AP06850T

60V P-Channel MOSFET

Features

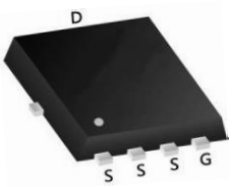
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

Product Summary

V_{DS}	-60	V
I_D	-85	A
$R_{DS(ON)}$ (at V_{GS}=-10V)	10	mΩ
$R_{DS(ON)}$ (at V_{GS}=-4.5V)	13	mΩ

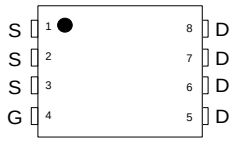
Applications

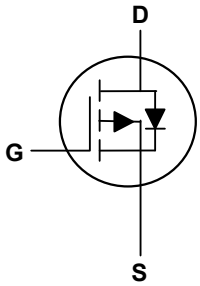
- High Frequency Point-of-Load,Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch



DFN5X6-8L Top View

Top View





Absolute Maximum Ratings(T_C=25℃, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, VGS @ -10V[1]	I_D@T_C=25℃	-85	A
Continuous Drain Current, VGS @ -10V[1]	I_D@T_C=100℃	-54	A
Pulsed Drain Current[2]	I_{DM}	-344	A
Single Pulse Avalanche Energy[3]	EAS	288.8	mJ
Avalanche Current	I_{AS}	18.9	A
Total Power Dissipation[4]	P_D@T_C=25℃	125	W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Ambient[1]	$R_{\theta JA}$	---	55	℃/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	---	1	℃/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=-250uA	-60	---	---	V
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	V_{GS}=-10V , I_D=-20A	---	7.5	10	mΩ
		V_{GS}=-4.5V , I_D=-10A	---	9.5	13	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =-250uA	-1.2	-1.8	-2.4	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-60V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Forward Transconductance	gfs	V_{DS}=-10V , I_D=-20A	---	90	---	S
Total Gate Charge	Q_g	V_{DS}=-30V , V_{GS}=-10V , I_D=-20A	---	58.4	---	nC
Gate-Source Charge	Q_{gs}		---	9.2	---	
Gate-Drain Charge	Q_{gd}		---	12	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=-30V , V_{GS}=-10V , R_G=3Ω, I_D=-20A	---	4.9	---	ns
Rise Time	T_r		---	3.3	---	
Turn-Off Delay Time	$T_{d(off)}$		---	16.8	---	
Fall Time	T_f		---	4.1	---	
Input Capacitance	C_{iss}	V_{DS}=-30V , V_{GS}=0V , f=1MHz	---	3890	---	pF
Output Capacitance	C_{oss}		---	637	---	
Reverse Transfer Capacitance	C_{rss}		---	33	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[1,5]	I_S	Tc=25℃	---	---	-86	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=-20A , T_J=25℃	---	---	-1.2	V
Reverse Recovery Time	t_{rr}	I_F=-20A ,di/dt=100A/μs, T_J=25℃	---	60	---	nS
Reverse Recovery Charge	Q_{rr}		---	142	---	nC

Note:

1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating . The test condition is V_{DD}=-25V,V_{GS}=-10V,L=0.4mH,I_{AS}=-38A

