AT04N80AT

40V N-Channel MOSFET

Features

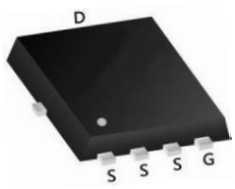
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

Product Summary

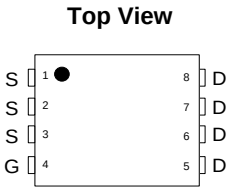
V_{DS}	40	V
I_D	80	A
$R_{DS(ON)}$ (at V_{GS}=10V)	4.5	mΩ
$R_{DS(ON)}$ (at V_{GS}=4.5V)	5.5	mΩ

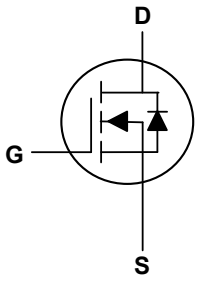
Applications

- 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
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[1]	I_D@T_C=25℃	80	A
Continuous Drain Current[1]	I_D@T_C=100℃	51	A
Pulsed Drain Current[2]	I_{DM}	320	A
Single Pulse Avalanche Energy[3]	E_{AS}	121	mJ
Total Power Dissipation[4]	P_D	65	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]	$R_{\theta JA}$	---	30	℃/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	---	1.92	℃/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	40	---	---	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V , I_D=50A	---	3.5	4.5	mΩ
		V_{GS}=4.5V , I_D=35A	---	4.5	5.5	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	1.0	---	2.5	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=40V , 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}=32V , V_{GS}=10V , I_D=50A	---	28	---	nC
Gate-Source Charge	Q_{gs}		---	5	---	
Gate-Drain Charge	Q_{gd}		---	9	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=20V , V_{GS}=10V , R_G=4.7Ω, I_D=50A	---	13	---	ns
Rise Time	T_r		---	21	---	
Turn-Off Delay Time	$T_{d(off)}$		---	29	---	
Fall Time	T_f		---	9	---	
Input Capacitance	C_{iss}	V_{DS}=20V , V_{GS}=0V , f=1MHz	---	1560	---	pF
Output Capacitance	C_{oss}		---	780	---	
Reverse Transfer Capacitance	C_{rss}		---	80	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=50A , T_J=25℃	---	---	1.2	V
Reverse recovery time	t_{rr}	Is=50A, diF/dt=100A/μs	---	18	---	ns
Reverse recovery charge	Q_{rr}		---	29	---	nC

Note:

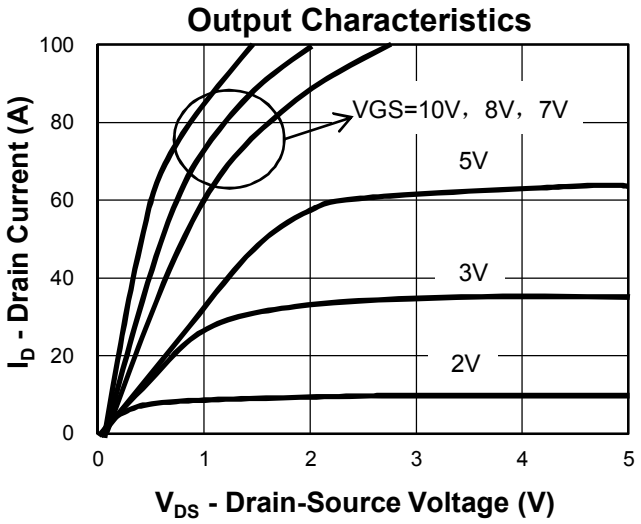
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.

