AP04230R

40V P-Channel MOSFET

Features

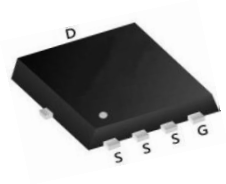
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

Product Summary

V_{DS}	-40	V
I_D	-23	A
$R_{DS(ON)}$ (at V_{GS}=-10V)	20	mΩ
$R_{DS(ON)}$ (at V_{GS}=-4.5V)	30	mΩ

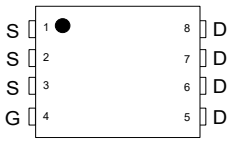
Applications

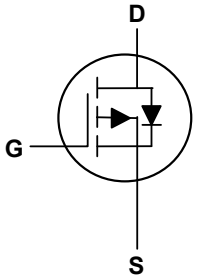
- High Frequency Point-of-Load,Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch



DFN3X3-8L Top View

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℃	-23	A
Continuous Drain Current[1]	I_D@T_C=70℃	-18	A
Pulsed Drain Current[2]	I_{DM}	-92	A
Single Pulse Avalanche Energy[3]	E_{AS}	150	mJ
Total Power Dissipation[4]	P_D@T_C=25℃	32	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]	$R_{\theta JC}$	---	4.5	℃/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	-40	---	---	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V , I_D=-12A	---	14	20	mΩ
		V_{GS}=-4.5V , I_D=-12A	---	20	30	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =-250uA	-1.2	-1.6	-2.3	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
Forward Transconductance	gfs	V_{DS}=-15V , I_D=-12A	30	---	---	S
Total Gate Charge	Q_g	V_{DS}=-20V , V_{GS}=-10V , I_D=-12A	---	76	---	nC
Gate-Source Charge	Q_{gs}		---	18	---	
Gate-Drain Charge	Q_{gd}		---	19	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DS}=-20V , V_{GS}=-10V , R_G=3Ω, I_D=-12A	---	12	---	ns
Rise Time	T_r		---	21	---	
Turn-Off Delay Time	$T_{d(off)}$		---	45	---	
Fall Time	T_f		---	27	---	
Input Capacitance	C_{iss}	V_{DS}=-20V , V_{GS}=0V , f=1MHz	---	3180	---	pF
Output Capacitance	C_{oss}		---	370	---	
Reverse Transfer Capacitance	C_{rss}		---	290	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[1]	I_S		---	---	-23	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=-12A , T_J=25℃	---	---	-1.2	V