4.The power dissipation is limited by 150℃ junction temperature

5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

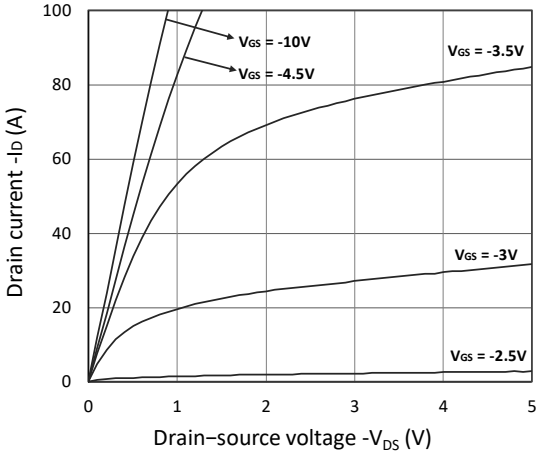


Figure 1. Output Characteristics

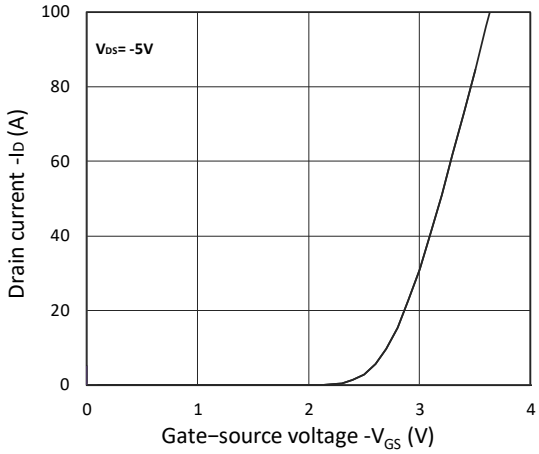


Figure 2. Transfer Characteristics

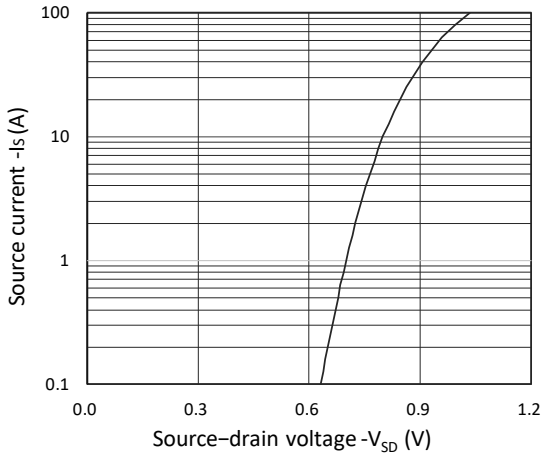


Figure 3. Forward Characteristics of Reverse

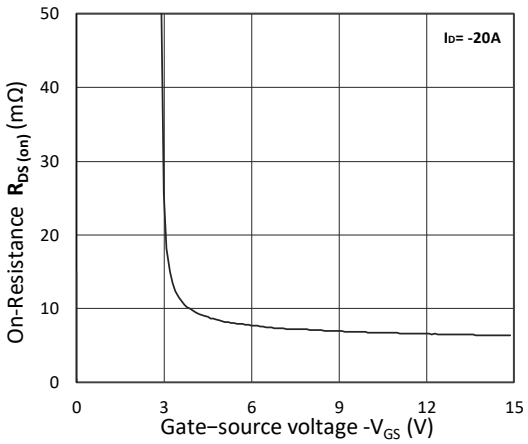


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

