

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

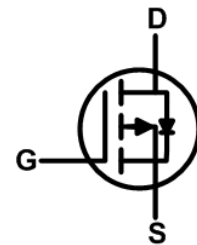
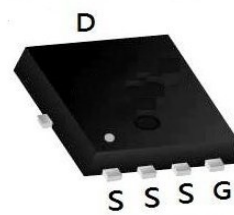

**Product Summary**

BVDSS	R <sub>DS(on)</sub>	ID
-18V	2.4mΩ	-85A

**Description**

The XXW20P80DF is the high cell density trenched P-ch MOSFETs, which provides excellent R<sub>DS(on)</sub> and efficiency for most of the small power switching and load switch applications.

The XXW20P80DF meet the RoHS and Green Product requirement with full function reliability approved.

**PDFN 5x6 Pin Configuration**

**Absolute Maximum Ratings** T<sub>c</sub>=25°C unless otherwise noted

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

**Thermal Characteristics**

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction to ambient	---	62	°C/W
R <sub>θJC</sub>	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 $25^\circ\text{C}$ , $I_D=-1\text{mA}$	---	-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	$\mu A$
		$V_{DS}=-16V, V_{GS}=0V, T_J=125^\circ\text{C}$	---	---	-30	$\mu A$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	$\pm 500$	nA

**On Characteristics**

$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-4.5V, I_D=-20A$	---	2.4	3.2	m $\Omega$
		$V_{GS}=-2.5V, I_D=-20A$	---	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
$\Delta V_{GS}$	$V_{GS(th)}$ 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 <sup>2,3</sup>	$V_{DS}=-16V, V_{GS}=-4.5V, I_D=-5A$	---	149		nC
$Q_{gs}$	Gate-Source Charge <sup>2,3</sup>		---	14.4		
$Q_{gd}$	Gate-Drain Charge <sup>2,3</sup>		---	42.8		
$T_{d(on)}$	Turn-On Delay Time <sup>2,3</sup>	$V_{DD}=-15V, V_{GS}=-4.5V, R_G=25\Omega$ $I_D=-1A$	---	21.2		nS
$T_r$	Rise Time <sup>2,3</sup>		---	20.6		
$T_{d(off)}$	Turn-Off Delay Time <sup>2,3</sup>		---	26		
$T_f$	Fall Time <sup>2,3</sup>		---	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	---	$\Omega$

**Drain-Source Diode Characteristics and Maximum Ratings**

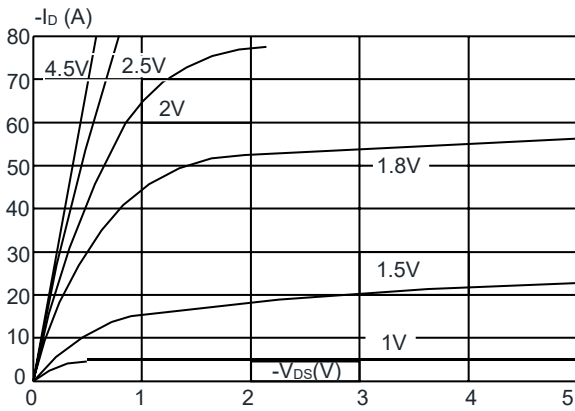
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$I_S$	Continuous Source Current	$V_G=V_D=0V$ , Force Current	---	---	-85	A
$I_{SM}$	Pulsed Source Current		---	---	-190	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1	V

Note :

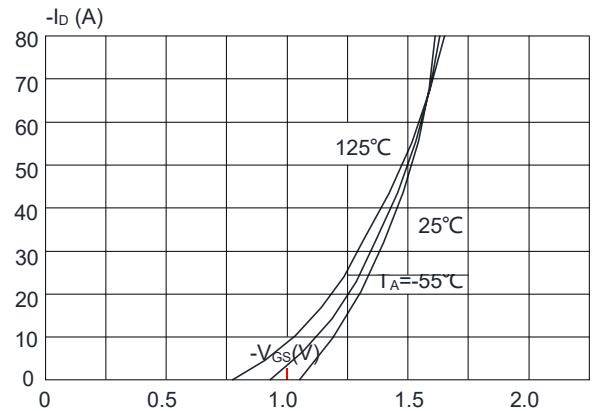
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.

