

P-Ch 18V Fast Switching MOSFETs

- ★ Super Low Gate Charge
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

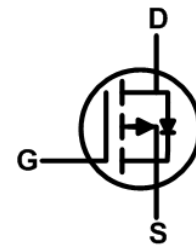
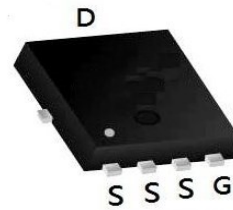

Product Summary

BVDSS	R _{DS(on)}	ID
-18V	2.4mΩ	-85A

Description

The XXW20P80F is the high cell density trenched P-ch MOSFETs, which provides excellent R_{DS(on)} and efficiency for most of the small power switching and load switch applications.

The XXW20P80F meet the RoHS and Green Product requirement with full function reliability approved.

PDFN 5x6 Pin Configuration

Absolute Maximum Ratings T_c=25°C unless otherwise noted

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-18	V
V _{GS}	Gate-Source Voltage	±12	V
I _D	Drain Current – Continuous (T _c =25°C)	-85	A
	Drain Current – Continuous (T _c =100°C)	-54	A
I _{DM}	Drain Current – Pulsed ¹	-360	A
P _D	Power Dissipation (T _c =25°C)	41.67	W
	Power Dissipation – Derate above 25°C	0.33	W/°C
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction to ambient	---	62	°C/W
R _{θJC}	Thermal Resistance Junction to Case	---	3	°C/W

Electrical Characteristics ($T_J=25\text{ }^\circ\text{C}$, unless otherwise noted)
Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-18	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=-1\text{mA}$	---	-0.008	---	$V/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-20V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	μA
		$V_{DS}=-16V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	-30	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	± 500	nA

On Characteristics

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-4.5V, I_D=-20A$	---	2.4	3.2	m Ω
		$V_{GS}=-2.5V, I_D=-20A$	---	3.3	4.5	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-0.4	-0.6	-1.0	V
ΔV_{GS}	$V_{GS(th)}$ Temperature Coefficient		---	-3.44	---	$\text{mV}/^\circ\text{C}$
gfs	Forward Transconductance	$V_{DS}=-10V, I_S=-3A$	---	30	---	S