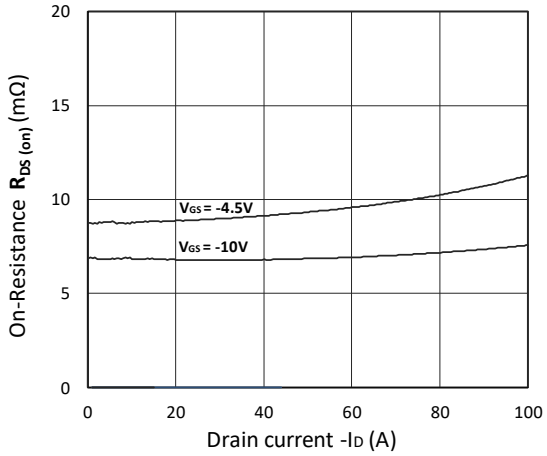


Figure 5. $R_{DS(ON)}$ vs. I_D

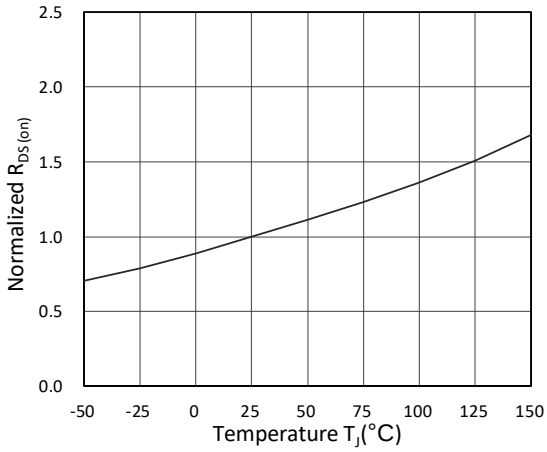


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

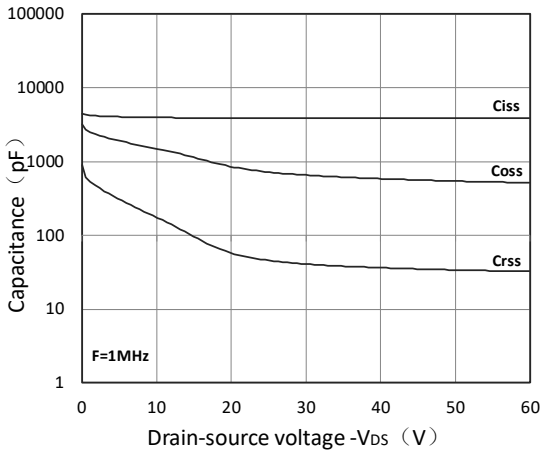


Figure 7. Capacitance Characteristics

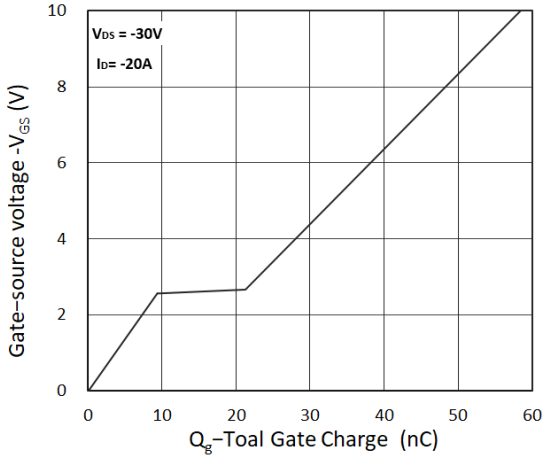


Figure 8. Gate Charge Characteristics

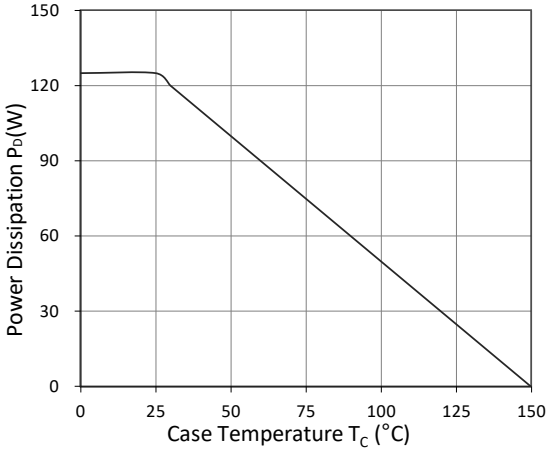


Figure 9. Power Dissipation

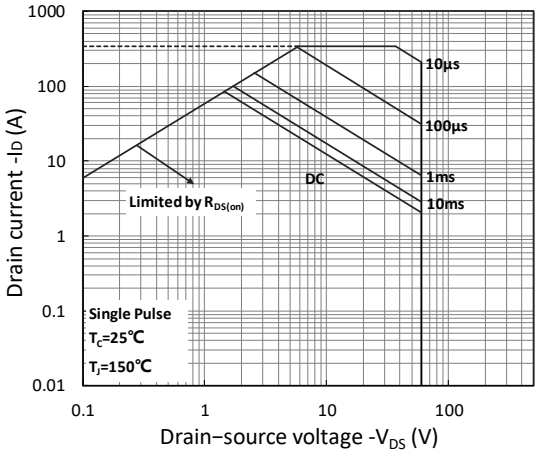


Figure10. Safe Operating Area

