AP03450T

30V P-Channel MOSFET

Features

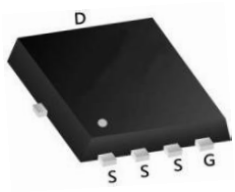
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available

Product Summary

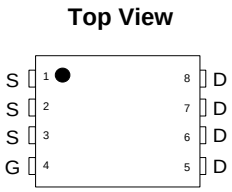
V_{DS}	-30	V
I_D	-45	A
$R_{DS(ON)}$ (at V_{GS}=-10V)	15	mΩ
$R_{DS(ON)}$ (at V_{GS}=-4.5V)	25	mΩ

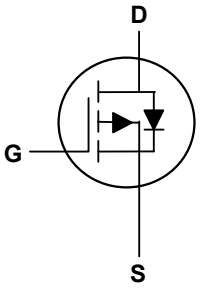
Applications

- High Frequency Point-of-Load,Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch



DFN5X6-8L Top View





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

Parameter	Symbol	Rating		Units
		10S	Steady State	
Drain-Source Voltage	V_{DS}	-30		V
Gate-Source Voltage	V_{GS}	±25		V
Continuous Drain Current, VGS @ -10V[1]	I_D@T_C=25℃	-45		A
Continuous Drain Current, VGS @ -10V[1]	I_D@T_C=100℃	-30		A
Continuous Drain Current, VGS @ -10V[1]	I_D@T_A=25℃	-15	-9.6	A
Continuous Drain Current, VGS @ -10V[1]	I_D@T_A=70℃	-12	-7.7	A
Pulsed Drain Current[2]	I_{DM}	-150		A
Single Pulse Avalanche Energy[3]	EAS	125		mJ
Avalanche Current	I_{AS}	-50		A
Total Power Dissipation[4]	P_D@T_C=25℃	45		W
Total Power Dissipation[4]	P_D@T_A=25℃	5	2	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](t ≤10s)	$R_{\theta JA}$	---	25	℃/W
Thermal Resistance Junction-Ambient[1]		---	62	℃/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	---	2.8	℃/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	-30	---	---	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25℃ , I_D=-1mA	---	-0.023	---	V/℃
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	V_{GS}=-10V , I_D=-30A	---	---	15	mΩ
		V_{GS}=-4.5V , I_D=-15A	---	---	25	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =-250uA	-1.0	---	-2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		---	4.6	---	mV/℃
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-24V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-24V , V_{GS}=0V , T_J=55℃	---	---	-5	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±25V , V_{DS}=0V	---	---	±100	nA
Forward Transconductance	gfs	V_{DS}=-5V , I_D=-30A	---	30	---	S
Gate Resistance	R_g	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	9	---	Ω
Total Gate Charge	Q_g	V_{DS}=-15V , V_{GS}=-4.5V , I_D=-15A	---	22	---	nC
Gate-Source Charge	Q_{gs}		---	8.7	---	
Gate-Drain Charge	Q_{gd}		---	7.2	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=-15V , V_{GS}=-10V , R_G=3.3Ω, I_D=-15A	---	8	---	ns
Rise Time	T_r		---	73.7	---	
Turn-Off Delay Time	$T_{d(off)}$		---	61.8	---	
Fall Time	T_f		---	24.4	---	
Input Capacitance	C_{iss}	V_{DS}=-15V , V_{GS}=0V , f=1MHz	---	2215	---	pF
Output Capacitance	C_{oss}		---	310	---	
Reverse Transfer Capacitance	C_{rss}		---	237	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[1,5]	I_S	V_G=V_D=0V , Force Current	---	---	-45	A
Pulsed Source Current[2,5]	I_{SM}		---	---	-150	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=-1A , T_J=25℃	---	---	-1	V
Reverse Recovery Time	trr	I_F=-15A , di/dt=100A/μs， T_J=25℃	---	19	---	nS
Reverse Recovery Charge	Qrr		---	9	---	nC

Note:

1.The data tested by surface mounted on a 1 inch^2 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=0.1mH

