

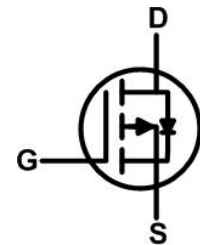
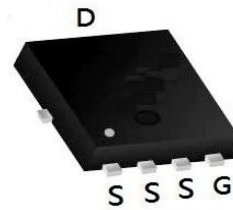
- ★ Super Low Gate Charge
- ★ Green Device Available
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology


**Product Summary**

BVDSS	RDS(on)	ID
-18V	3.6mΩ	-70A

**Description**

The XXW20P70F is the high cell density trenched P-ch MOSFETs, which provide excellent RDS(on) and gate charge for most of the synchronous buck converter applications. The XXW20P70F meet the RoHS and Green Product requirement with full function reliability approved.

**PRPAK5x6 Pin Configuration**

**Absolute Maximum Ratings**

Symbol	Parameter	Rating	Units
$V_{DS}$	Drain-Source Voltage	-18	V
$V_{GS}$	Gate-Source Voltage	$\pm 12$	V
$I_D@T_C=25^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V^1$	-70	A
$I_D@T_C=70^\circ C$	Continuous Drain Current, $V_{GS} @ -4.5V^1$	-53	A
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	-280	A
$P_D@T_C=25^\circ C$	Total Power Dissipation <sup>3</sup>	62	W
$P_D@T_C=70^\circ C$	Total Power Dissipation <sup>3</sup>	35	W
$T_{STG}$	Storage Temperature Range	-55 to 150	$^\circ C$
$T_J$	Operating Junction Temperature Range	-55 to 150	$^\circ C$

**Thermal Data**

Symbol	Parameter	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>1</sup>	3	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient <sup>1</sup> (t ≤ 10s)		$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case <sup>1</sup>		$^\circ C/W$