**Typical Performance Characteristics**

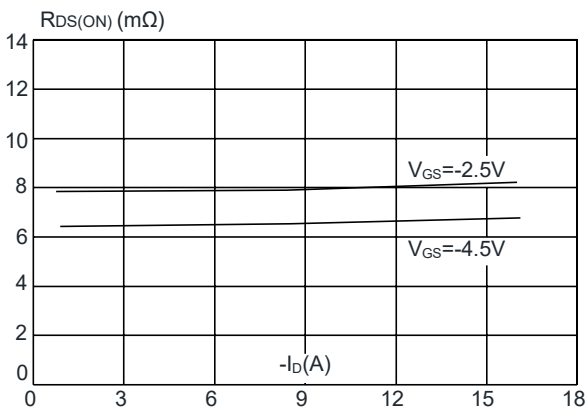
**Figure 1: Output Characteristics**



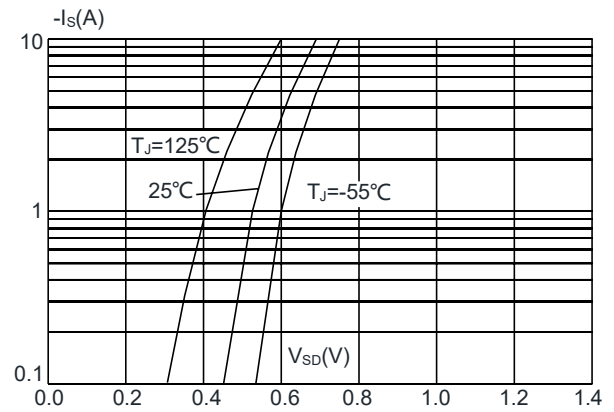
**Figure 2: Typical Transfer Characteristics**



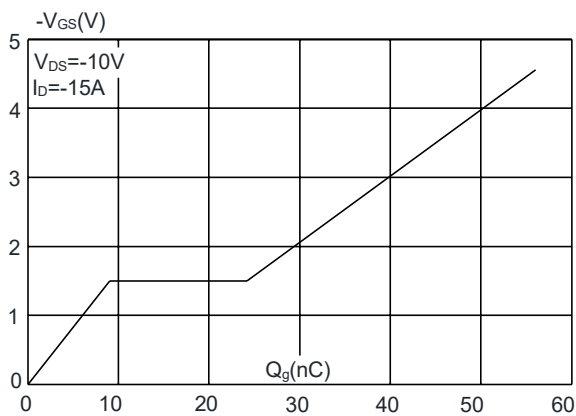
**Figure 3: On-resistance vs. Drain Current**



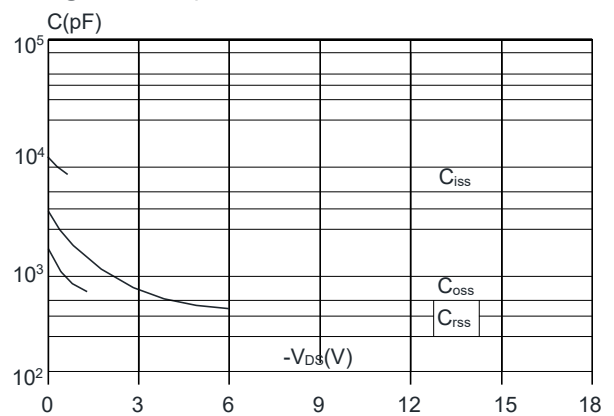
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**

