AS70P20S

P-Channel Enhancement Mode Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
-20V	3mΩ@-4.5V	-70A
	4mΩ@-2.5V	
	8mΩ@-1.8V	

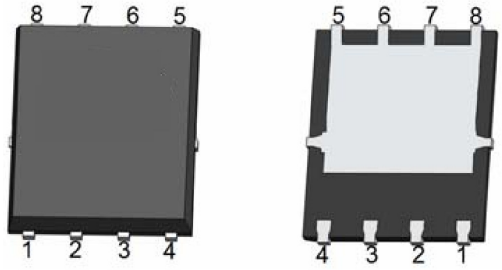
Feature

- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}

Application

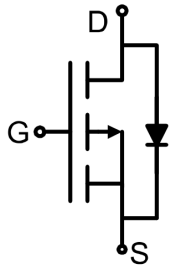
- Battery and loading switching

Package

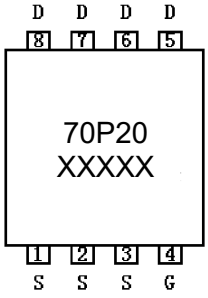


DFN5X6-8L

Circuit diagram



Marking



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Absolute maximum ratings (Ta=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±10	V
Continuous Drain Current	I_D	-70	A
Pulsed Drain Current	I_{DM}	-280	A
Power Dissipation	P_D	130	W
Thermal Resistance,Junction-to-Case	$R_{\theta JC}$	1.6	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{STG}	-55 ~ +150	℃

Electrical characteristics (T_A=25 ºC, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =-250μA	-20			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =-20V,V_{GS} = 0V			-1	μA
Gate-body leakage current	I_{GSS}	V_{GS} =±10V, V_{DS} = 0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250μA	-0.4		-1.0	V
Drain-source on-resistance[1]	$R_{DS(on)}$	V_{GS} =-4.5V, I_D =-20A		2.3	3	mΩ
		V_{GS} =-2.5V, I_D =-20A		2.8	4	
		V_{GS} =-1.8V, I_D =-20A		3.8	8	
Forward transconductance[1]	g_{FS}	V_{DS} =-5V, I_D =-20A	100			S
Dynamic characteristics[2]						
Input Capacitance	C_{iss}	V_{DS} =-10V,V_{GS} =0V,f =1MHz		4950		pF
Output Capacitance	C_{oss}			380		
Reverse Transfer Capacitance	C_{rss}			290		
Total Gate Charge	Q_g	V_{DS} =-10V,V_{GS} =-4.5V, ID =-20A		100		nC
Gate-Source Charge	Q_{gs}			21		
Gate-Drain Charge	Q_{gd}			32		
Turn-on delay time	$t_{d(on)}$	V_{DD}=-10V,V_{GS}=-4.5V, R_L=0.5Ω,R_{GEN}=3Ω		20		nS
Turn-on rise time	t_r			50		
Turn-off delay time	$t_{d(off)}$			100		
Turn-off fall time	t_f			40		
Source-Drain Diode characteristics						
Diode Forward Current[1]	I_S				-70	A
Diode Forward voltage	V_{DS}	V_{GS} =0V, I_S=-20A			-1.2	V
Reverse Recovery Time	t_{rr}	T_J = 25°C, I_F =-10A di/dt = 100A/μs [1]		48		nS
Reverse Recovery Charge	Q_{rr}			55		nC

Notes:

1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.

2) Guaranteed by design, not subject to production testing.