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

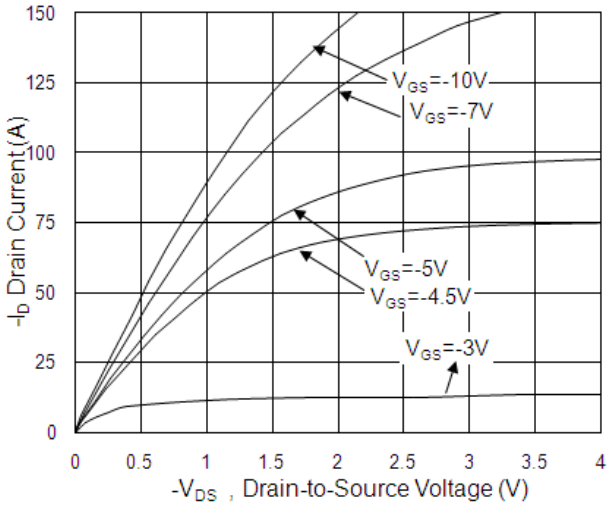


Fig.1 Typical Output Characteristics

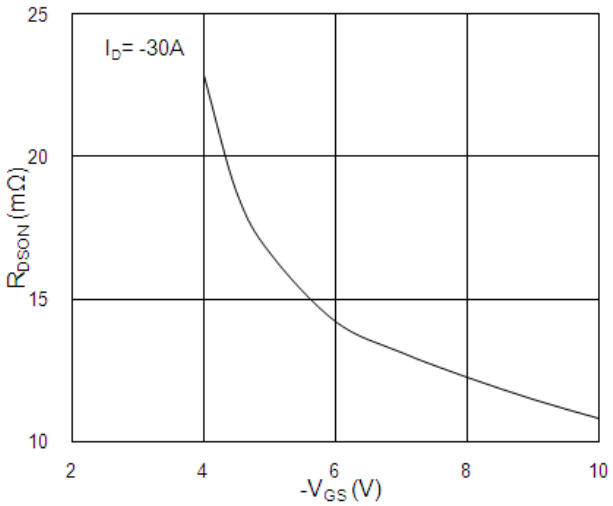


Fig.2 On-Resistance vs. G-S Voltage

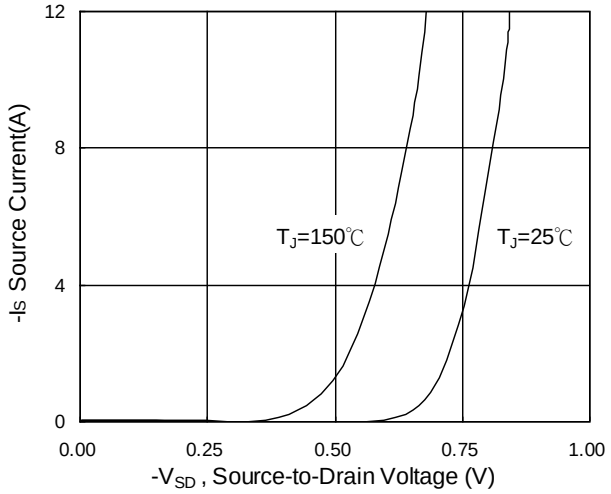


