13. Normalized Maximum Transient Thermal Impedance

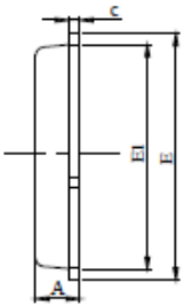
- Circuit diagram



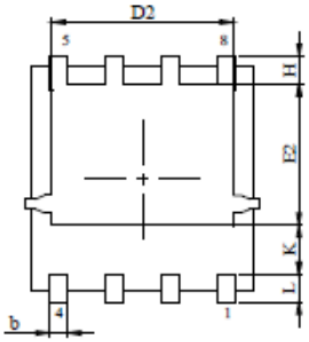
• Package outlines :



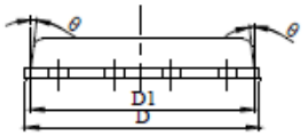
Top View



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
θ	-	-	10°

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