

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

Product Summary

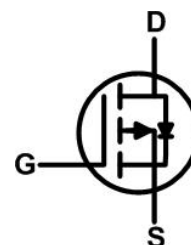
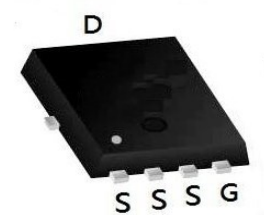


BVDSS	RDSON	ID
-18V	3.6mΩ	-70A

PDFN5060-8L Pin Configuration

Description

The UD20P70F is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications. The UD20P70F meet the RoHS and Green Product requirement with full function reliability approved.



Absolute Maximum Ratings

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

Thermal Data

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

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D = -250μA	-15	18	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -15V, V _{GS} = 0V,	-	-	-1	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} = ±12V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-0.35	-0.65	-1.0	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =-4.5V, I _D =-15A	-	3.6	5.5	mΩ
		V _{GS} =-2.5V, I _D =-12A	-	4.5	92	
Dynamic Characteristics						
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
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DD} =-10V, I _D =-13A, R _{GEN} =2.7Ω,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
Drain-Source Diode Characteristics and Maximum Ratings						
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℃,I _{SD} =-15A, V _{GS} =0V di/dt=-100A/μs	-	23	-	ns
Q _{rr}	Reverse Recovery Charge		-	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