Fig.3 Forward Characteristics of Reverse

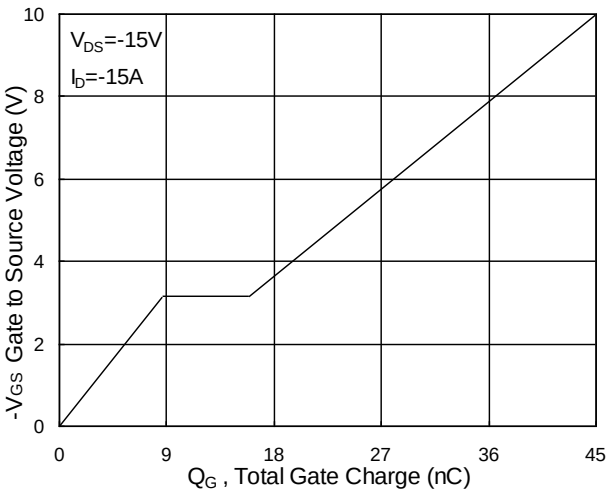


Fig.4 Gate-charge Characteristics

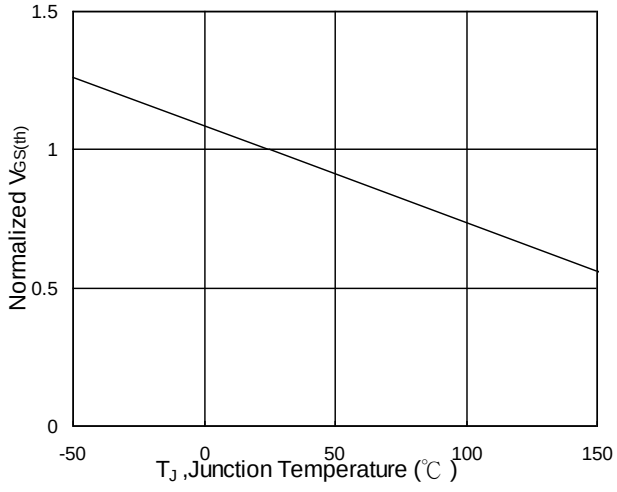


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

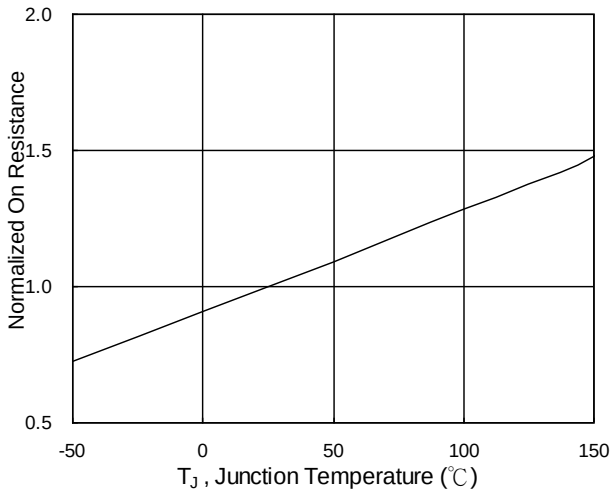


