-30V P-Channel Power MOSFET

DESCRIPTION：

·Reliable and Rugged

·ROHS Compliant

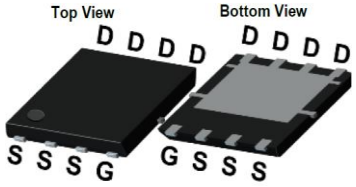
·100% UIS and Tested

V_{DS}	-30V
I_D	-59A
$R_{DS(ON)_MAX}$@V_{GS}=-10V	6.6mΩ

TYPICAL APPLICATIONS：

·Load Switches

·BLDC Motor



PDFN3x3-8L

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

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	-30	V
Gate-Source Voltage		V_{GSS}	±25	V
Diode Continuous Forward Current	T_C = 25℃	I_S	-12.5	A
Pulse Drain Current Tested(1)	T_C = 25℃	I_{DM}	-148	A
Continuous Drain Current	T_C = 25℃ T_C = 100℃	I_D	-59 -37.5	A
Continuous Drain Current	T_C = 25℃ T_C = 100℃	P_D	35.7 14.3	W
Continuous Drain Current	T_A = 25℃ T_A = 100℃	I_D	-12.8 -10.2	A
Maximum Power Dissipation	T_A = 25℃ T_A = 100℃	P_D	1.7 1.1	W
Avalanche Current, Single pulse(2)	L=0.1mH L=0.5mH	I_{AS}	-33 -20	A
Avalanche Energy, Single pulse(2)	L=0.1mH L=0.5mH	E_{AS}	54 100	mJ
Maximum Junction Temperature		T_J	150	℃
Storage temperature Range		T_{STG}	-55~+150	℃
Thermal Resistance	Junction to Case	$R_{\theta JC}$	3.5	℃/W
Thermal Resistance	Junction to Ambient	$R_{\theta JA}$	75	℃/W

Notes： 1. Max. current is limited by Junction temperature.
2. UIS tested and pulse width are limited by maximum junction temperature 150°C

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 = -24 V, VGS = 0 V	I_{DSS}			-1	uA
Gate-Source Leakage Current VGS = ±25V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = -250uA	$V_{GS(th)}$	-1	-1.6	-2.5	V
Drain-Source On-State Resistance VGS = -10V, ID = -20A VGS = -4.5V, ID = -10A	$R_{DS(on)}$		5.5 8.3	6.6 11	mΩ
Forward Transconductance VDS=-5V, IDS=-10A	gfs		20.8		S
Gate Resistance VGS=0V,VDS=0V,Freq.=1MHz	R_G		16.6		Ω
Input capacitance f=1MHz, VDS=-15 V, VGS=0 V	C_{iss}		4354		pF
Output capacitance f=1MHz, VDS=-15 V, VGS=0 V	C_{oss}		430		pF
Reverse transfer capacitance f=1MHz, VDS=-15 V, VGS=0 V	C_{rss}		282		pF
Turn-on delay time VDD= -15V, VGS= -10V, ID=-1A, R_{GEN}=1Ω	$td_{(ON)}$		13.4		ns
Rise time VDD= -15V, VGS= -10V, ID=-1A, R_{GEN}=1Ω	tr		12.4		ns
Turn-off delay time VDD= -15V, VGS= -10V, ID=-1A, R_{GEN}=1Ω	$td_{(OFF)}$		262		ns
Fall time VDD= -15V, VGS= -10V, ID=-1A, R_{GEN}=1Ω	tf		183		ns
Total Gate Charge VDS =-15V, ID =-20A, VGS =-4.5V VDS =-24V, ID =-20A, VGS =-10V	Qg		32.8 67.4		nC
Gate-Source Charge VDS =-24V, ID =-20A, VGS =-10V	Qg_S		13.4		nC
Gate-Drain("Miller") Charge VDS =-24V, ID =-20A, VGS =-10V	Qg_d		11.9		nC
Drain to Source Diode Forward Voltage VGS = 0V, IS =-10A	V_{SD}		-0.8	-1.1	V
Reverse Recovery Time I_F=-10A, VR=-15V ,di/dt=-100A/μs	Trr		17.6		nS
Reverse Recovery Charge I_F=-10A, VR=-15V ,di/dt=-100A/μs	Qrr		8.3		nC

