AT10390T

100V N-Channel MOSFET

Features

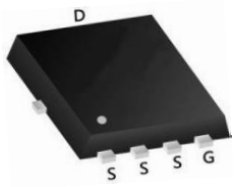
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

Product Summary

V_{DS}	100	V
I_D	39	A
$R_{DS(ON)}$ (at V_{GS}=10V)	12	mΩ
$R_{DS(ON)}$ (at V_{GS}=4.5V)	17.2	mΩ

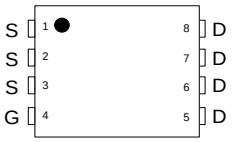
Applications

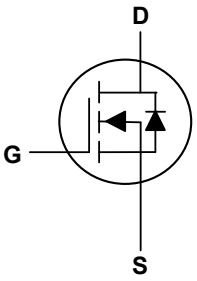
- High Frequency Point-of-Load,Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch



DFN5X6-8L Top View

Top View





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

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[1]	T_C=25℃	I_D	39	A
Continuous Drain Current[1]	T_C=100℃	I_D	24	A
Pulsed Drain Current[2]		I_{DM}	96	A
Single Pulse Avalanche Energy[3]		EAS	49	mJ
Avalanche Current		I_{AS}	14	A
Total Power Dissipation[4]	T_C=25℃	P_D	36	W
Total Power Dissipation[4]	T_C=100℃	P_D	14	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]	$R_{\theta JA}$	---	62.5	℃/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	---	3.5	℃/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	100	---	---	V
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	V_{GS}=10V , I_D=20A	---	10	12	mΩ
		V_{GS}=4.5V , I_D=10A	---	13.3	17.2	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	1	---	3	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=80V, V_{GS}=0V, T_J=25℃	---	---	1	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Total Gate Charge	Q_g	V_{DS}=50V , V_{GS}=10V , I_D=20A	---	30	---	nC
Gate-Source Charge	Q_{gs}		---	7.5	---	
Gate-Drain Charge	Q_{gd}		---	5.8	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=50V , V_{GS}=10V , R_G=4.5Ω, R_L=2.5Ω, I_D=20A	---	8.8	---	ns
Rise Time	T_r		---	26.5	---	
Turn-Off Delay Time	$T_{d(off)}$		---	23.5	---	
Fall Time	T_f		---	22	---	
Input Capacitance	C_{iss}	V_{DS}=50V , V_{GS}=0V , f=1MHz	---	1620	---	pF
Output Capacitance	C_{oss}		---	252	---	
Reverse Transfer Capacitance	C_{rss}		---	22	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[1,5]	I_S	T_C=25℃	---	---	20	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=20A , T_J=25℃	---	---	1.3	V
Reverse Recovery Time	t_{rr}	I_F=20A ,di/dt=100A/μs, T_J=25℃	---	57	---	nS
Reverse Recovery Charge	Q_{rr}		---	76	---	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