**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

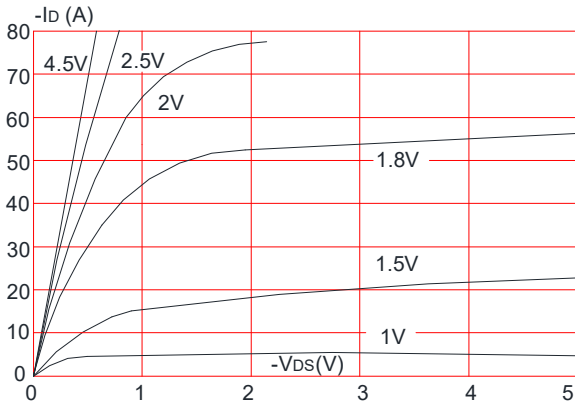
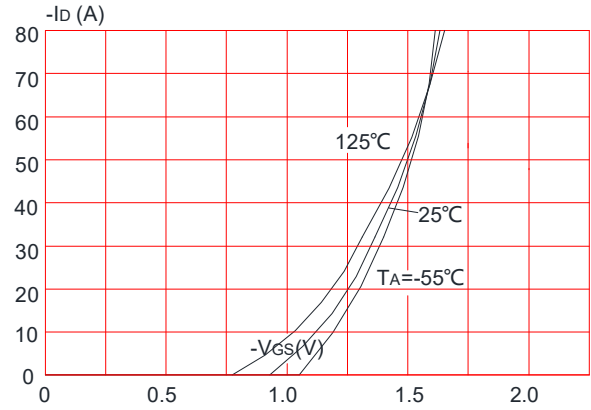
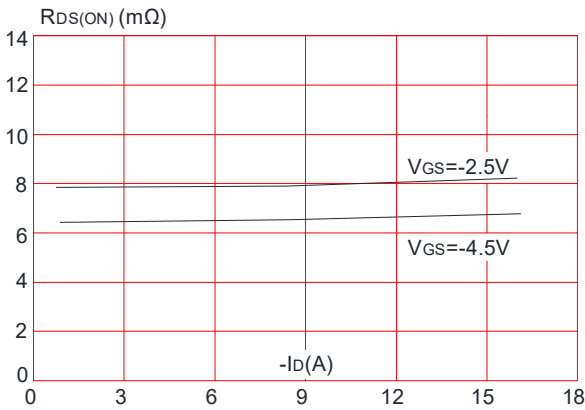
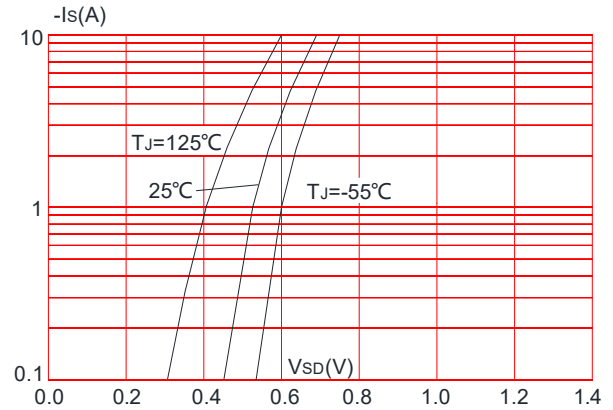
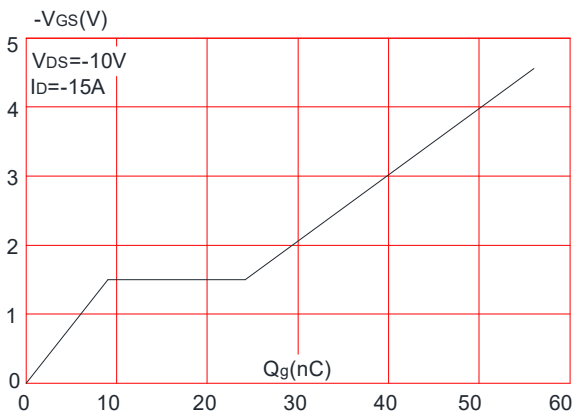
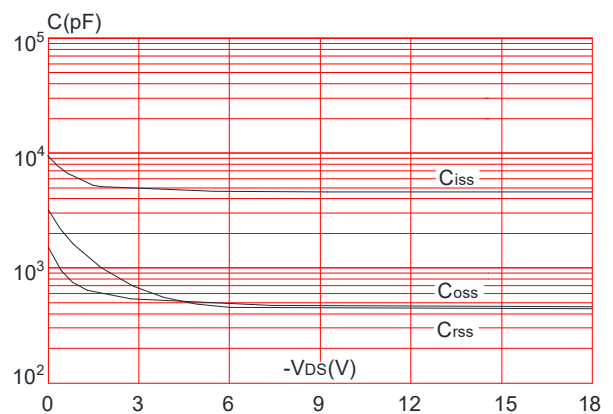
Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D = -250\mu A$	-15	18	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = -15V, V_{GS} = 0V,$	-	-	-1	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 12V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.35	-0.65	-1.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note3</small>	$V_{GS} = -4.5V, I_D = -15A$	-	3.6	5.5	m $\Omega$
		$V_{GS} = -2.5V, I_D = -12A$	-	4.5	92	
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS} = -10V, V_{GS} = 0V,$ $f = 1.0MHz$	-	6600	-	pF
$C_{oss}$	Output Capacitance		-	460	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	659	-	pF
$Q_g$	Total Gate Charge	$V_{DS} = -10V, I_D = -15A,$ $V_{GS} = -4.5V$	-	76	-	nC
$Q_{gs}$	Gate-Source Charge		-	10	-	nC
$Q_{gd}$	Gate-Drain("Miller") Charge		-	20	-	nC
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = -10V, I_D = -13A,$ $R_{GEN} = 2.7\Omega, V_{GS} = -10V$	-	14	-	ns
$t_r$	Turn-on Rise Time		-	130	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	187	-	ns
$t_f$	Turn-off Fall Time		-	190	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
$I_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	-70	A
$I_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-280	A
$V_{SD}$	Drain to Source Diode Forward Voltage	$V_{GS} = 0V, I_S = -30A$	-	-	-1.2	V
$t_{rr}$	Reverse Recovery Time	$T_J = 25^\circ\text{C}, I_{SD} = -15A,$	-	23	-	ns
$Q_{rr}$	Reverse Recovery Charge	$V_{GS} = 0V$ $di/dt = -100A/\mu s$	-	14	-	Nc