Typical Performance Characteristics

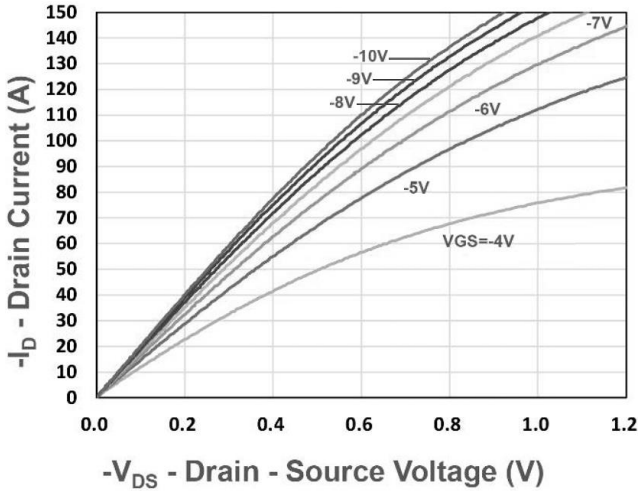


Figure 1. Output Characteristics

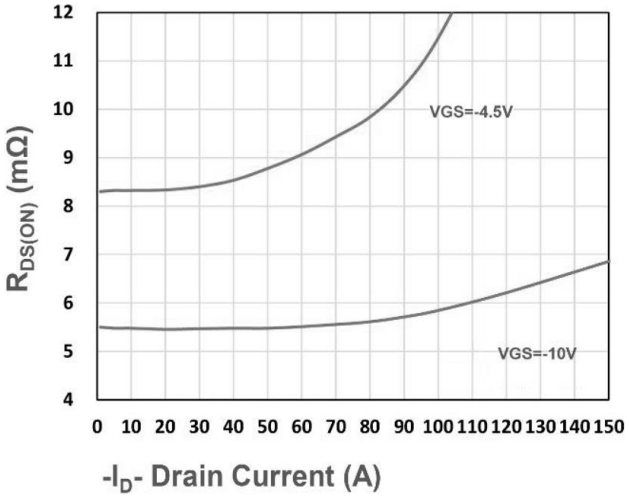


Figure 2. On-Resistance vs. ID

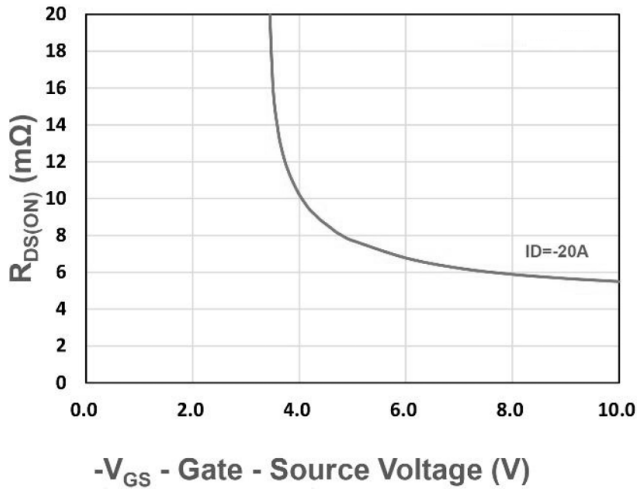


Figure 3. On-Resistance vs. VGS

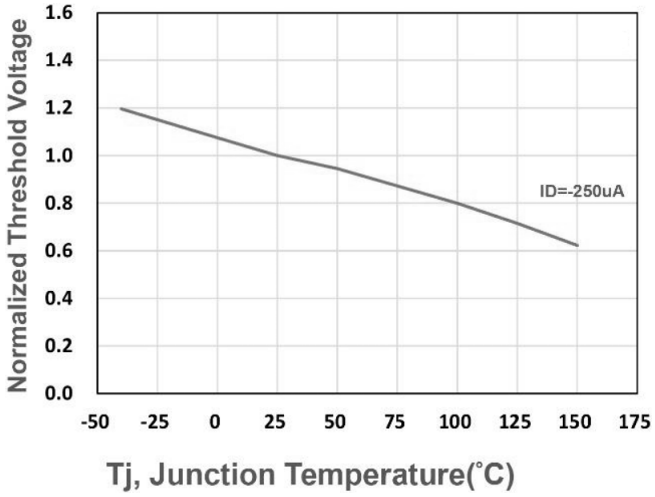


Figure 4. Gate Threshold Voltage

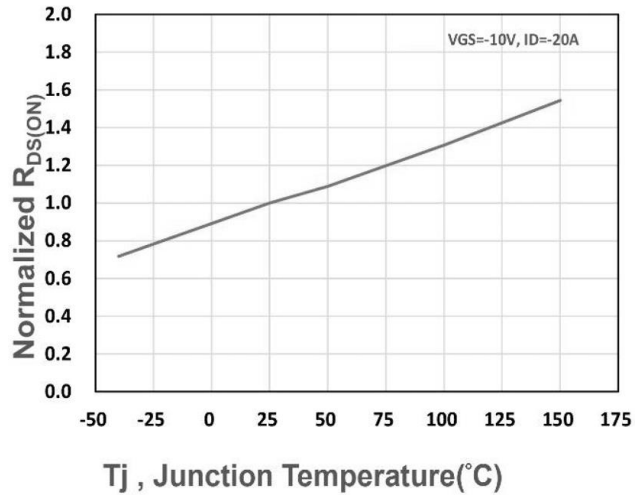