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

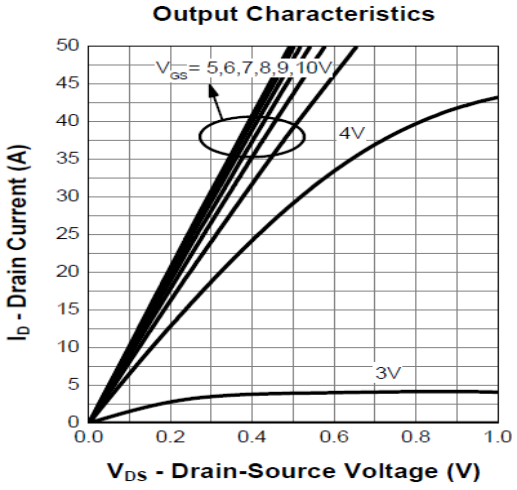


Figure 1. Output Characteristics

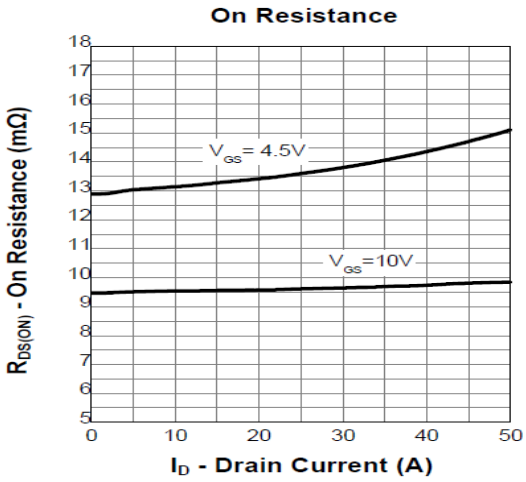


Figure 2. On−Resistance vs. I_D

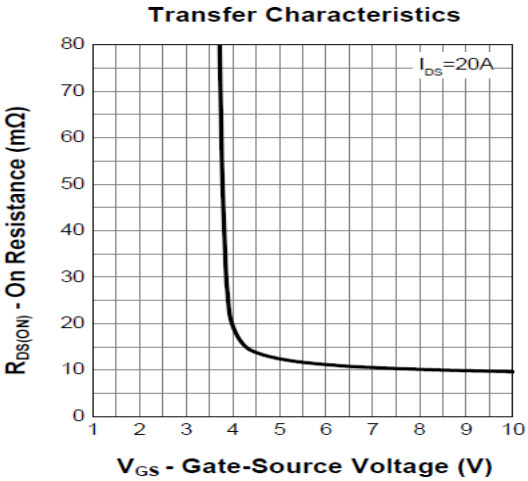


Figure 3. On−Resistance vs. V_{GS}

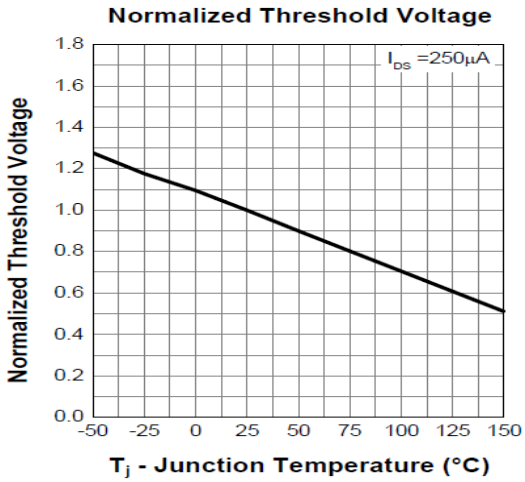


Figure 4. Gate Threshold Voltage

