AT1820T

200V N-Channel MOSFET

Features

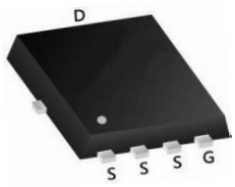
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

Product Summary

V_{DS}	200	V
I_D	18	A
$R_{DS(ON)}$ (at V_{GS}=10V)	80	mΩ

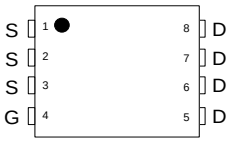
Applications

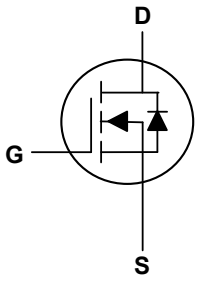
- High Frequency Point-of-Load Synchronous Buck Converter
- Networking DC-DC Power System
- LCD/LED Back Light



DFN5X6-8L Top View

Top View





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

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D@T_C=25℃	18	A
Continuous Drain Current	I_D@T_C=100℃	12.6	A
Pulsed Drain Current[1]	I_{DM}	72	A
Single Pulse Avalanche Energy[3]	EAS	180	mJ
Total Power Dissipation	P_D	105	W
Derating factor		0.84	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-Case[1]	$R_{\theta JC}$	---	1.2	℃/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	200	---	---	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V , I_D=18A	---	70	80	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	2.5	3.5	4.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=200V , 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}=5V , I_D=18A	20	---	---	S
Total Gate Charge	Q_g	V_{DS}=100V , V_{GS}=10V , I_D=18A	---	18	---	nC
Gate-Source Charge	Q_{gs}		---	7.5	---	
Gate-Drain Charge	Q_{gd}		---	4.6	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=100V ,R_L=5.5Ω , V_{GS}=10V , R_G=3Ω	---	6	---	ns
Rise Time	T_r		---	7	---	
Turn-Off Delay Time	$T_{d(off)}$		---	15	---	
Fall Time	T_f		---	4	---	
Input Capacitance	C_{iss}	V_{DS}=100V , V_{GS}=0V , f=1MHz	---	951	---	pF
Output Capacitance	C_{oss}		---	82	---	
Reverse Transfer Capacitance	C_{rss}		---	2	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[1]	I_S		---	---	18	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=18A , T_J=25℃	---	---	1.2	V
Reverse Recovery Time	t_{rr}	I_F=18A ,di/dt=100A/μs, T_J=25℃	---	30	---	nS
Reverse Recovery Charge	Q_{rr}		---	125	---	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}=50V,V_{GS}=10V,L=0.5mH,R_G=25Ω