Typical Characteristics

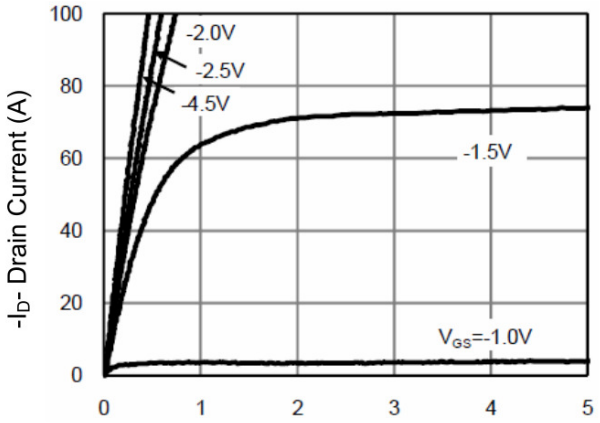


Figure 1 Output Characteristics

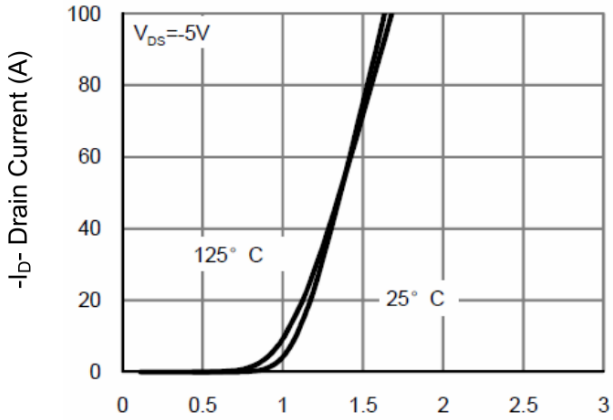


Figure 2 Transfer Characteristics

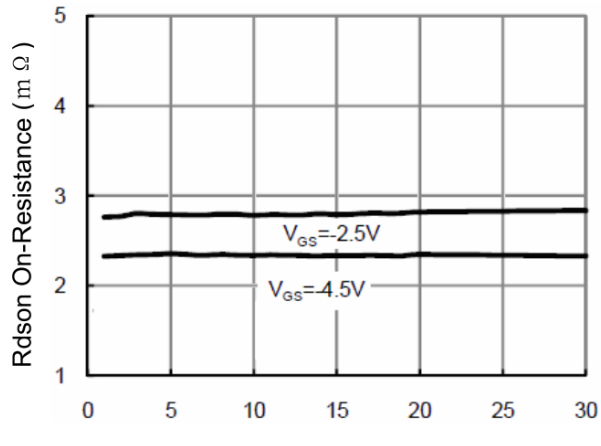


Figure 3 Rdson- Drain Current

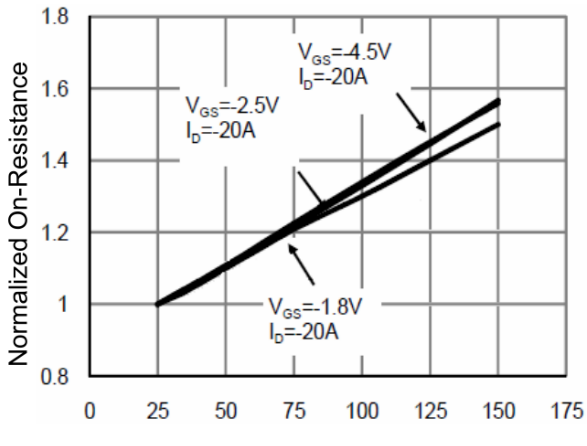


Figure 4 Rdson-Junction Temperature

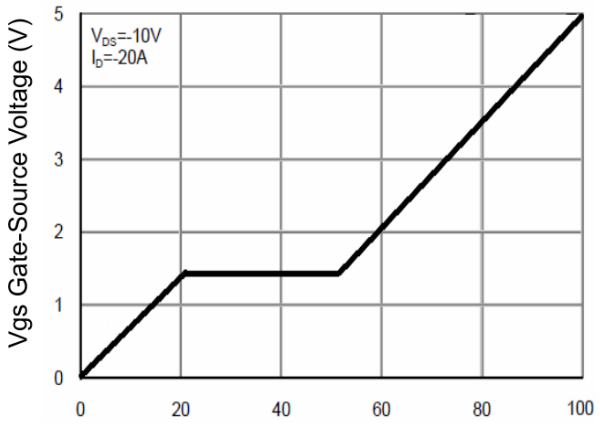