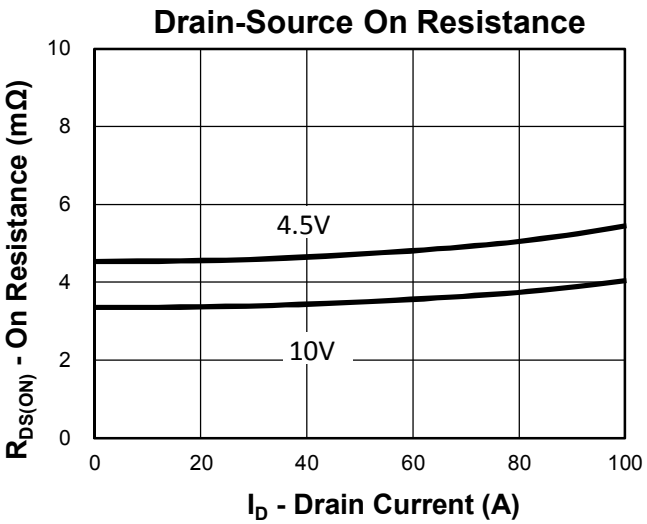
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

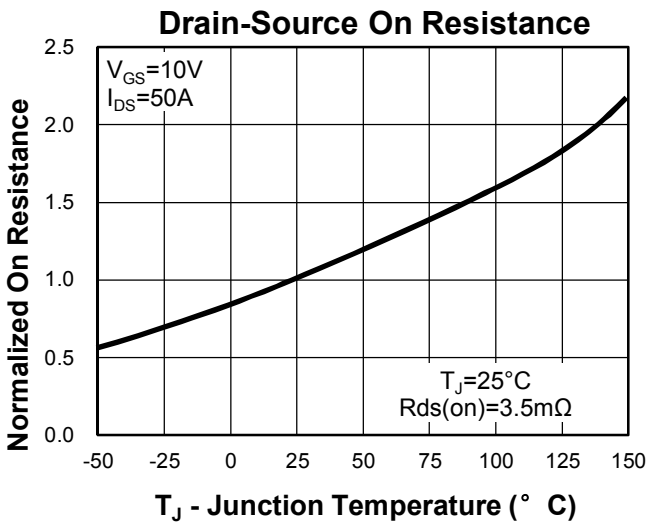
3.The EAS data shows Max. rating . The test condition is V_{DD}=24V,V_{GS}=10V

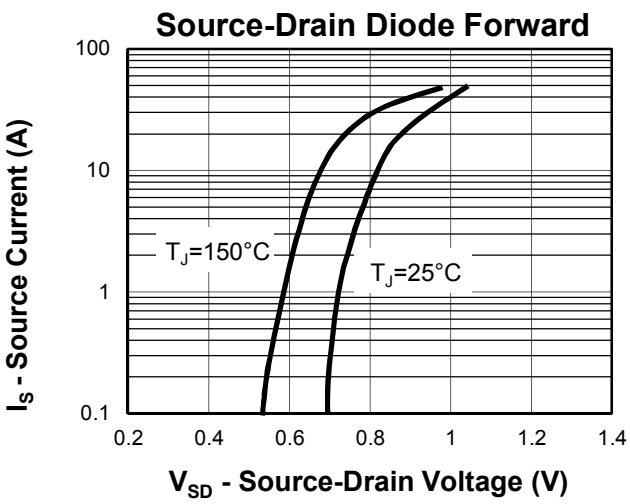
4.The power dissipation is limited by 150℃ junction temperature