Fig.6 Normalized R_{DSON} vs. T_J

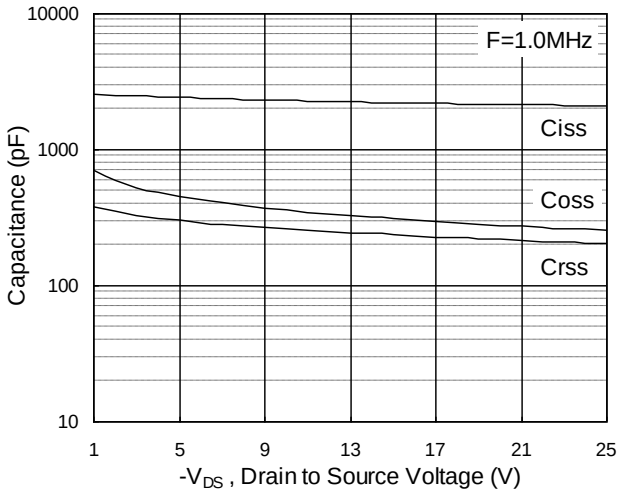


Fig.7 Capacitance

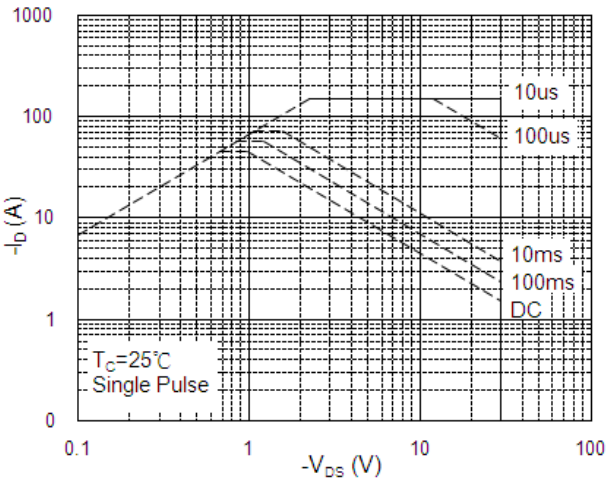


Fig.8 Safe Operating Area

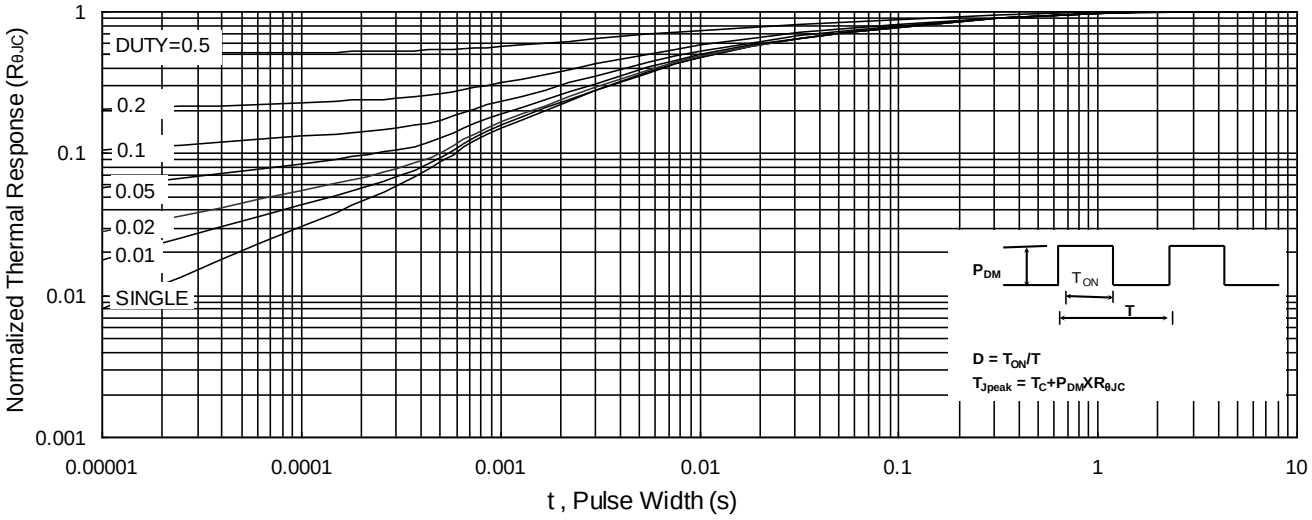


Fig.9 Normalized Maximum Transient Thermal Impedance