Dynamic and switching Characteristics

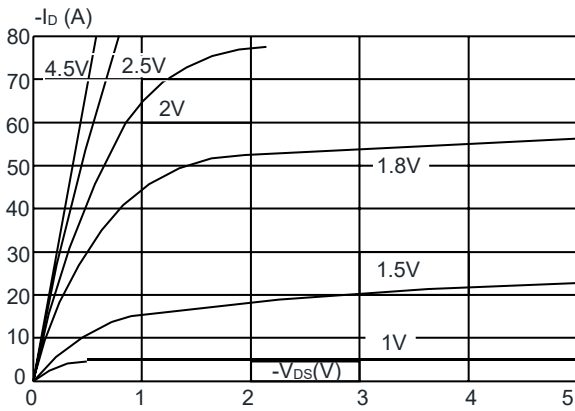
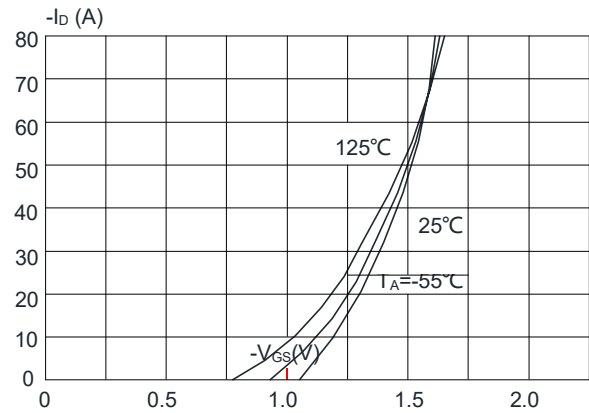
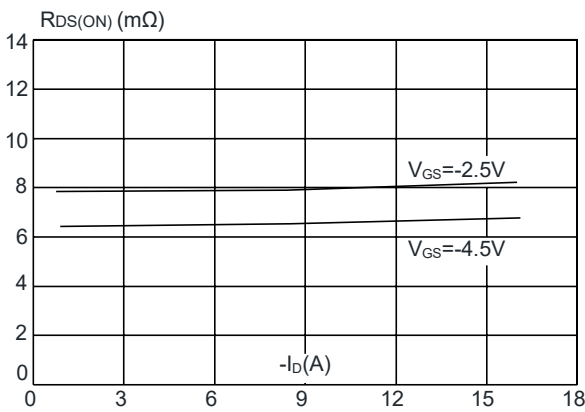
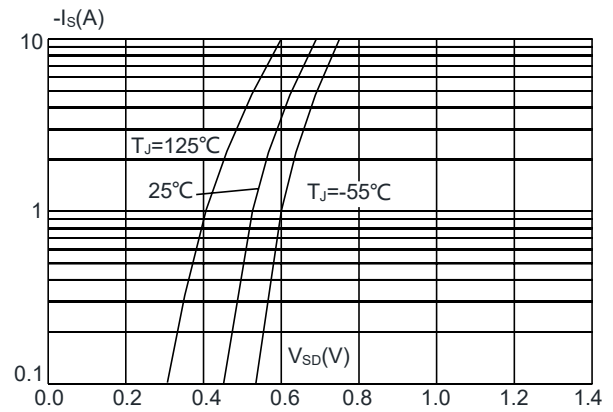
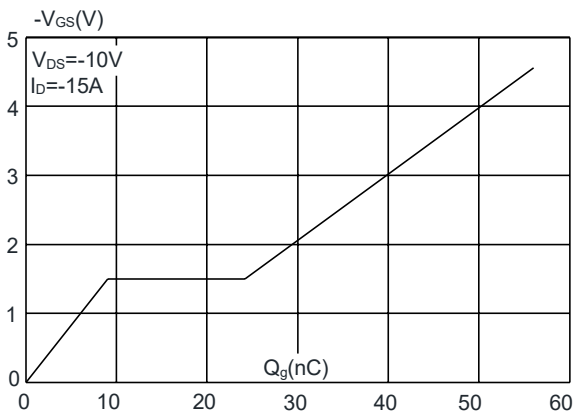
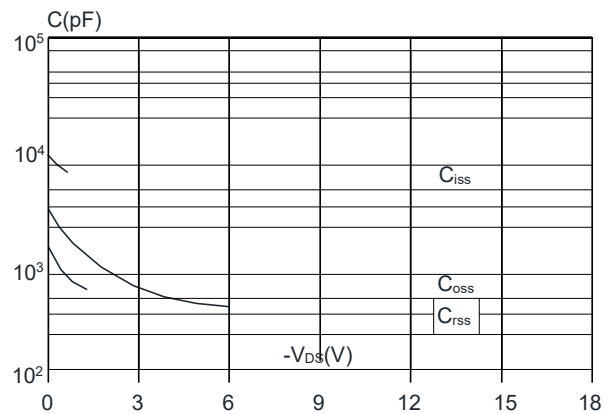
Q_g	Total Gate Charge ^{2,3}	$V_{DS}=-16V, V_{GS}=-4.5V, I_D=-5A$	---	149	nC
Q_{gs}	Gate-Source Charge ^{2,3}		---	14.4	
Q_{gd}	Gate-Drain Charge ^{2,3}		---	42.8	
$T_{d(on)}$	Turn-On Delay Time ^{2,3}	$V_{DD}=-15V, V_{GS}=-4.5V, R_G=25\Omega, I_D=-1A$	---	21.2	nS
T_r	Rise Time ^{2,3}		---	20.6	
$T_{d(off)}$	Turn-Off Delay Time ^{2,3}		---	26	
T_f	Fall Time ^{2,3}		---	400	
C_{iss}	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, F=1\text{MHz}$	---	10698	pF
C_{oss}	Output Capacitance		---	2347	
C_{rss}	Reverse Transfer Capacitance		---	1267	
R_g	Gate resistance	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	---	2.6	Ω

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	-85	A
I_{SM}	Pulsed Source Current		---	---	-190	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

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


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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