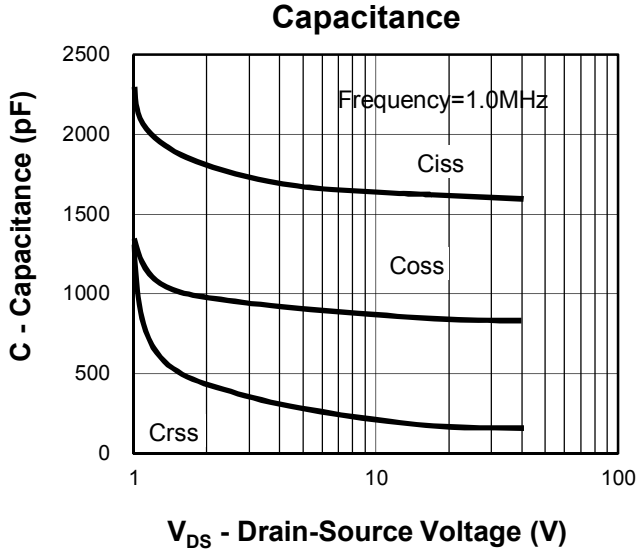
Typical Characteristics

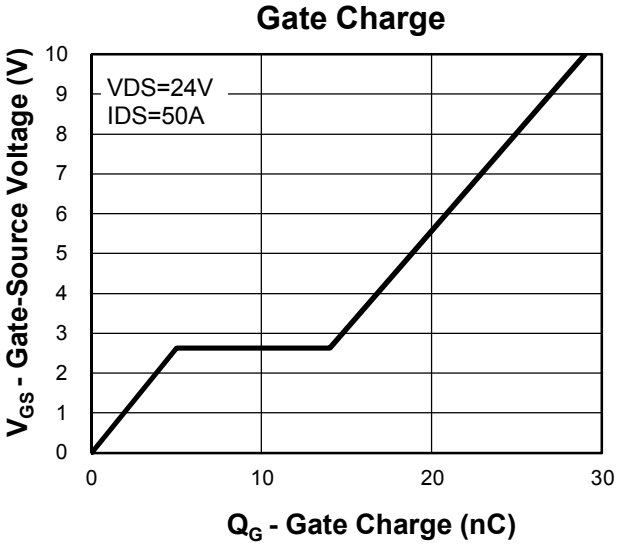


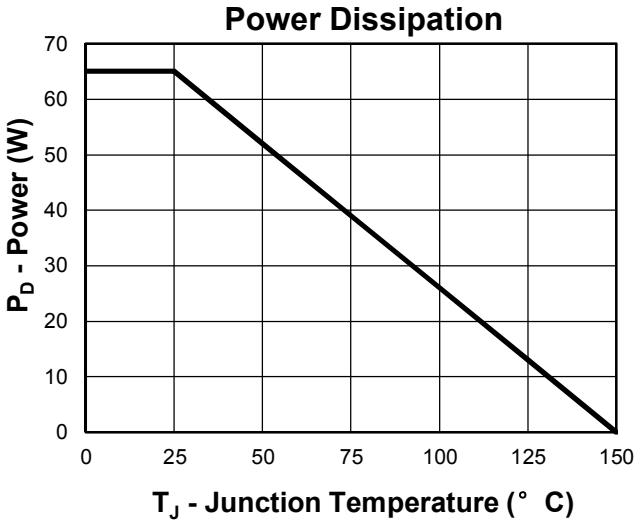


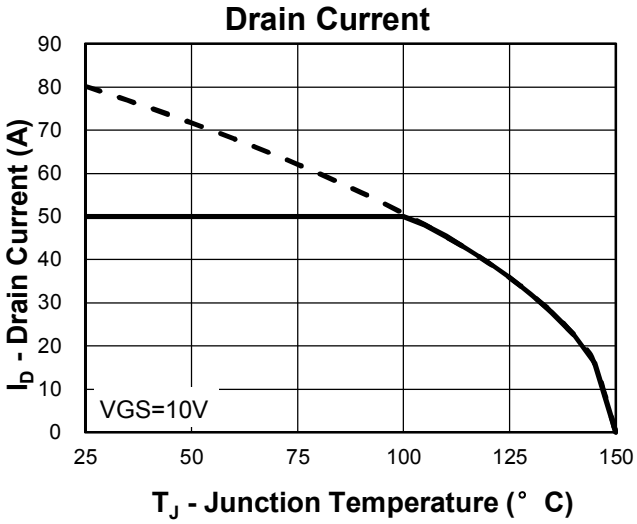


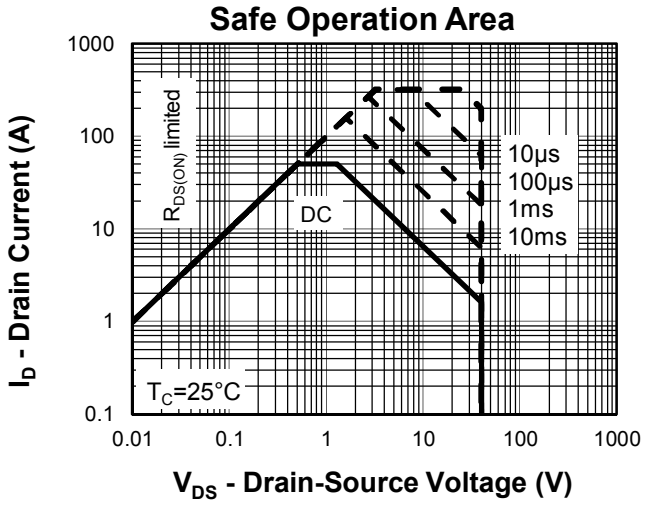