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

Typical Characteristics

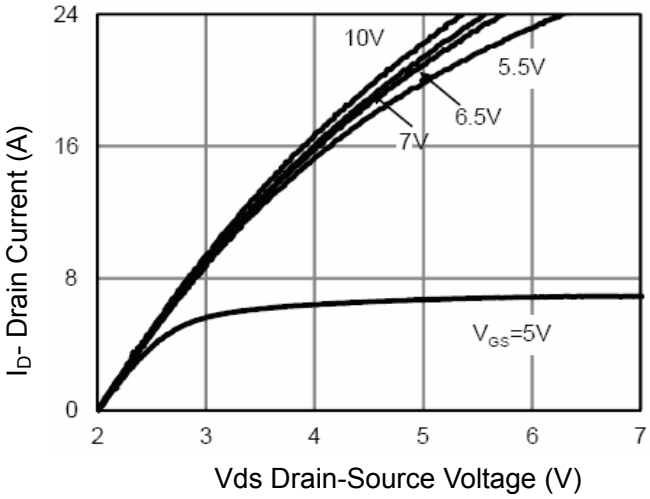


Figure 1 Output Characteristics

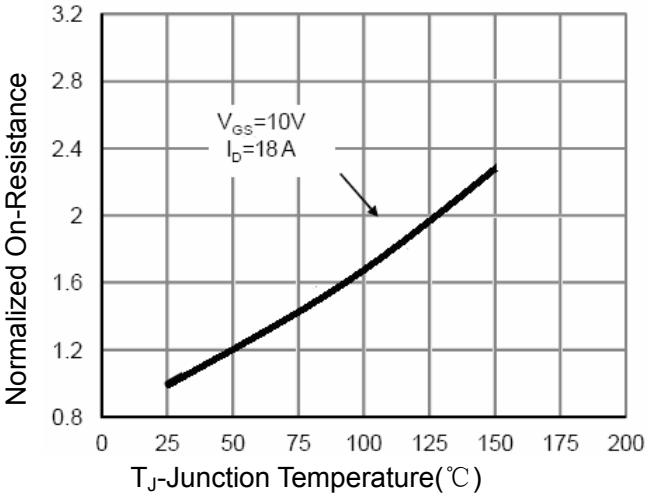


Figure 4 Rdson-Junction Temperature

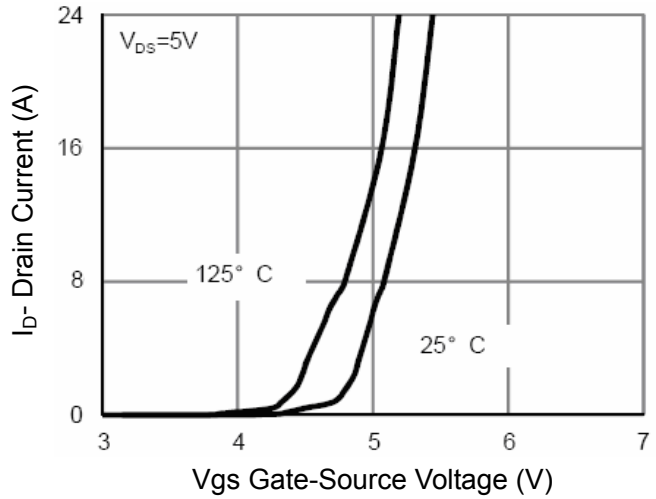


Figure 2 Transfer Characteristics

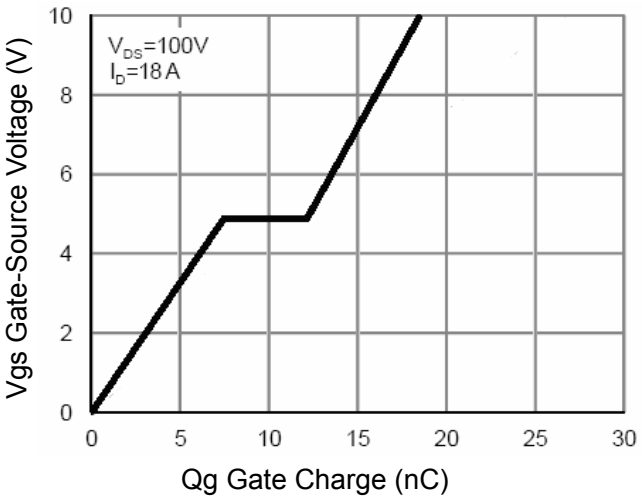