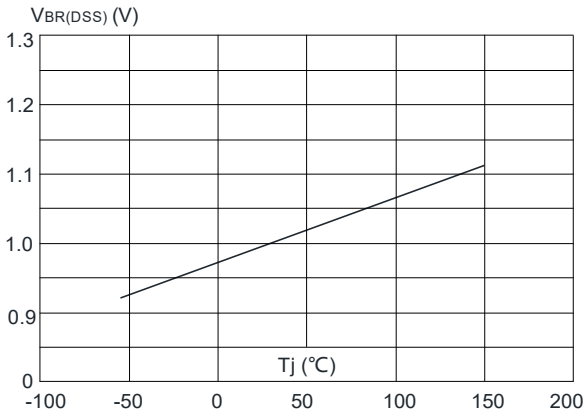


Figure 8: Normalized on Resistance vs. Junction Temperature

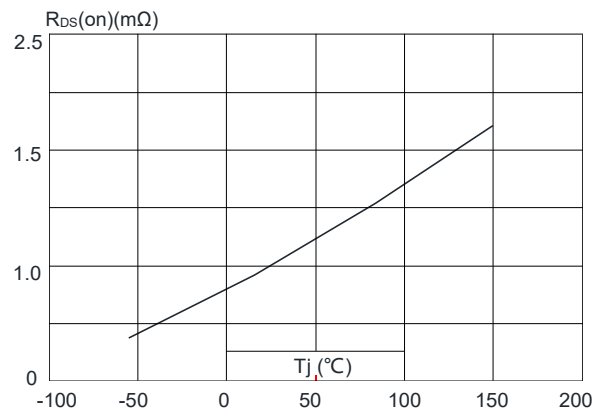


Figure 9: Maximum Safe Operating Area

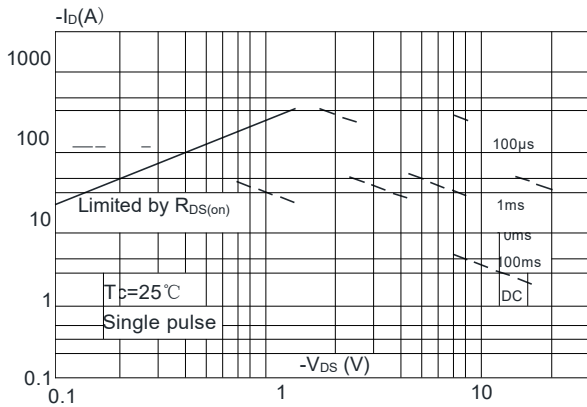


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

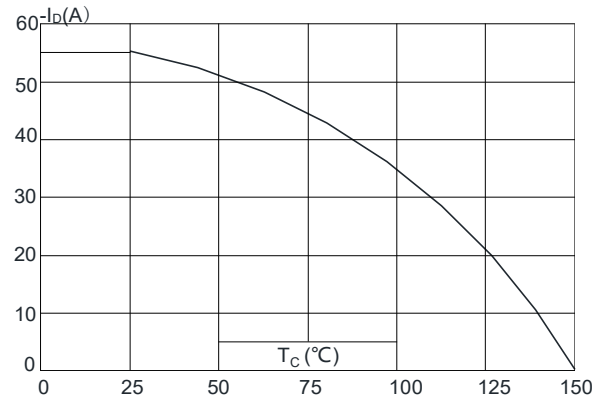
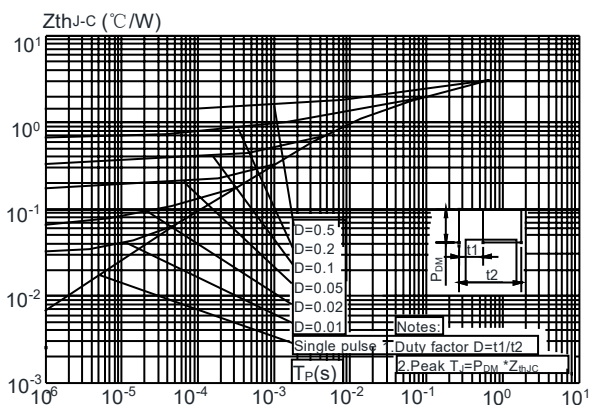
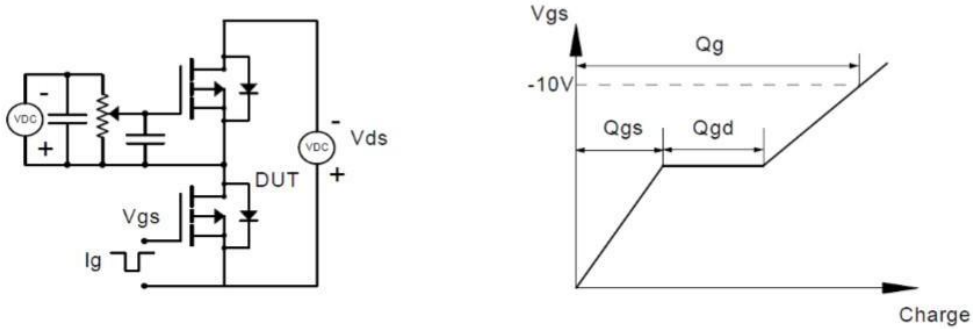