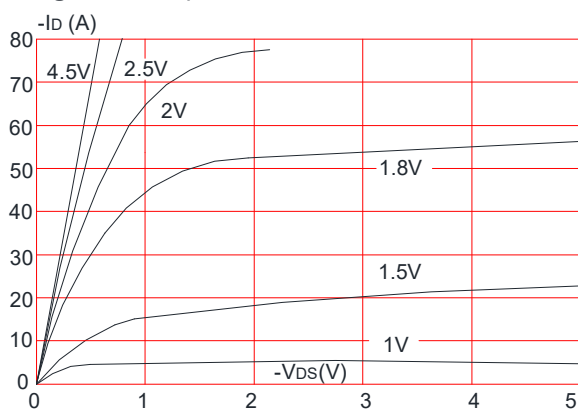


Figure 2: Typical Transfer Characteristics

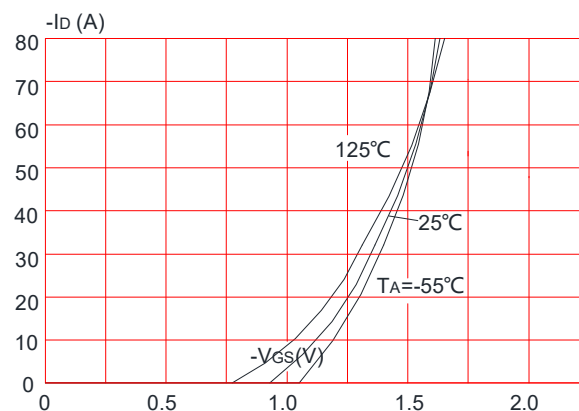


Figure 3: On-resistance vs. Drain Current

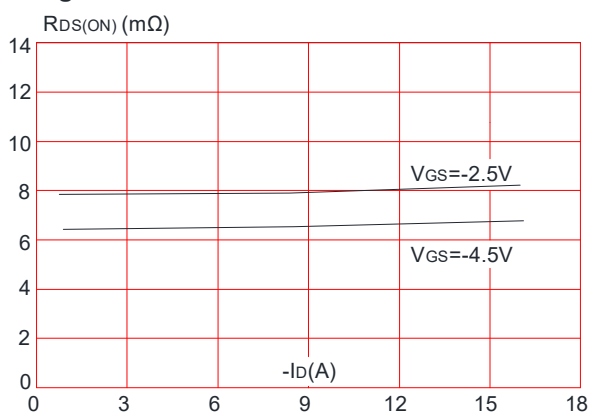


Figure 4: Body Diode Characteristics

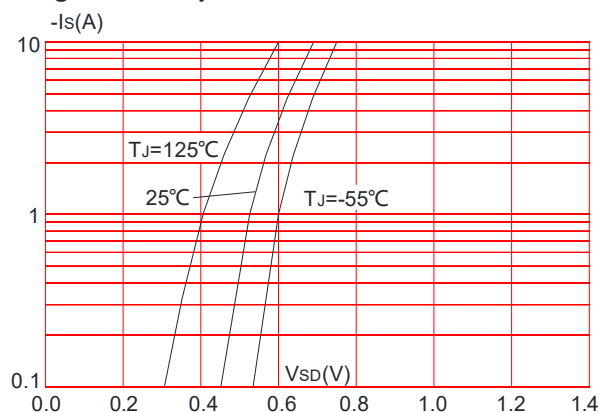


Figure 5: Gate Charge Characteristics

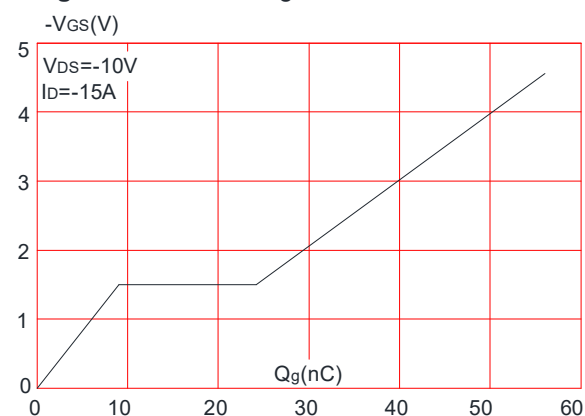


Figure 6: Capacitance Characteristics

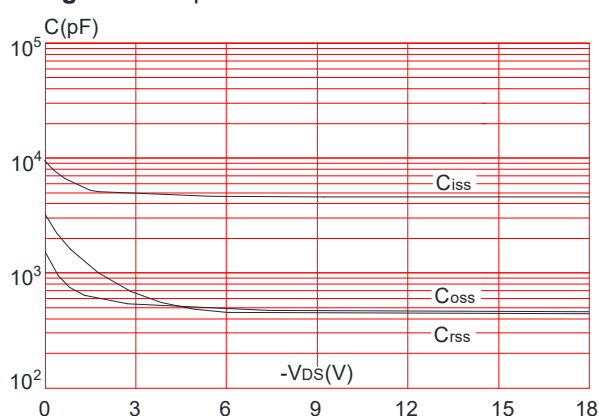


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

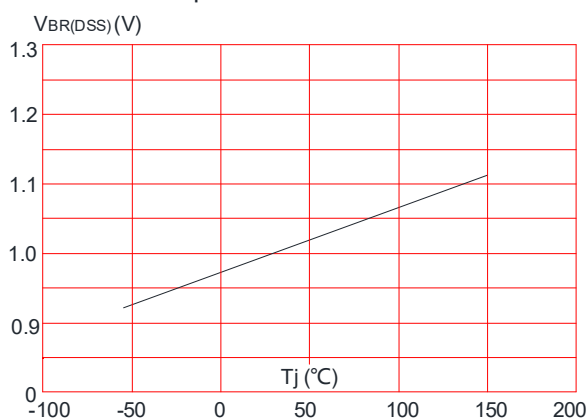


