30V N-Channel Trench MOSFET

V_{DS}	30V
I_D	160A
$R_{DS(ON)_MAX}$ @V_{GS}=10V	1.8mΩ

DESCRIPTION：

·Trench Power technology

·Low RDS(ON)

·Low Gate Charge

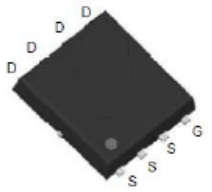
·High Current Capability

·100% UIS Tested

TYPICAL APPLICATIONS：

·Synchronous Rectification in DC/DC and AC/DC Converters

·Isolated DC/DC Converters in Telecom and Industrial



DFN5X6-8L

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(1)	Tc=25℃ Tc=100℃	I_D	160 110	A
Pulsed Drain Current (2)		I_{DM}	480	A
Avalanche Current(3)		I_{AS}	56	A
Avalanche Energy(3)	L =0.3mH	E_{AS}	470	mJ
Power dissipation	Tc=25℃ Tc=100℃	P_D	136 68	W
Junction & Storage temperature Range		T_J, T_{STG}	-55~+175	℃

Notes:1. Single pulse width limited by maximum junction temperature.

2. The power dissipation PD is based on TJ(MAX) =175ºC, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction to Ambient Junction-to-Case	$R_{\theta JA}$ $R_{\theta JC}$	50 1.1	℃/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	$V_{(BR)DSS}$	30			V
Zero Gate Voltage Drain Current VDS = 30 V, VGS = 0 V, T_J=25℃ VDS = 30 V, VGS = 0 V, T_J=125℃	I_{DSS}			1.0 100	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	1.0	1.6	2.4	V
Drain-Source On-State Resistance VGS = 10V, ID = 30A VGS = 4.5V, ID = 30A	$R_{DS(on)}$		1.3 2.0	1.8 2.5	mΩ
Diode Forward Voltage IS = 30A, VGS = 0V	V_{SD}			1.0	V
Forward Transconductance VDS =10V, ID =20A	g_{FS}		61		S
Diode Continuous Current	I_S			51	A
Input capacitance f=1MHz, VDS=15 V, VGS=0 V	C_{iss}		8826		pF
Output capacitance f=1MHz, VDS=15 V, VGS=0 V	C_{oss}		1320		pF
Reverse transfer capacitance f=1MHz, VDS=15 V, VGS=0 V	C_{rss}		1386		pF
Gate Resistance VGS = 0V, VDS= 0V, f = 1MHz	R_G		1.7		Ω
Total Gate Charge VDS= 15V, ID= 50A, VGS= 10V	Q_G		177		nC
Gate to Source Charge VDS= 15V, ID= 50A, VGS= 0 to 10V	Q_{GS}		29		nC
Gate to Drain Charge VDS= 15V, ID= 50A, VGS= 0 to 10V	Q_{GD}		35		nC
Turn-on delay time VDS= 15V, VGS= 10V, ID= 50A, R_{GEN}=3Ω	td (ON)		30		ns
Rise time VDS= 15V, VGS= 10V, ID= 50A, R_{GEN}=3Ω	tr		29		ns
Turn-off delay time VDS= 15V, VGS= 10V, ID= 50A, R_{GEN}=3Ω	td (OFF)		101		ns
Fall time VDS= 15V, VGS= 10V, ID= 50A, R_{GEN}=3Ω	tf		48		ns
Revers Recovery Time IF=30A, di/dt = 100A/us	Trr		47		ns
Revers Recovery Charge IF=30A, di/dt = 100A/us	Qrr		43		nC