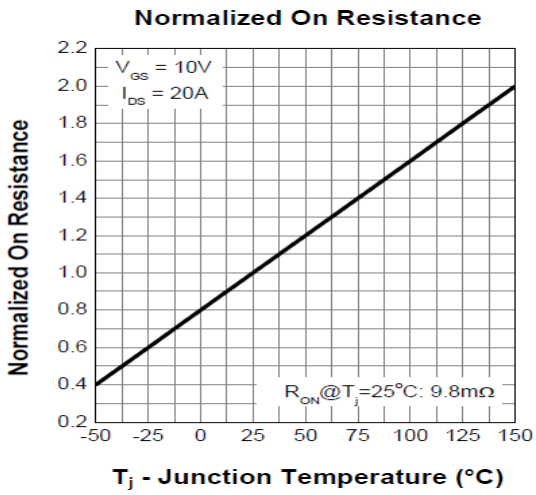


Figure 5. Drain-Source On Resistance

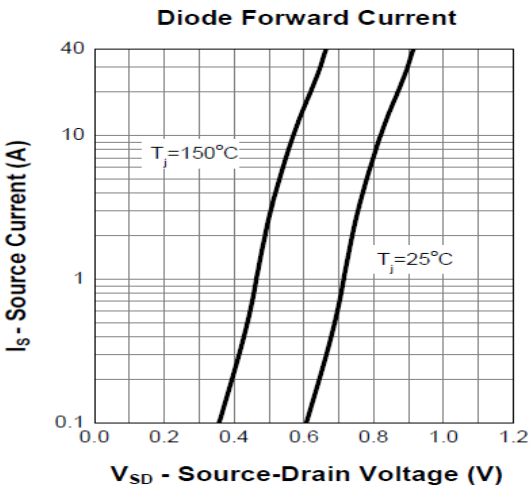


Figure 6. Source-Drain Diode Forward

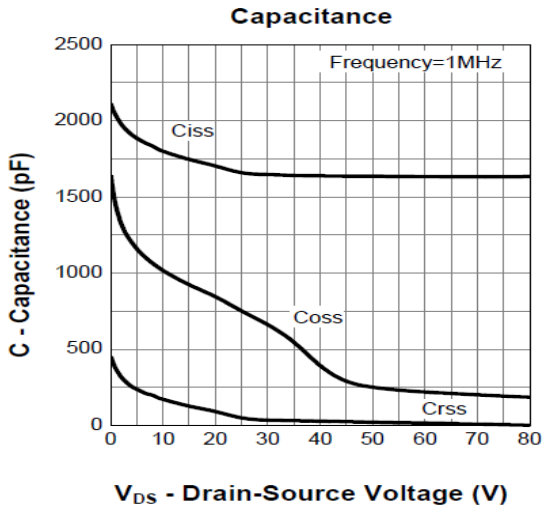


Figure 7. Capacitance

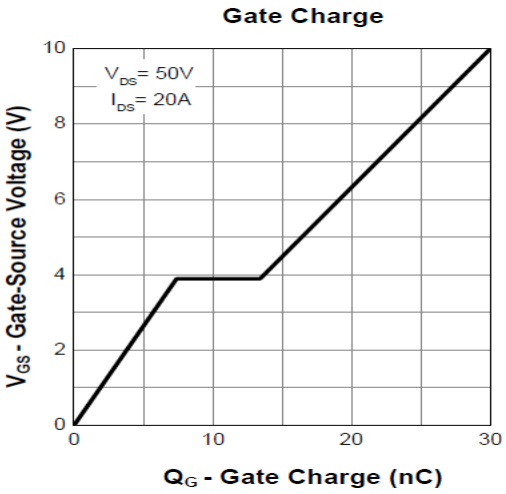


Figure 8. Gate Charge Characteristics

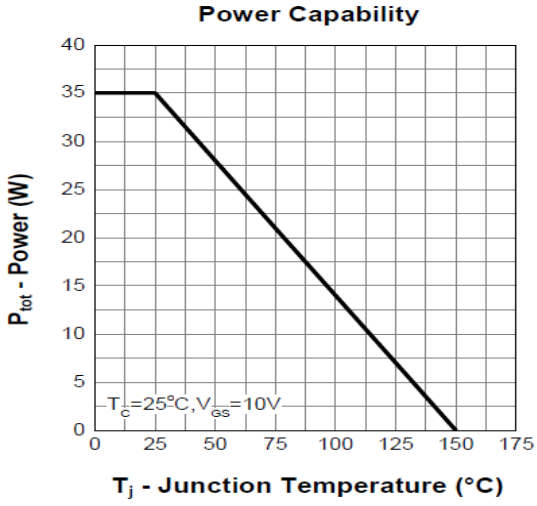