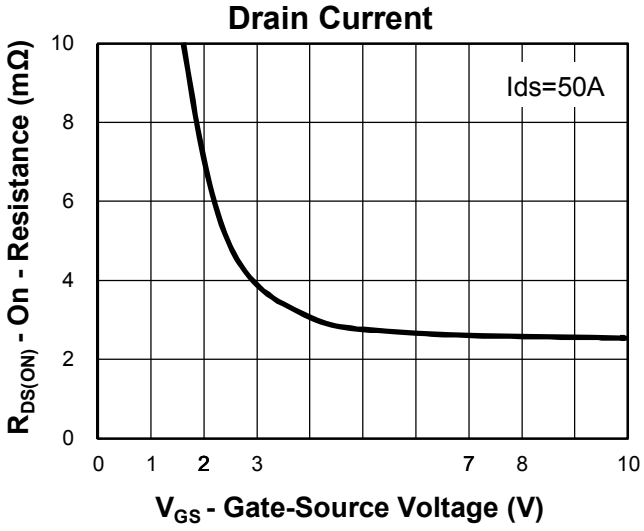


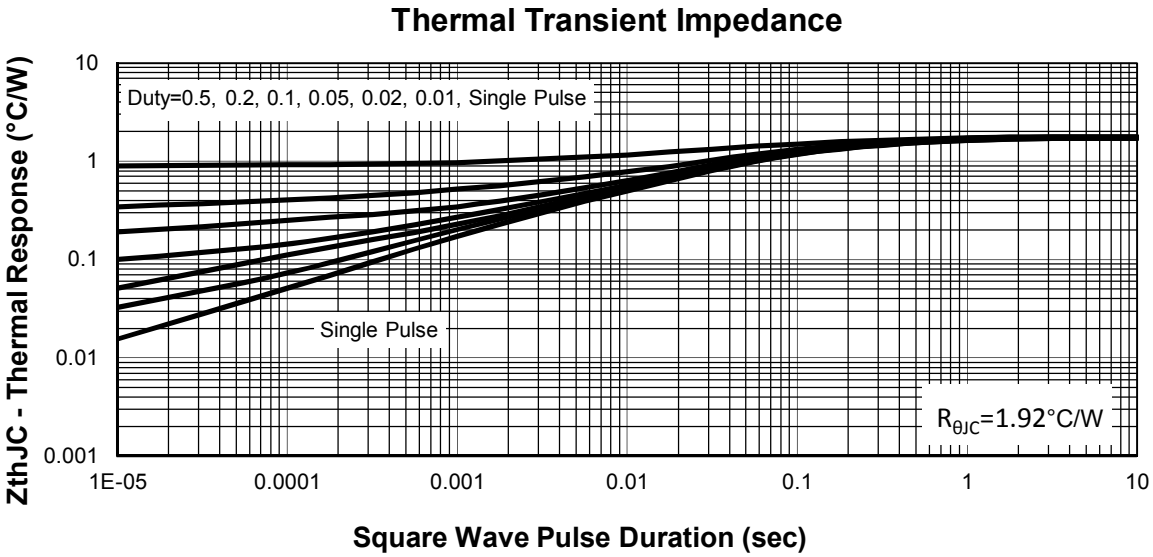



Power Dissipation
P_D - Power (W)
70
60
50
40
30
20
10
0
0
25
50
75
100
125
150
T_J - Junction Temperature (° C)