Typical Performance Characteristics

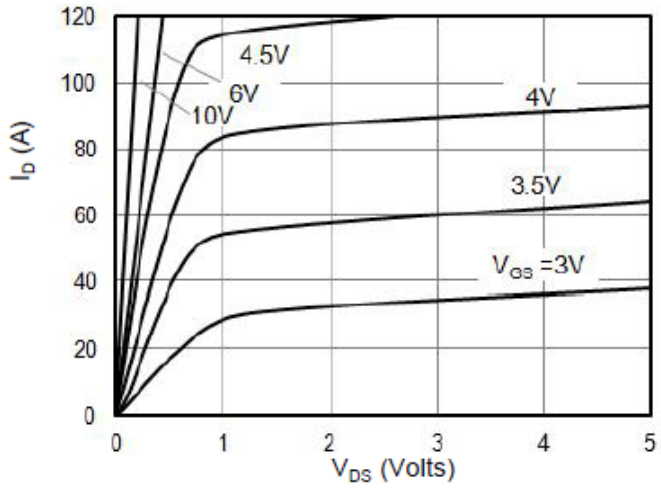


Figure 1. On-Region Characteristics

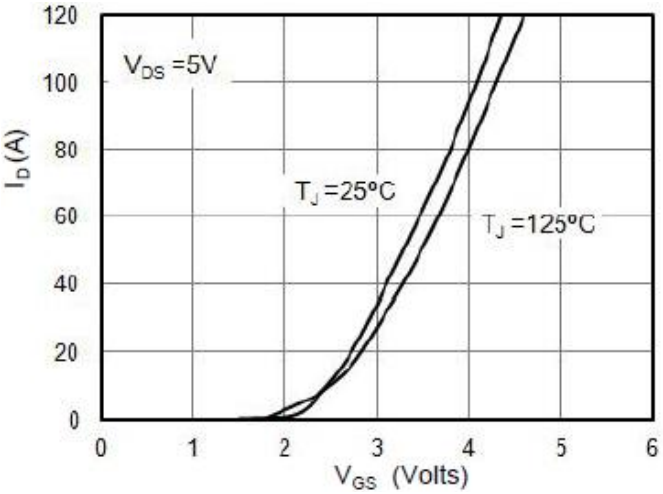


Figure 2. Transfer Characteristics

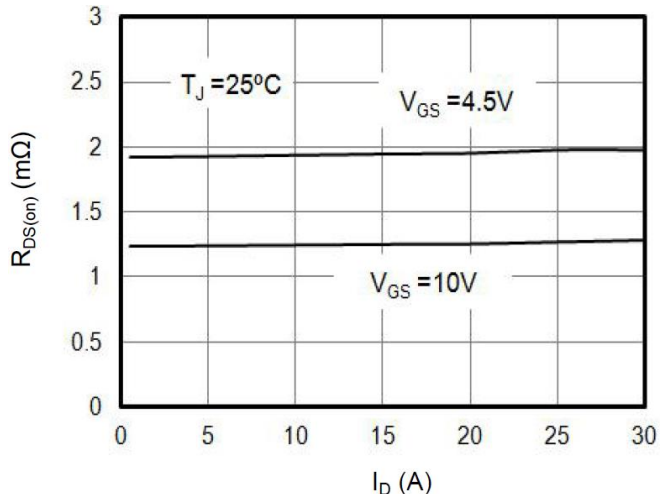


Figure 3. On-Resistance vs. Drain Current

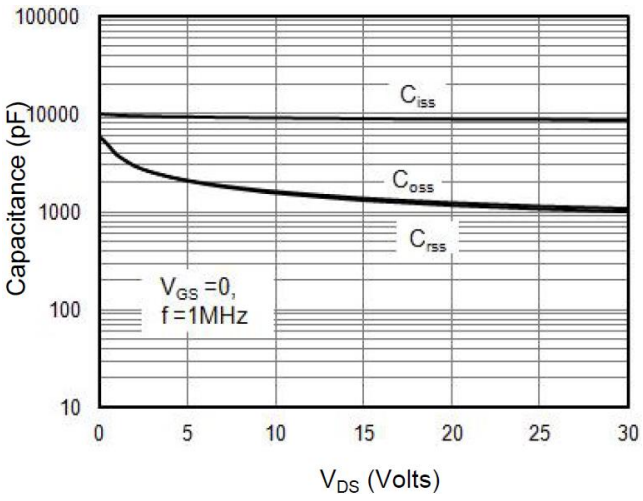


Figure 4. Capacitance Characteristics

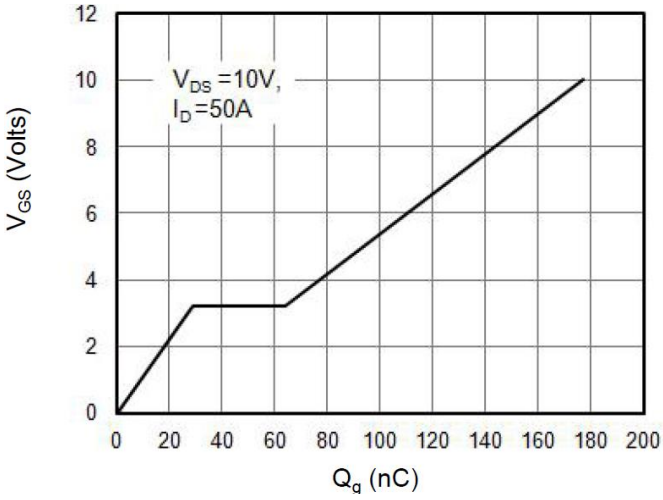