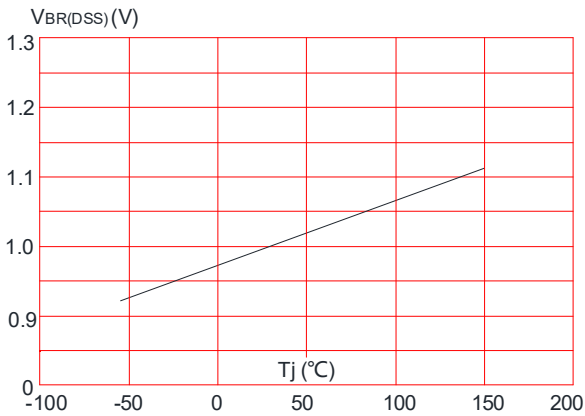
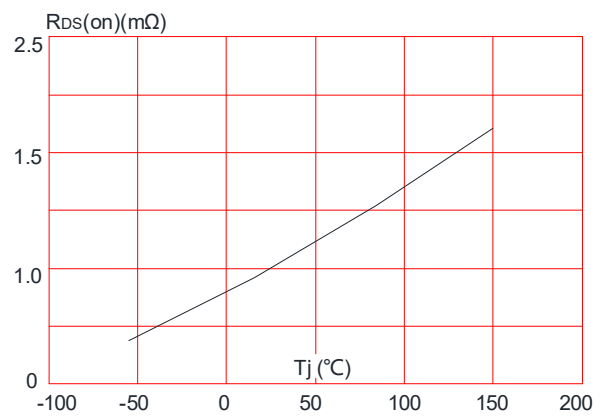
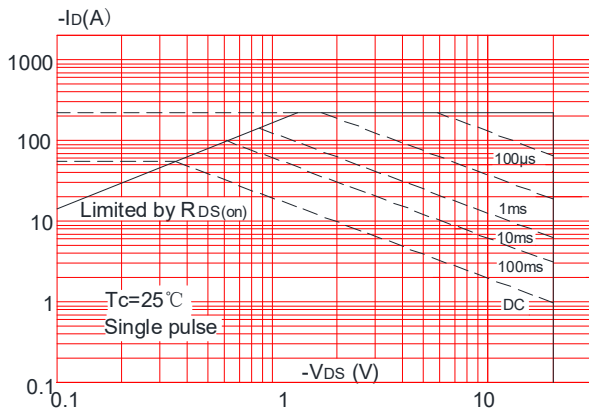
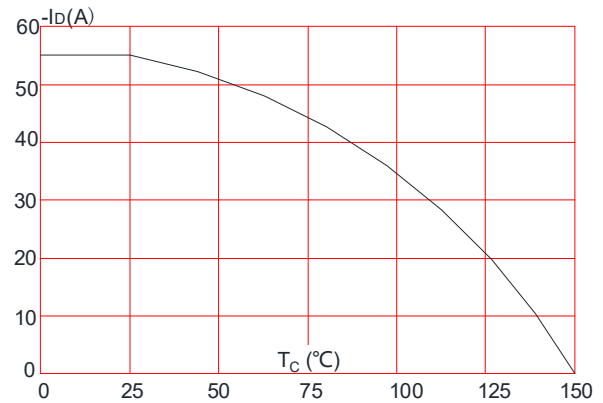
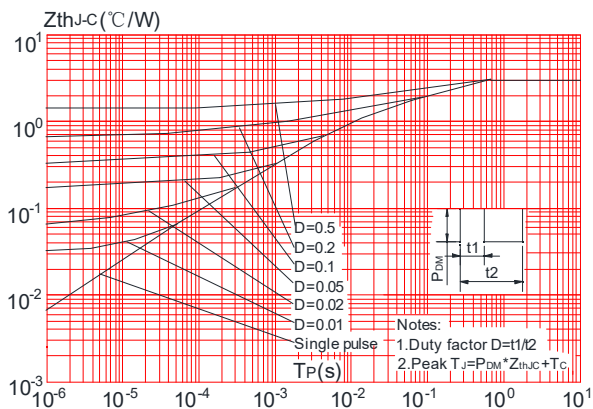
Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

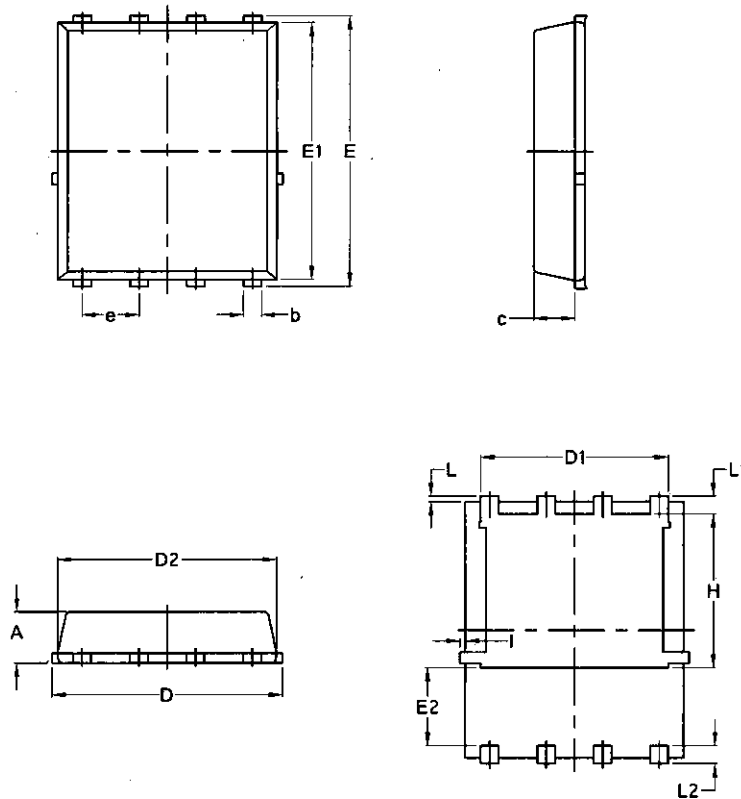
2. EAS condition:  $T_J = 25^\circ\text{C}, V_{DD} = -10V, V_G = -10V, R_G = 5.9\Omega, L = 0.5mh, I_{AS} = -16A$

3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 0.5\%$

## 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: 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**


**Package Mechanical Data-DFN5\*6-8L-JQ 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