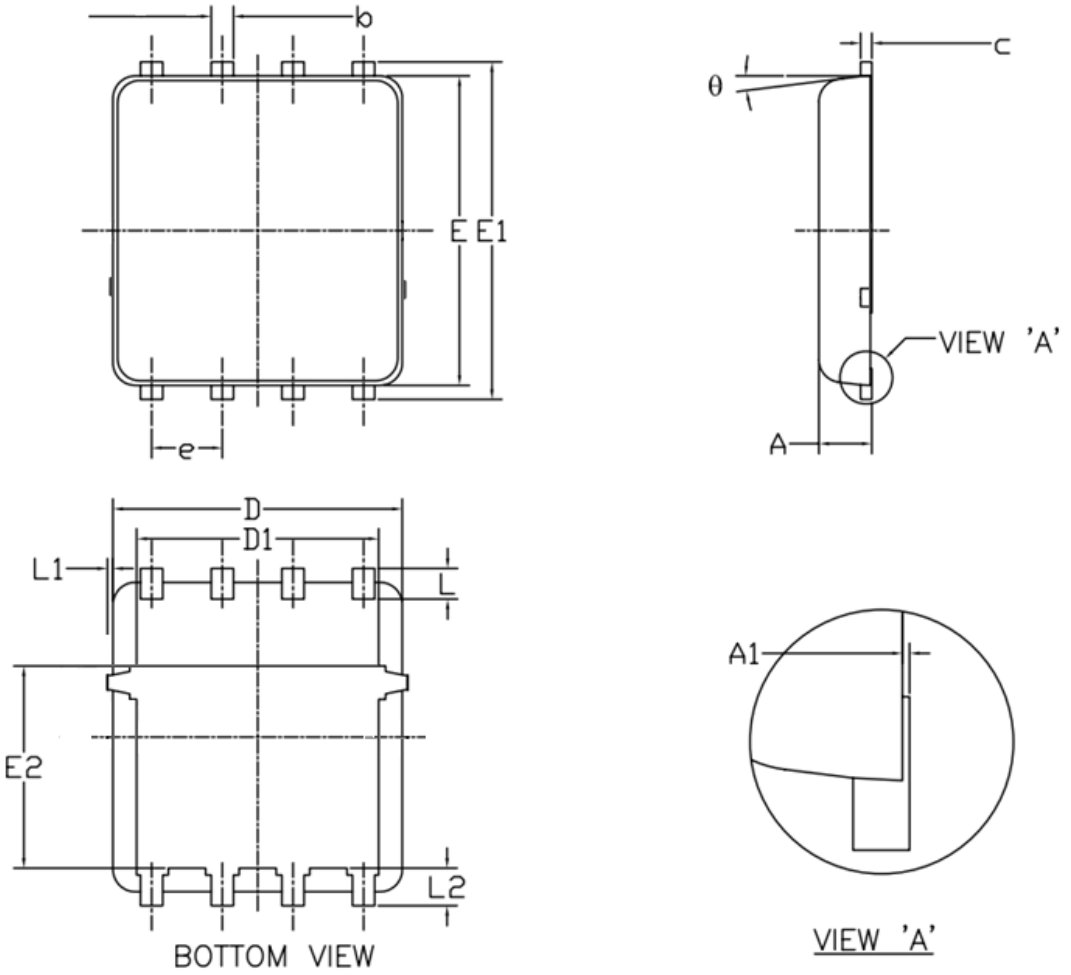

Drain Current
I_D - Drain Current (A)
90
80
70
60
50
40
30
20
10
0
VGS=10V
25
50
75
100
125
150
T_J - Junction Temperature (° C)


Safe Operation Area
I_D - Drain Current (A)
1000
100
10
1
0.1
$R_{DS(ON)}$ limited
DC
10µs
100µs
1ms
10ms
T_C=25°C
0.01
0.1
1
10
100
1000
V_{DS} - Drain-Source Voltage (V)


Drain Current
$R_{DS(ON)}$ - On - Resistance (mΩ)
10
8
6
4
2
0
Ids=50A
0
1
2
3
7
8
10
V_{GS} - Gate-Source Voltage (V)


Thermal Transient Impedance
ZthJC - Thermal Response (°C/W)
10
1
0.1
0.01
0.001
Duty=0.5, 0.2, 0.1, 0.05, 0.02, 0.01, Single Pulse
Single Pulse
$R_{\theta JC}$=1.92°C/W
1E-05
0.0001
0.001
0.01
0.1
1
10
Square Wave Pulse Duration (sec)

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°

Printing Information

ATC ====Brand

XXXXXXX ====Material Code

XXYY ====XX Representative Year
YY Representative Weeks