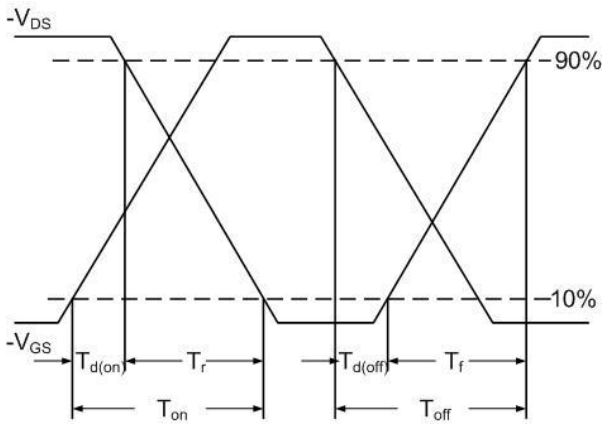


Fig.10 Switching Time Waveform

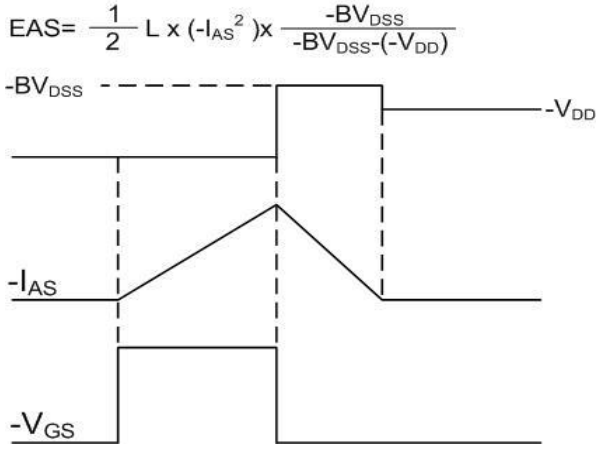
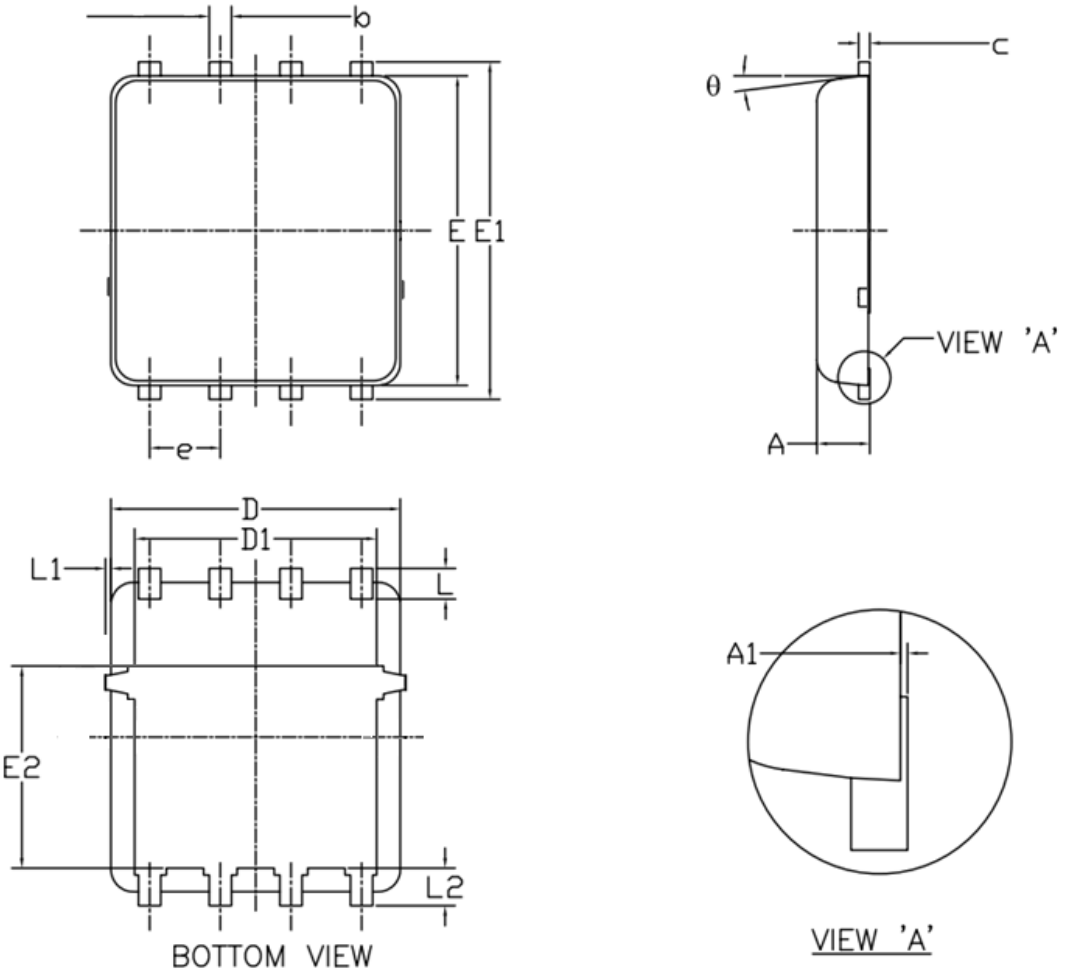


Fig.11 Unclamped Inductive Switching Waveform

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°