Figure 5 Gate Charge

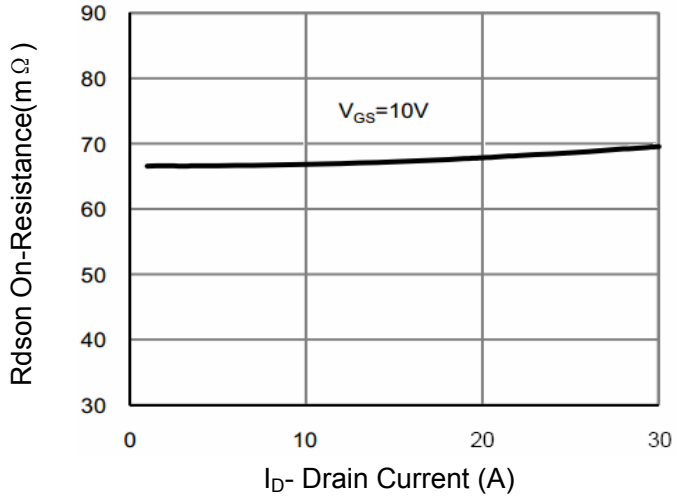


Figure 3 Rdson- Drain Current

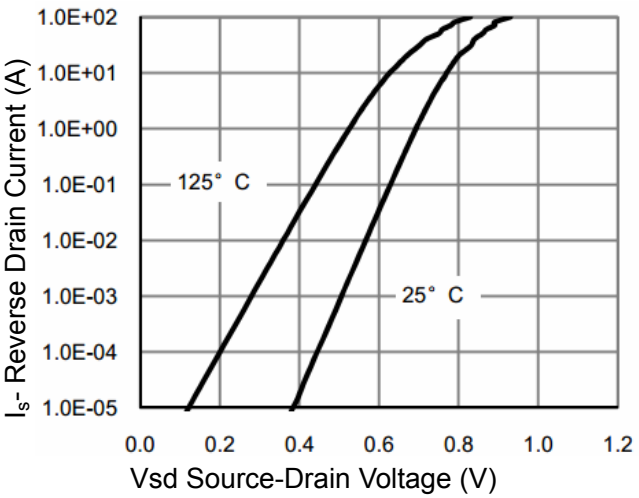


Figure 6 Source- Drain Diode Forward

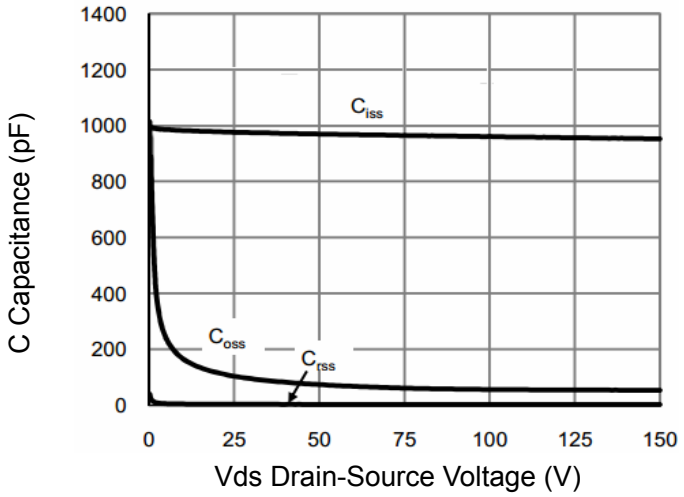


Figure 7 Capacitance vs Vds

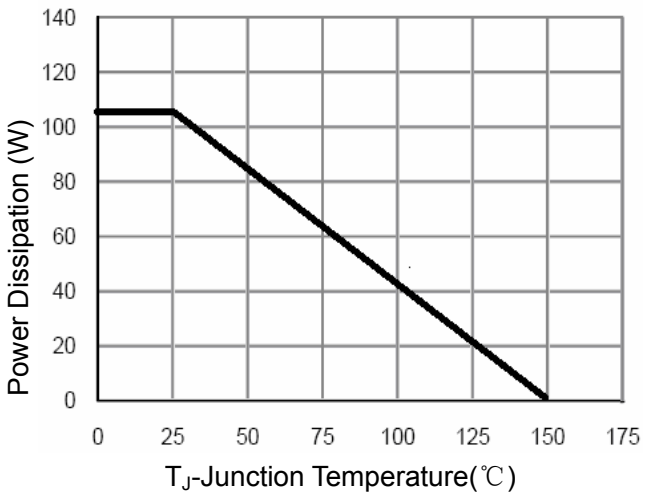


Figure 9 Power De-rating