Figure 9. Power Dissipation

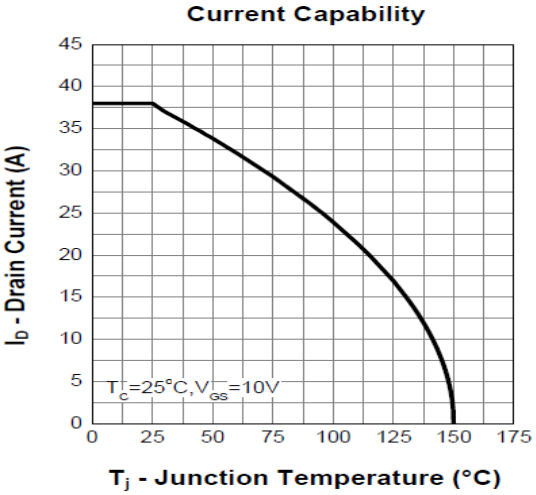


Figure 10. Drain Current

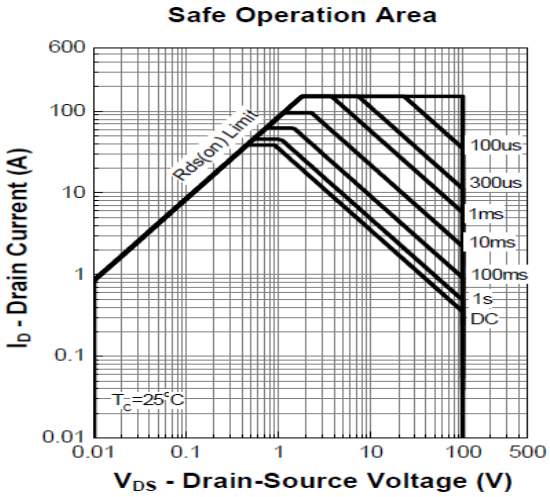


Figure 11. Safe Operating Area

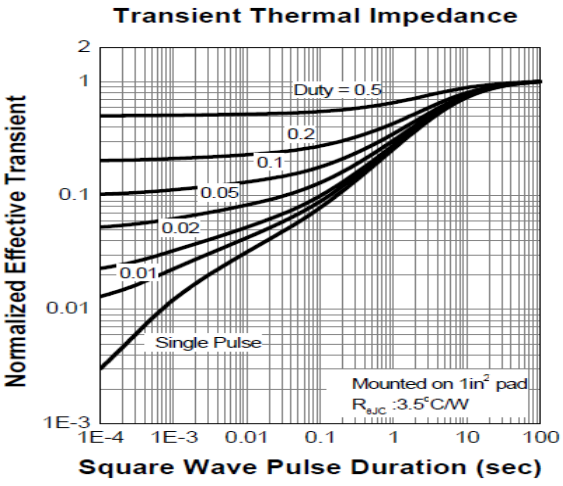
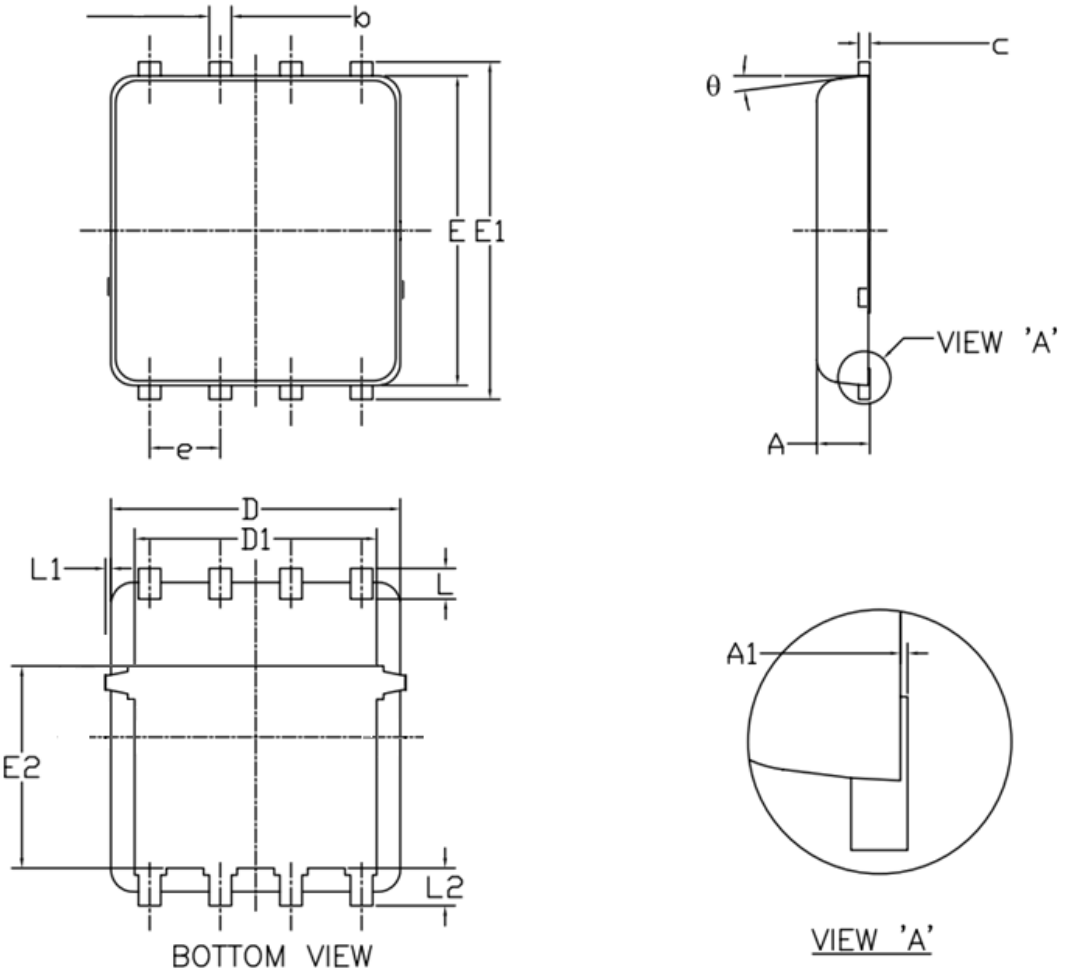


Figure 12. $R_{\theta JC}$ Transient Thermal Impedance

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°