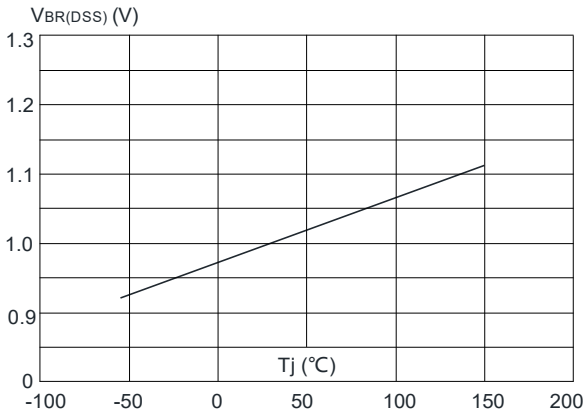


**Figure 6: Capacitance Characteristics**

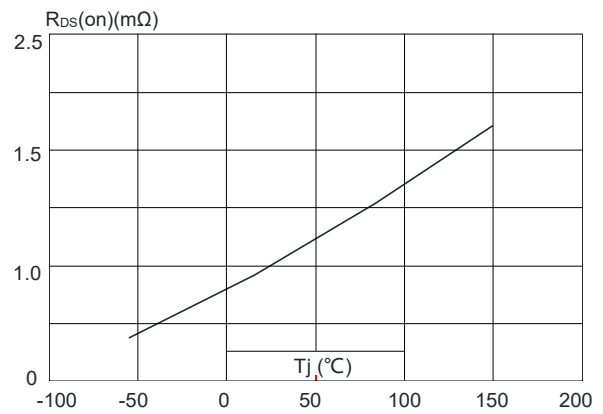


## P-Ch 18V Fast Switching MOSFETs

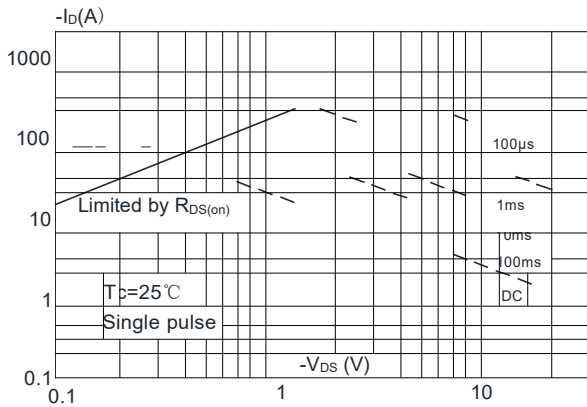
**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**



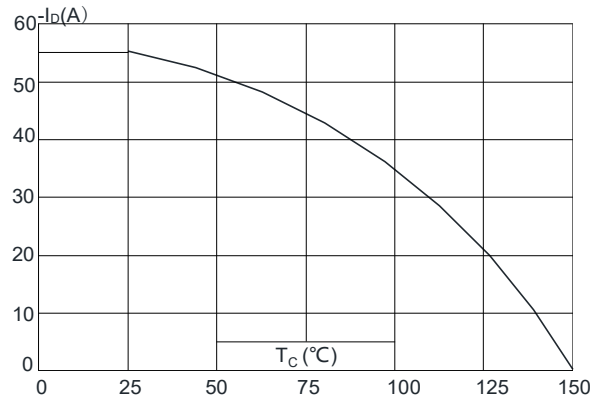
**Figure 8: Normalized on Resistance vs. Junction Temperature**



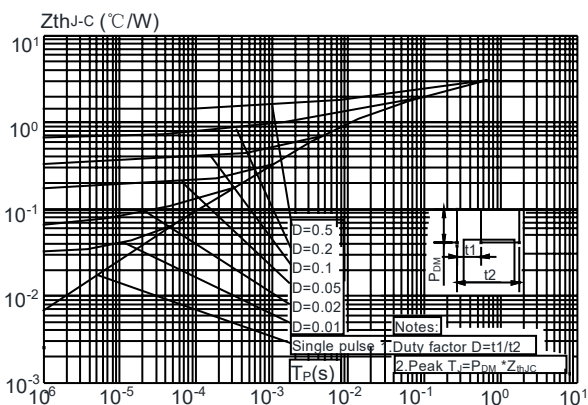
**Figure 9: Maximum Safe Operating Area**