Figure 5 Gate Charge

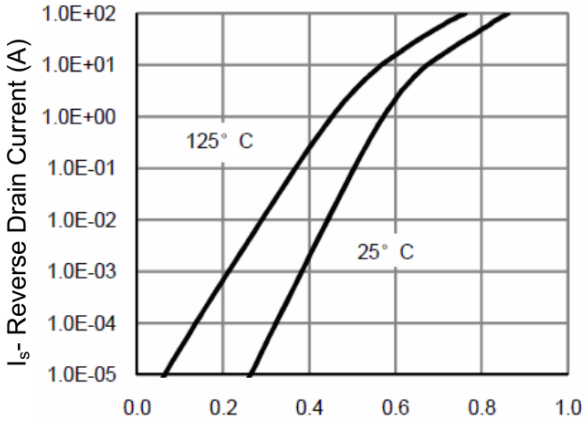


Figure 6 Source- Drain Diode Forward

Typical Characteristics

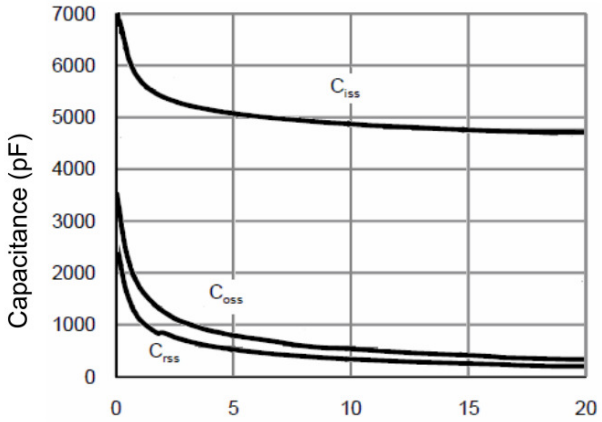


Figure 7 Capacitance vs Vds

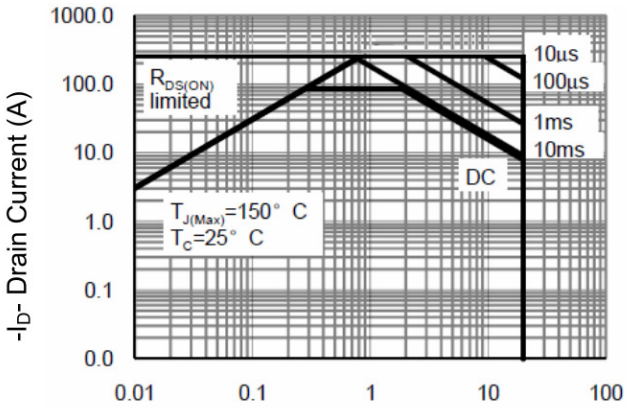


Figure 8 Safe Operation Area

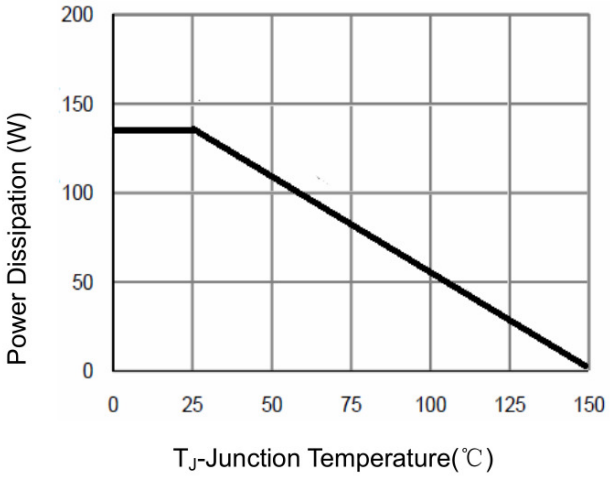


Figure 9 Power De-rating

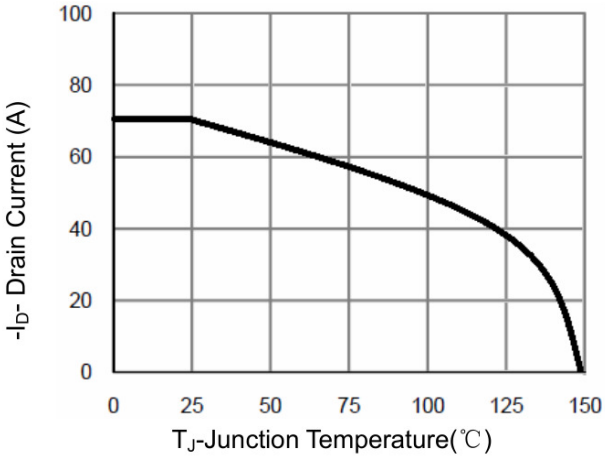