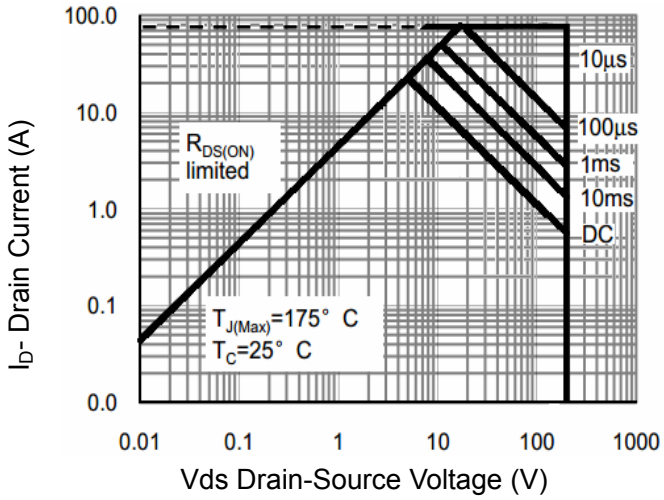


Figure 8 Safe Operation Area

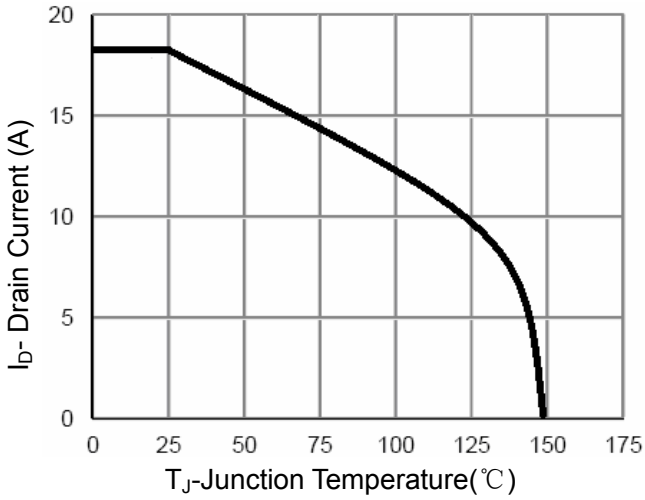


Figure 10 Current De-rating

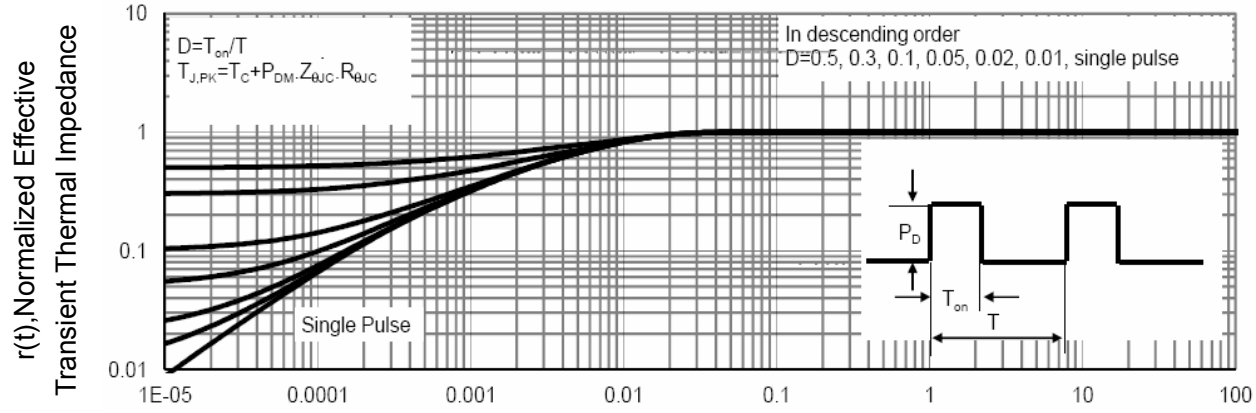
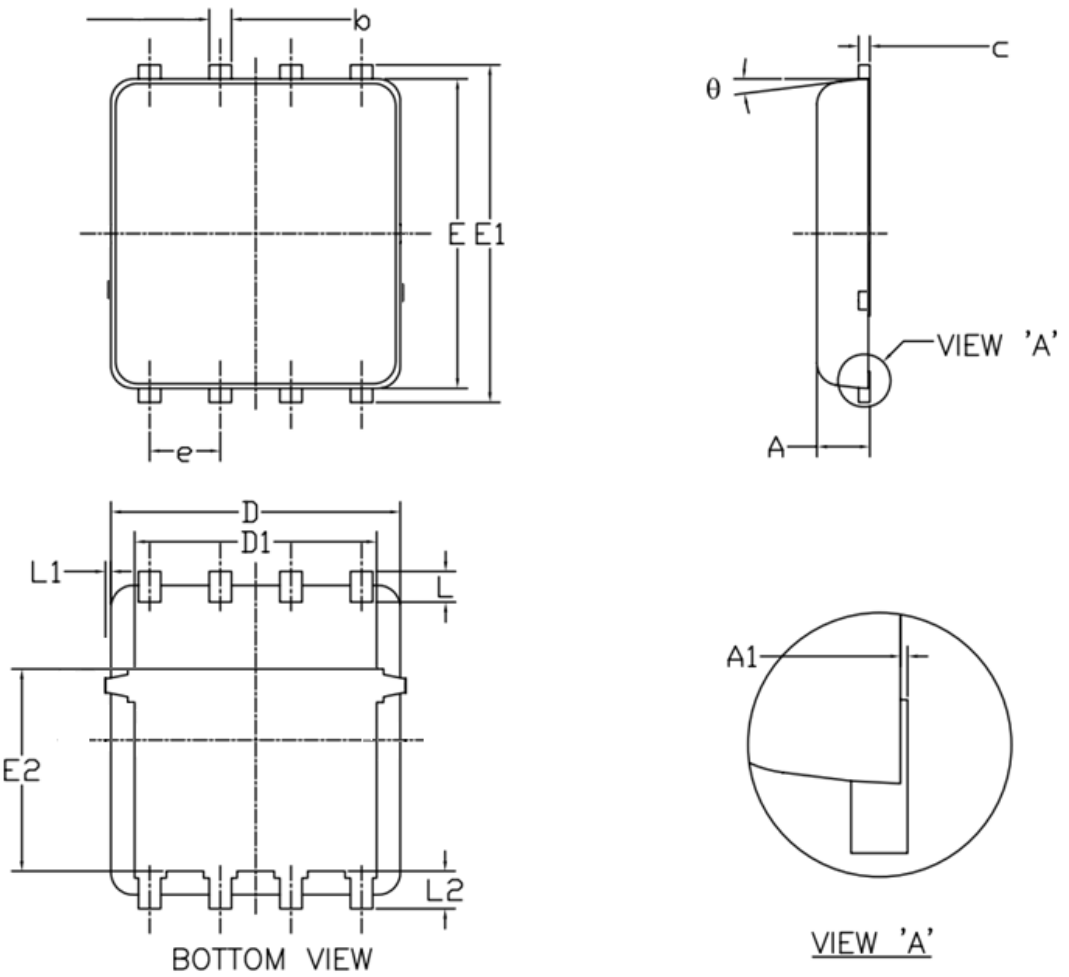


Figure 11 Normalized Maximum Transient Thermal Impedance

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°