Figure 5. Gate Charge Characteristics

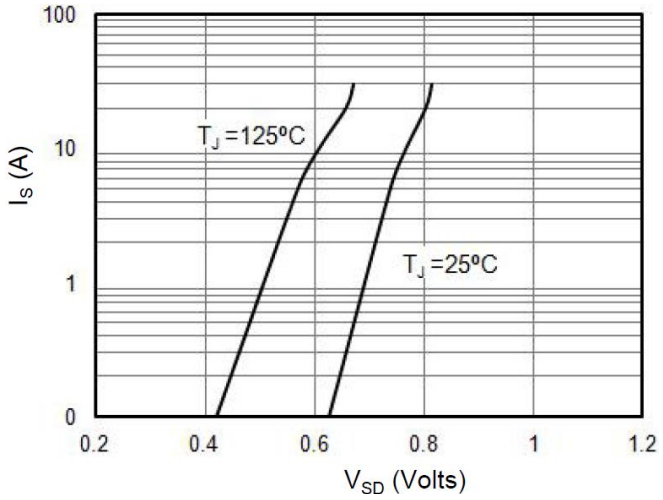


Figure 6. Body Diode Forward Voltage

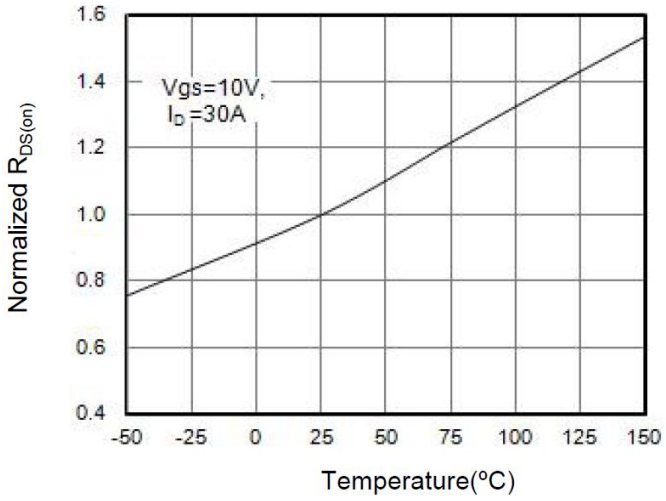


Figure 7. On-Resistance vs. Junction Temperature

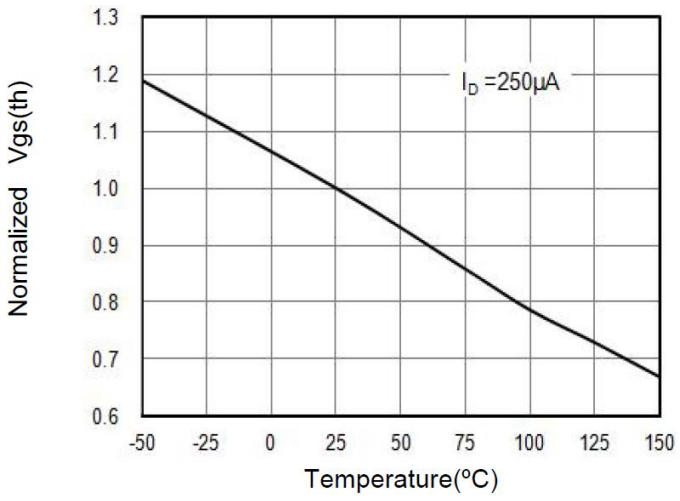


Figure 8. Vgs(th) vs. Junction Temperature

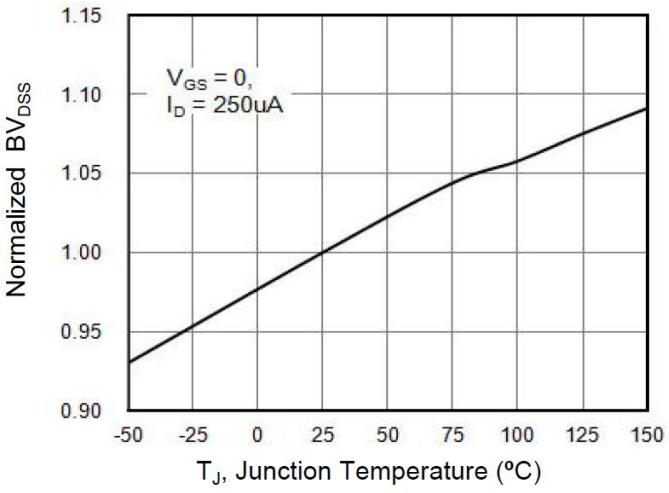


Figure 9. B_{VDSS} vs. Junction Temperature

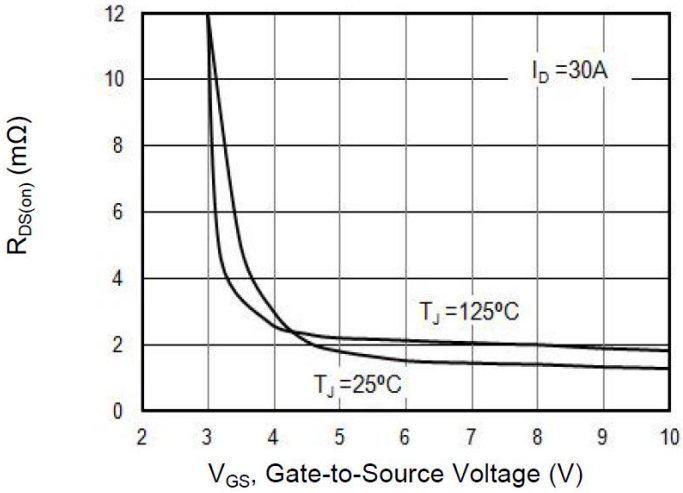