Figure 5. Drain-Source On Resistance

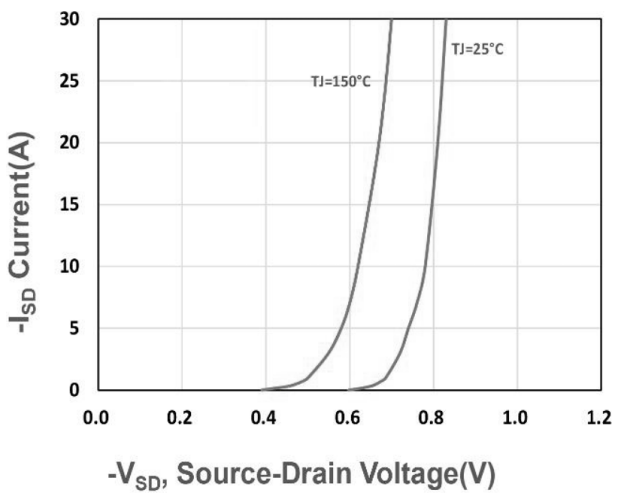


Figure 6. Source-Drain Diode Forward

Typical Performance Characteristics

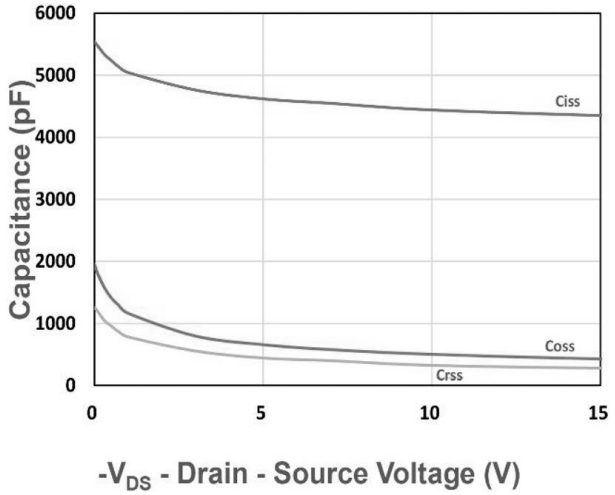


Figure 7. Capacitance

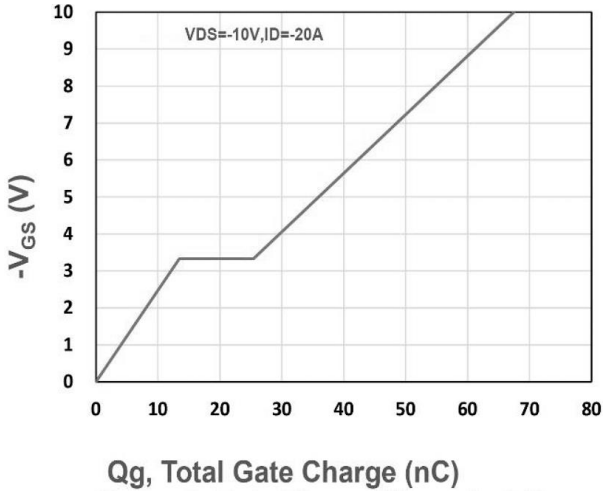


Figure 8. Gate Charge Characteristics

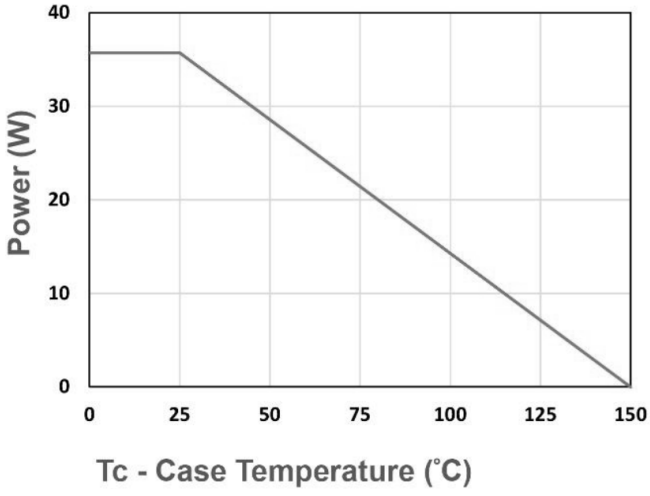


Figure 9. Power Dissipation