Figure 8: Normalized on Resistance vs. Junction Temperature

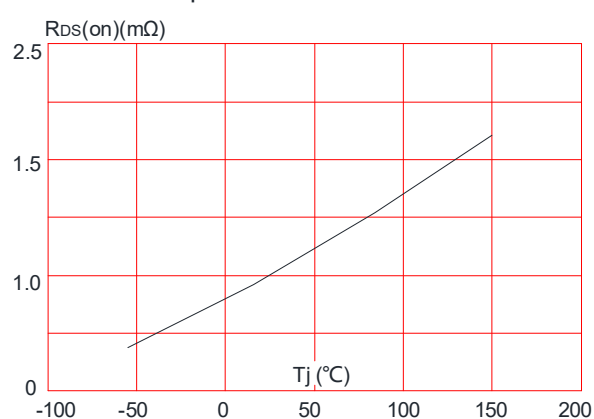


Figure 9: Maximum Safe Operating Area

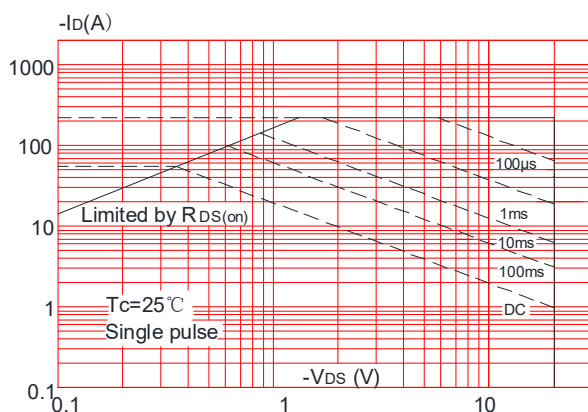


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

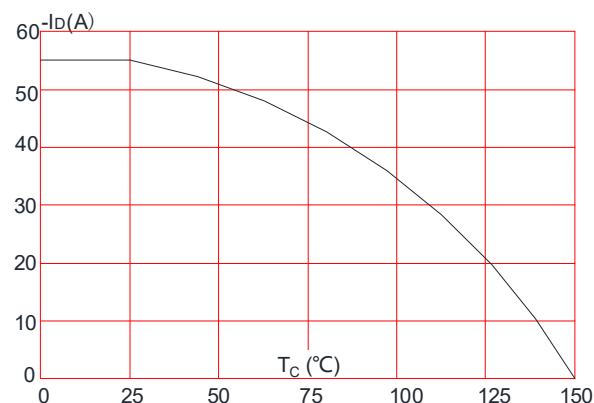
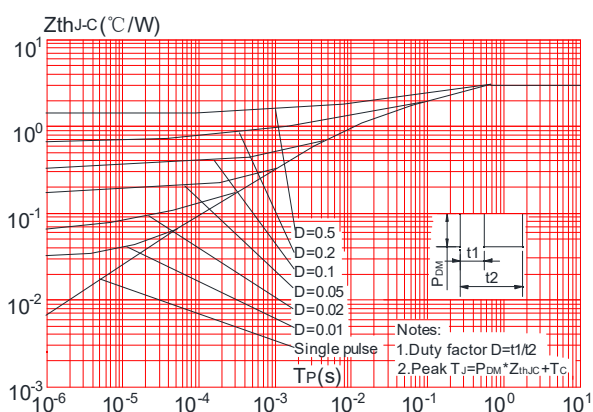
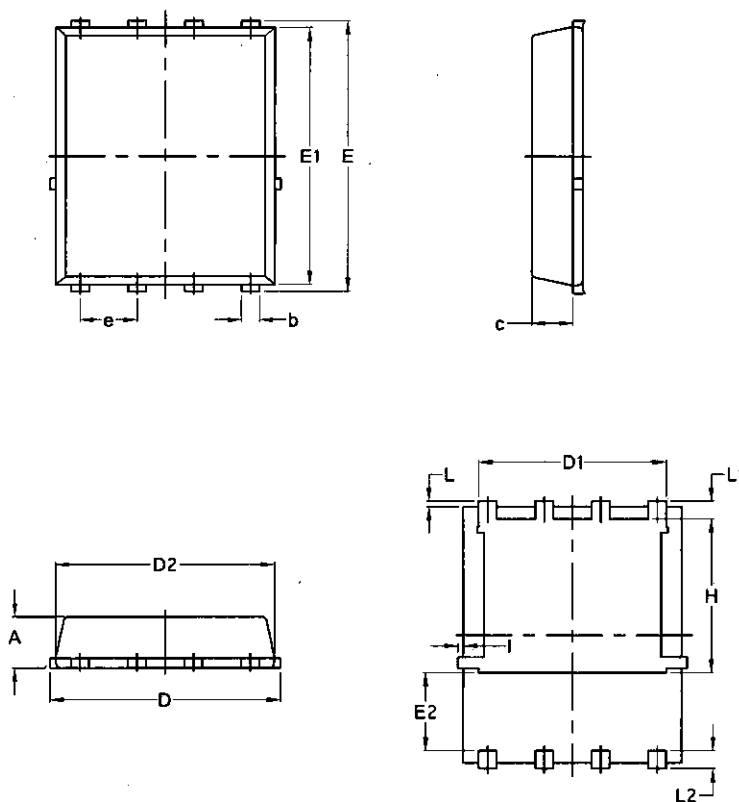


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Package Mechanical Data-PDFN5060-8L-Single



Symbol	Common			
	mm		Inch	
	Mim	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