Figure 10 -Current De-rating

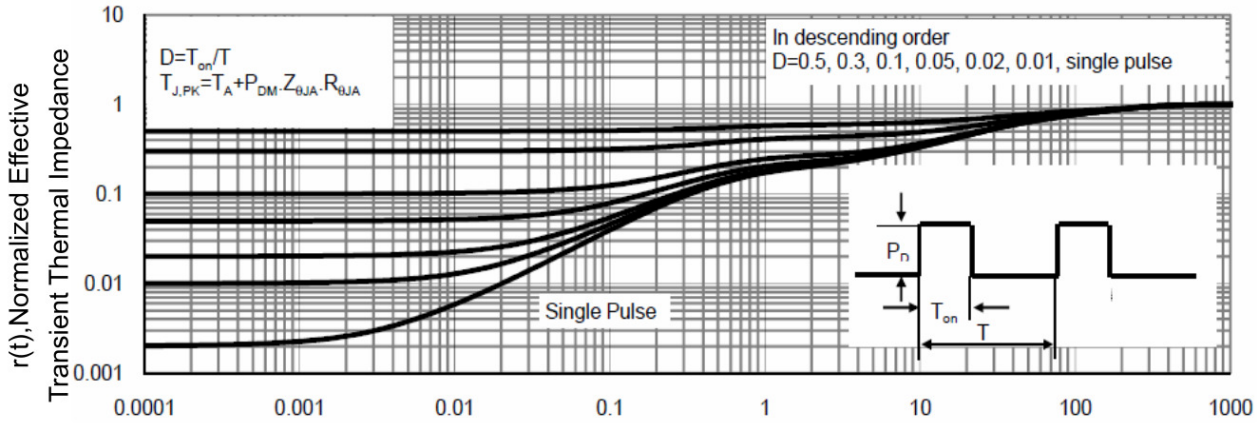
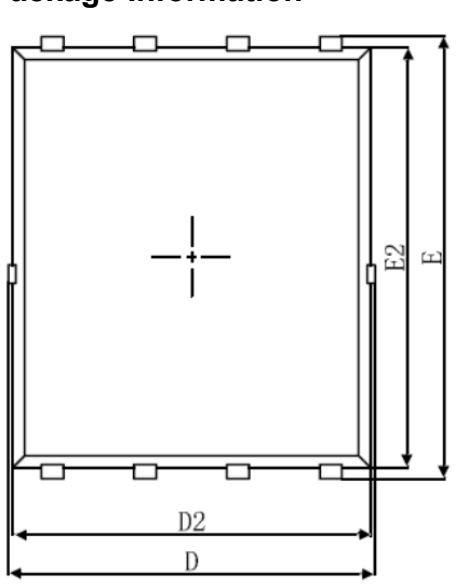
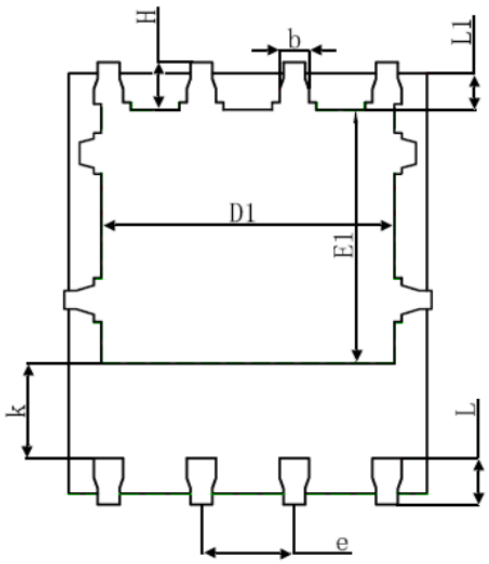


Figure 11 Normalized Maximum Transient Thermal Impedance

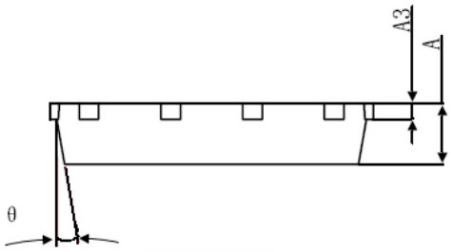
DFN5X6-8L Package Information



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	8°	12°	8°	12°