Figure10. On-Resistance vs. Gate-Source Voltage

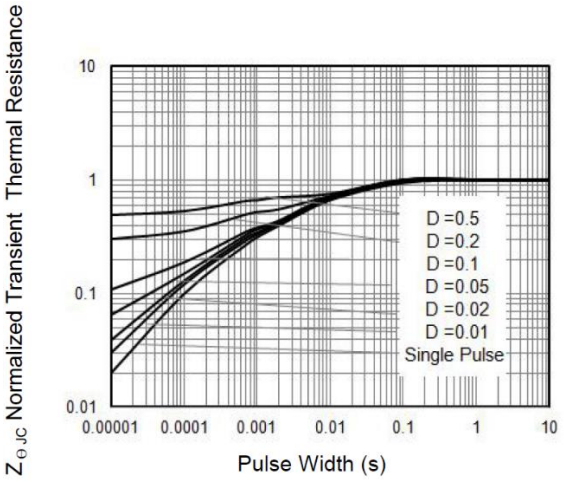


Figure 11. Normalized Transient Thermal Resistance

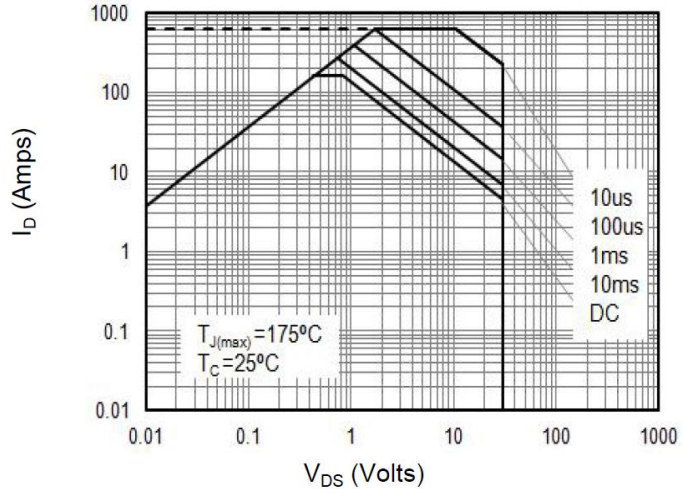
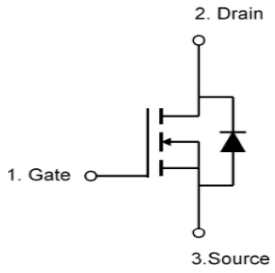
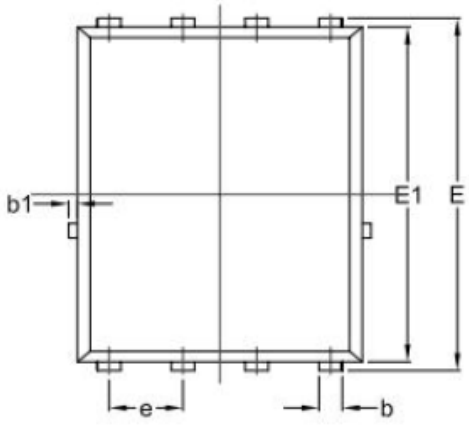


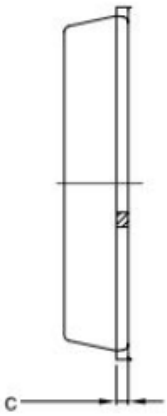
Figure 12. Safe Operating Area

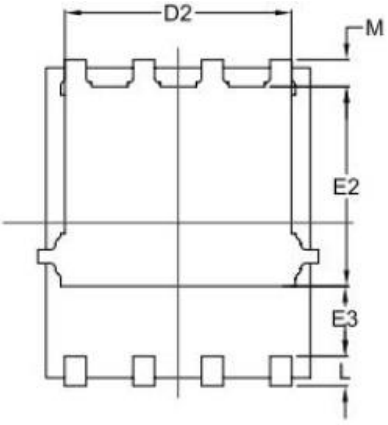
·Circuit diagram

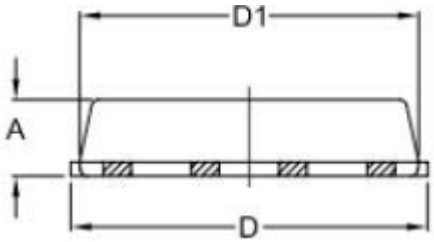


·Package outlines : Dimensions in (mm)









DIM	MILLIMETERS		
	MIN	NOM	MAX
A	1.00	1.10	1.20
b	0.30	0.40	0.50
b1	0.02	0.15	0.22
c	0.15	0.20	0.35
D	4.95	5.15	5.35
D1	4.80	4.90	5.00
D2	4.00	4.20	4.40
E	5.95	6.05	6.25
E1	5.65	5.75	5.85
E2	3.50	3.70	3.90
E3	1.10	/	/
e		1.27	
L	0.40	0.55	0.70
M	0.35	0.50	0.65

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