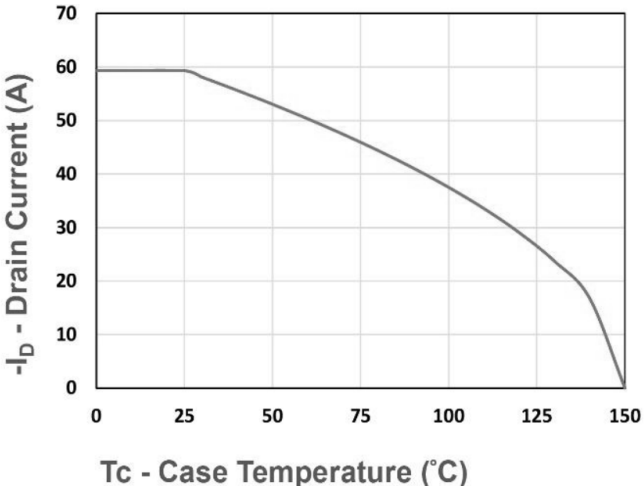


Figure 10. Drain Current

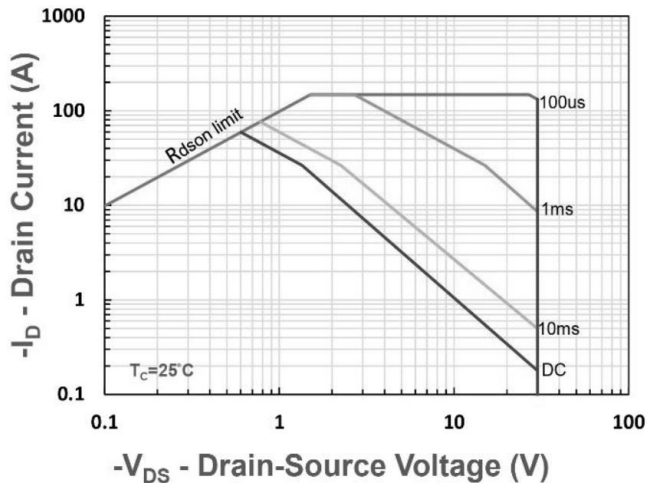


Figure 11. Safe Operating Area

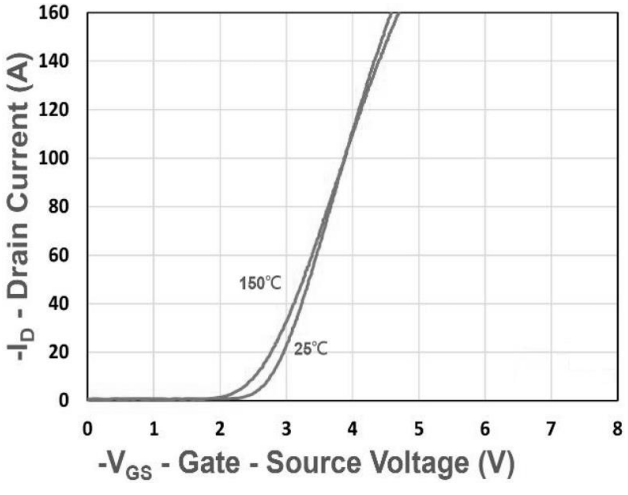


Figure 12. Transfer Characteristics

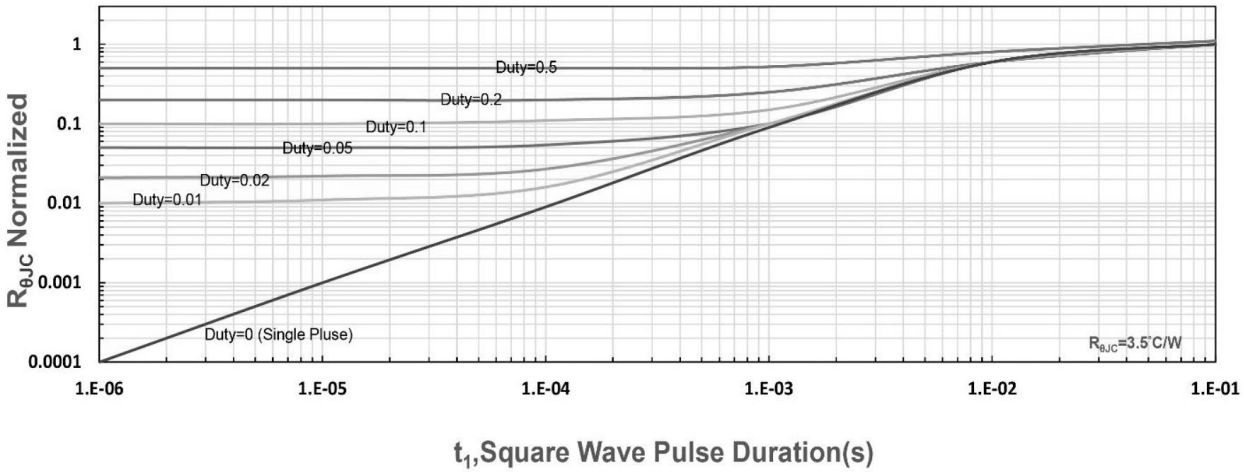
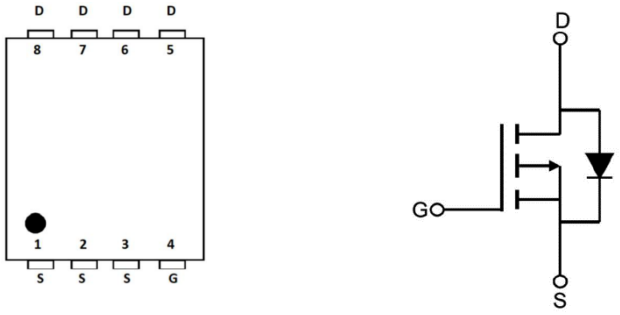
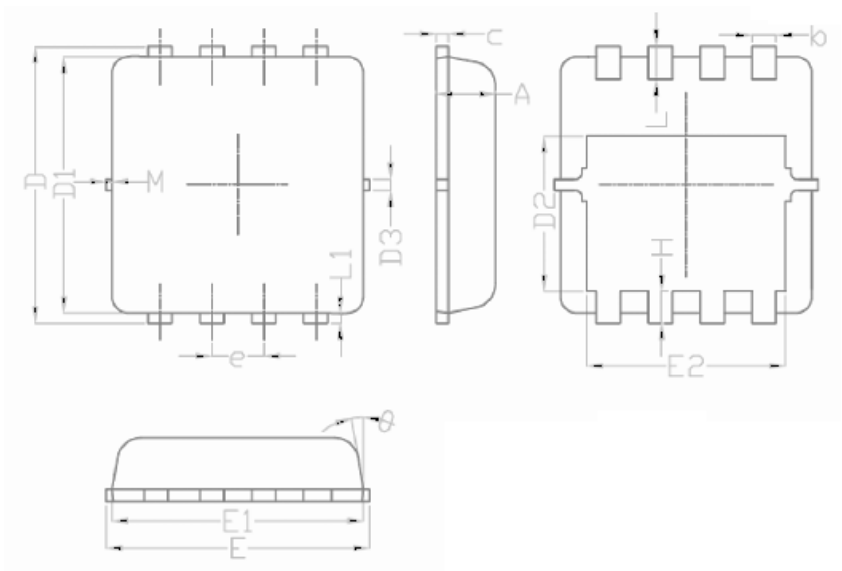


Figure 13. $R_{\theta JC}$ Transient Thermal Impedance

·Circuit diagram



·Package outlines : Dimensions in (mm)



Unit:mm	Min	Typ	Max
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	/	0.13	/
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65 BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	/	0.13	/
θ	/	10°	12°
M	/	/	0.15

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