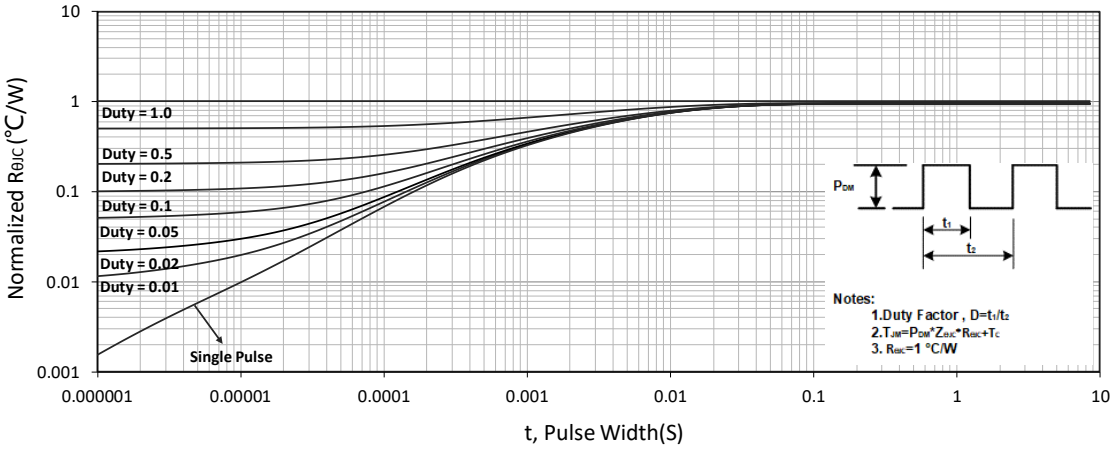
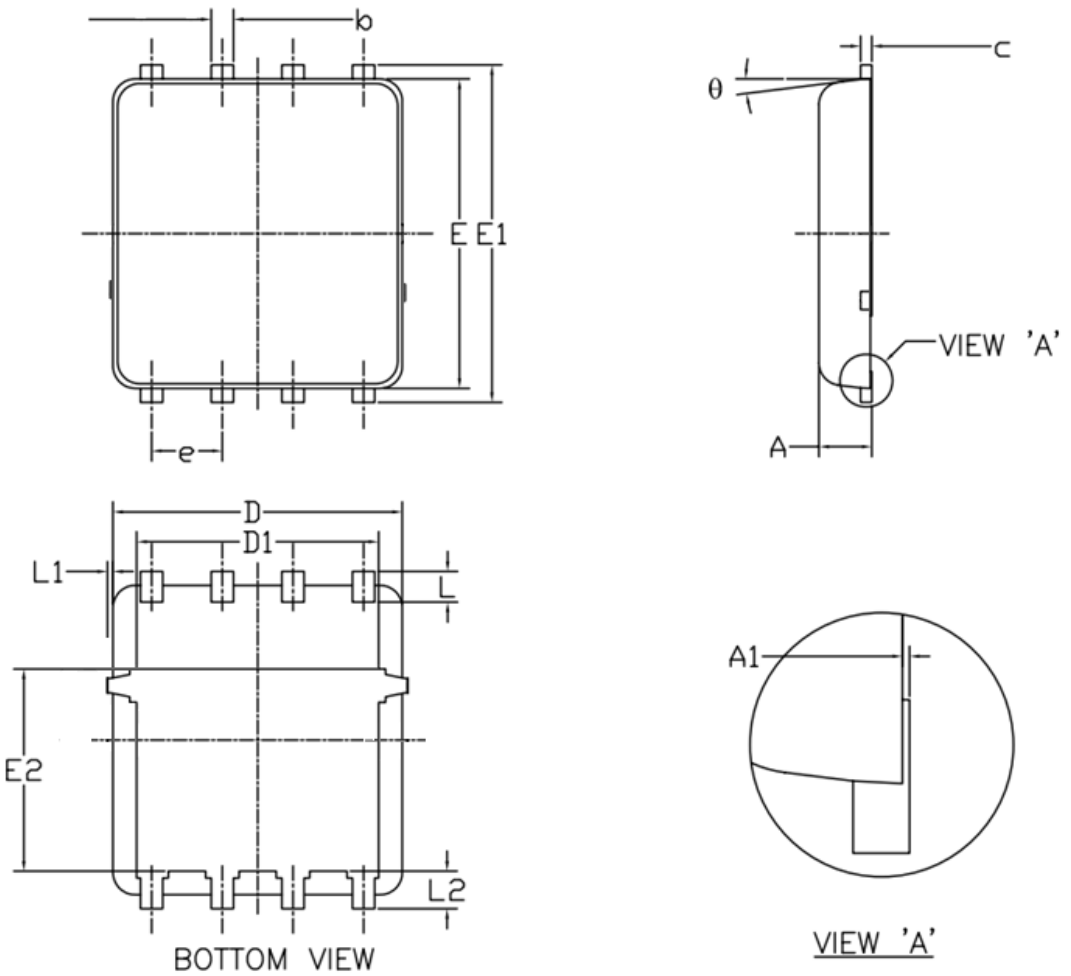


Figure 11. Normalized Maximum Transient Thermal Impedance

DFN5X6-8L Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	0.90	1.00	1.20	**E1**	5.90	6.10	6.35
A1	0.00	--	0.05	**E2**	3.38	3.58	3.92
b	0.30	0.40	0.51	**e**	1.27 BSC		
c	0.20	0.25	0.33	**L**	0.51	0.61	0.71
D	4.80	4.90	5.40	**L1**	--	--	0.15
D1	3.61	4.00	4.25	**L2**	0.41	0.51	0.61
E	5.65	5.80	6.06	**θ**	0°	--	12°