**Figure 10: Maximum Continuous Drain Current vs. Case Temperature**

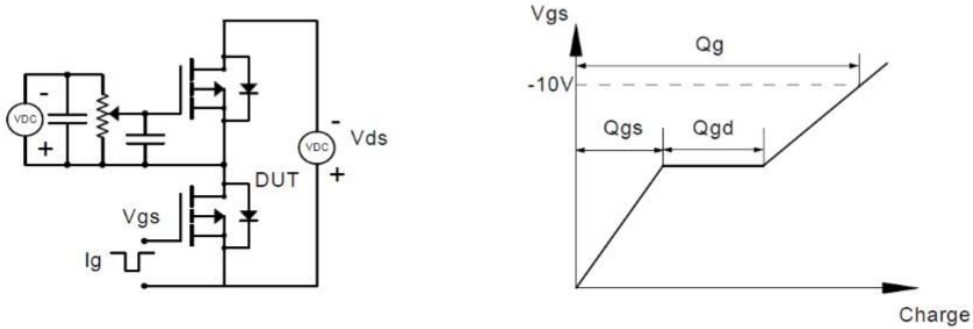


**Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case**

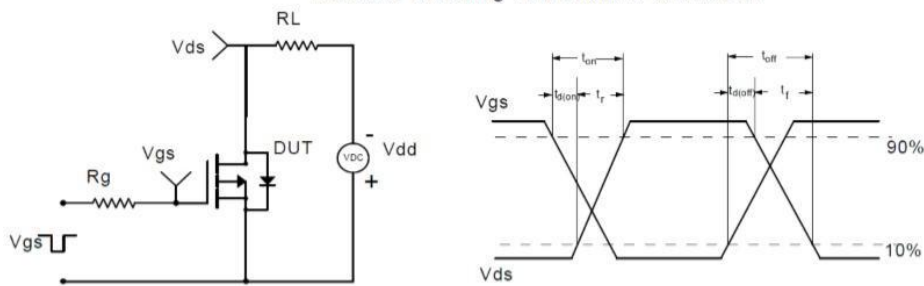


### Test Circuit

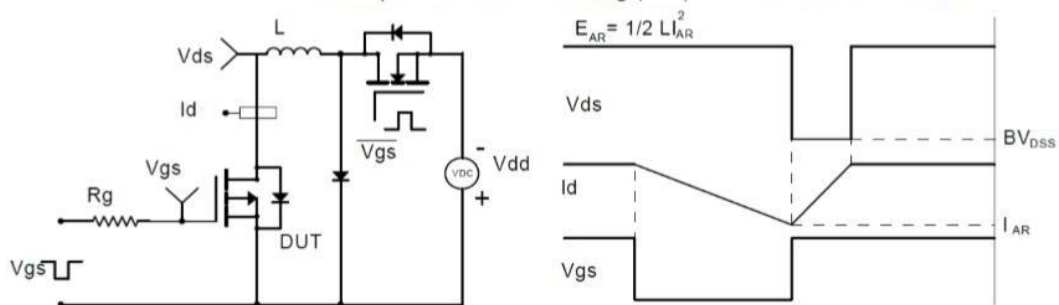
Gate Charge Test Circuit & Waveform



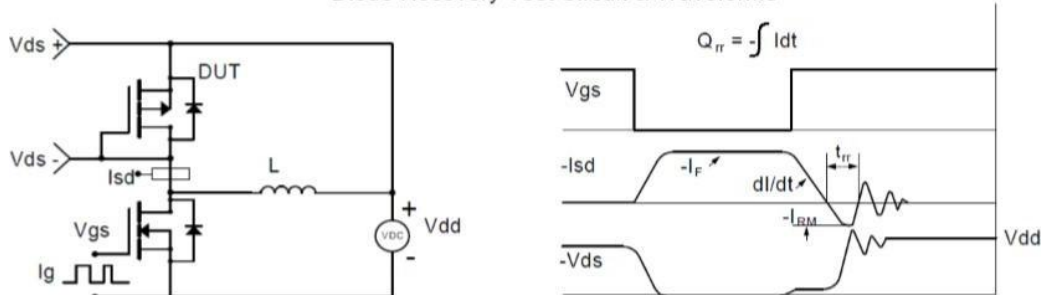
Resistive Switching Test Circuit & Waveforms

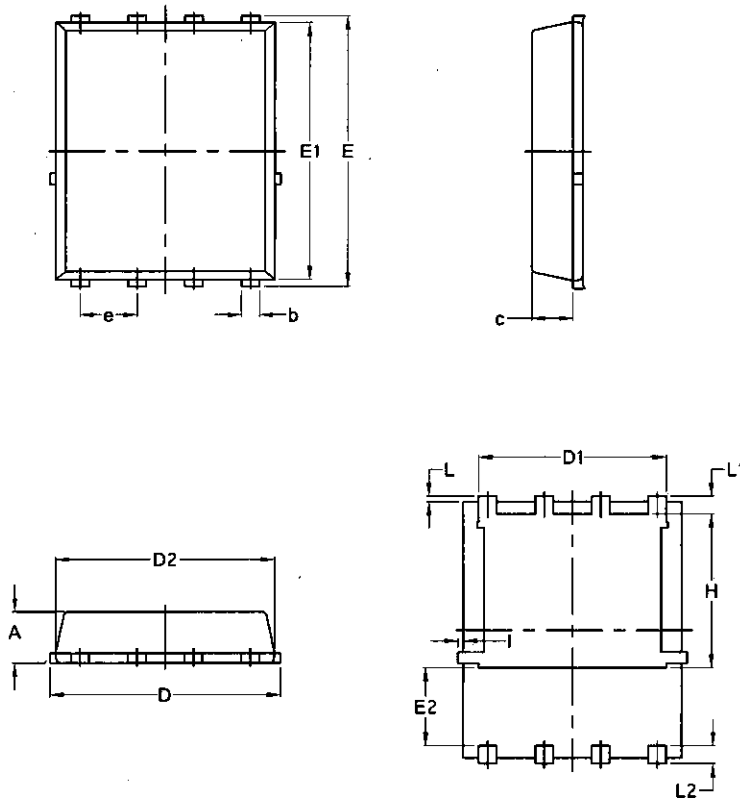


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



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