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

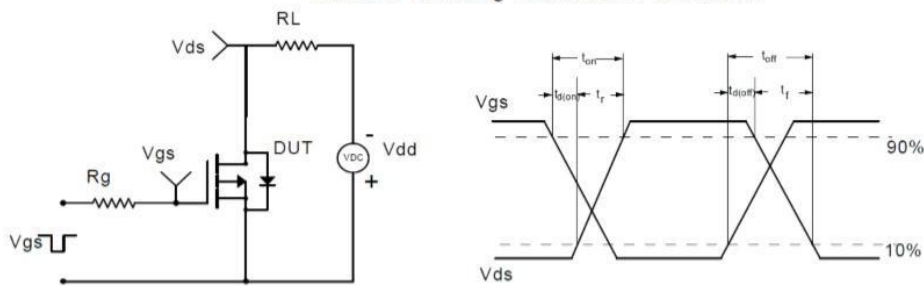


Test Circuit

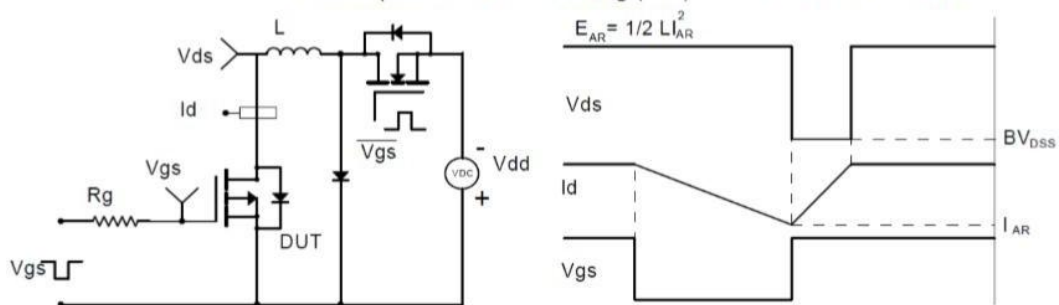
Gate Charge Test Circuit & Waveform



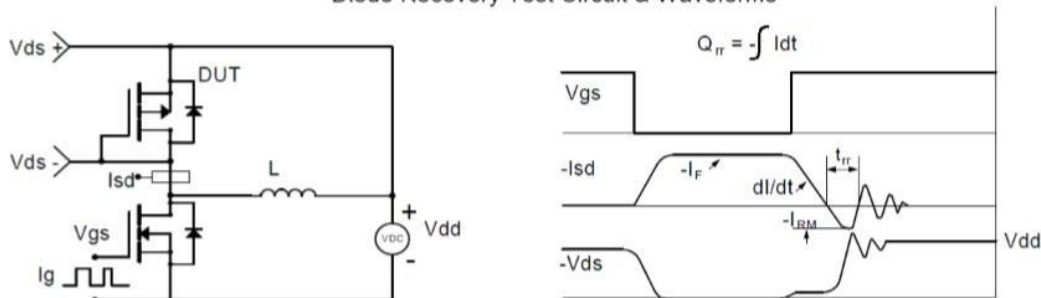
Resistive Switching Test Circuit & Waveforms

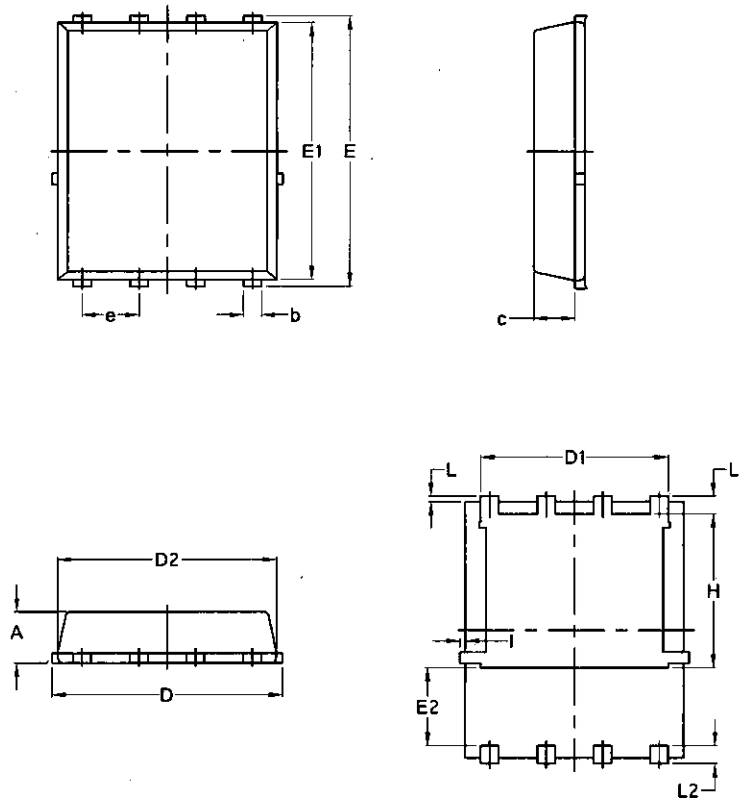


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Mechanical Data-DFN5*6-8L- Single


Symbol	Common			
	mm		Inch	
	Min	Max	Min	Max
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.0970	0.0324	0.082
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
E	5.95	6.15	0.2343	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.60	/	0.0630	/
e	1.27 BSC		0.05 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.50	0.0150	0.0197
L2	0.38	0.50	0.0150	0.0197
H	3.30	3.50	0.1299	0.1378
I	/	0.18	/	0.0070