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}=-20V,V_{GS}=-10V,L=1mH

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

Typical Characteristics

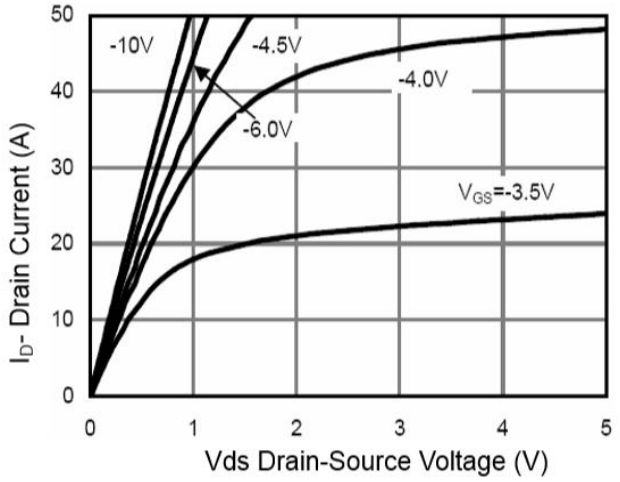


Figure 1 Output Characteristics

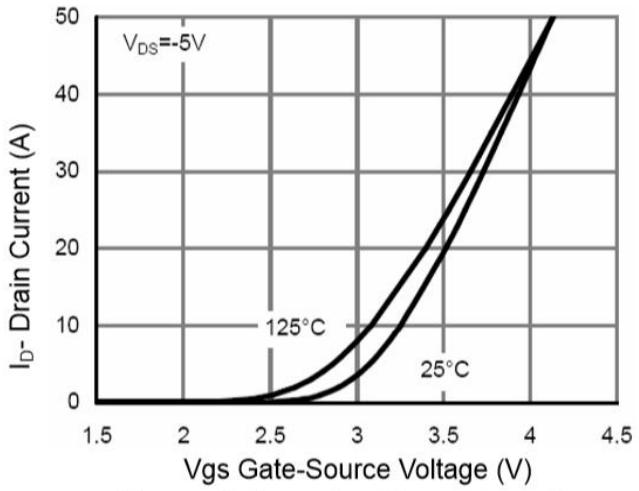


Figure 2 Transfer Characteristics

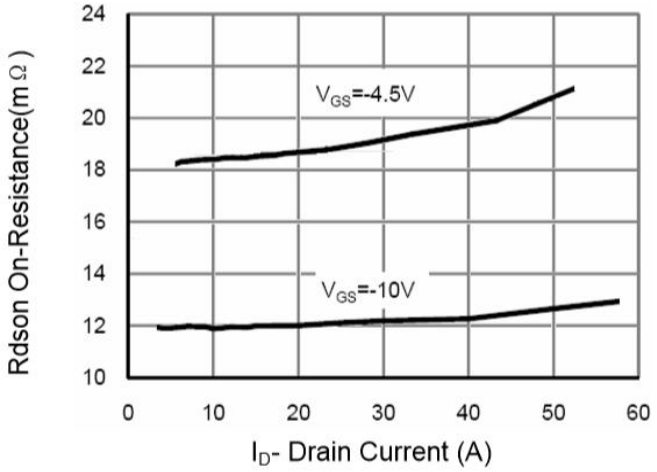


Figure 3 Rdson- Drain Current

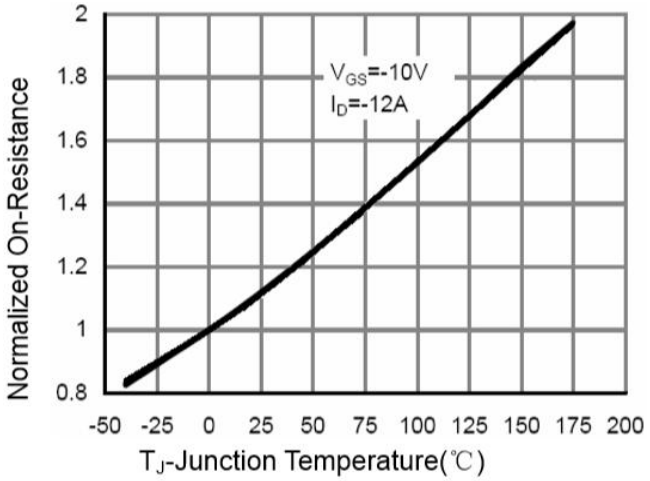


Figure 4 Rdson-Junction Temperature

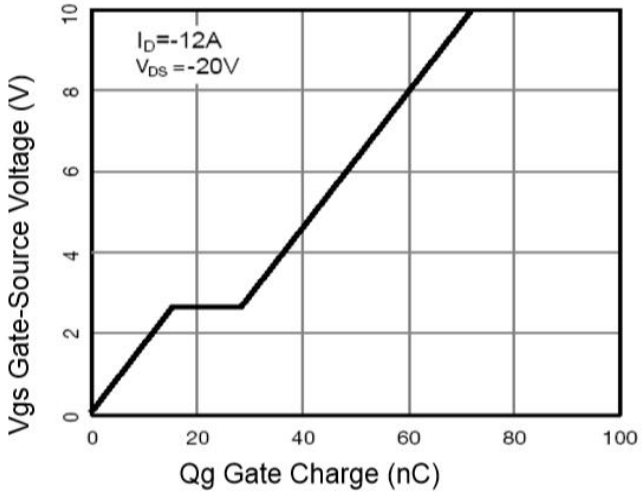


Figure 5 Gate Charge

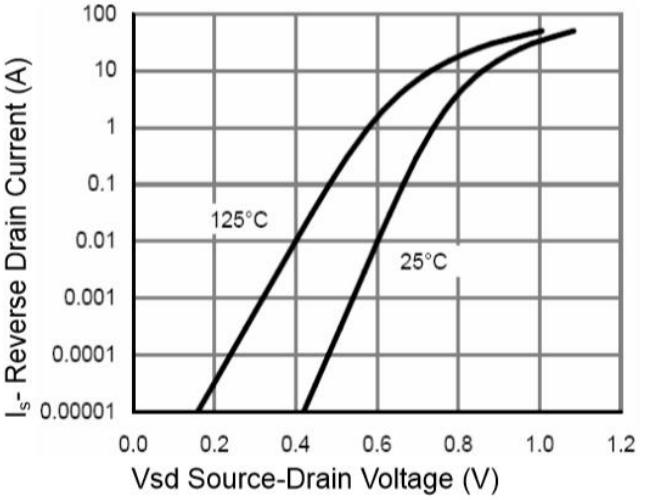


Figure 6 Source- Drain Diode Forward

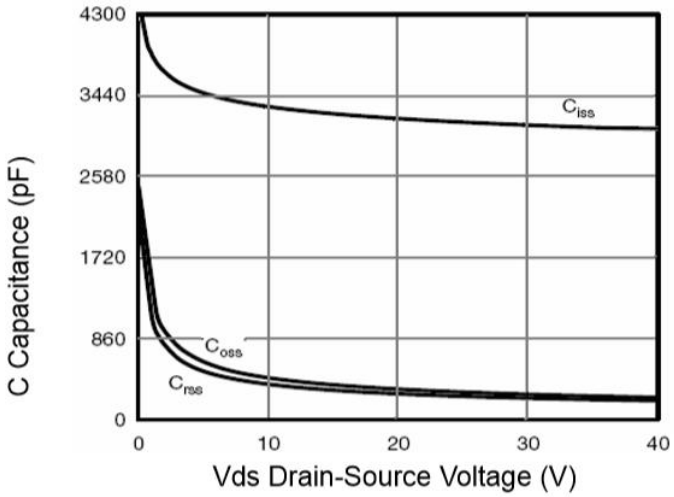


Figure 7 Capacitance vs Vds

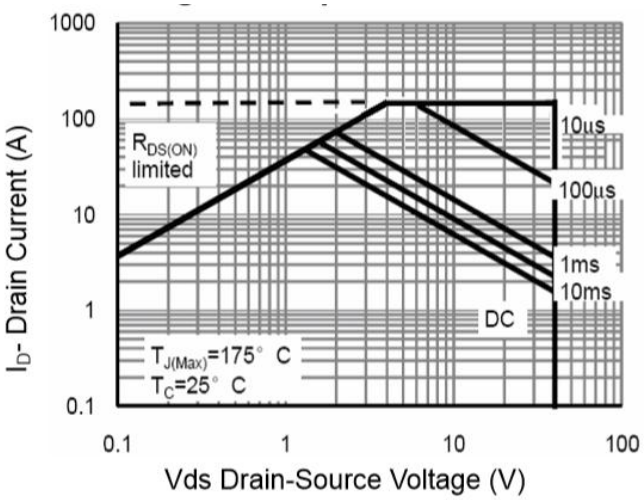


Figure 8 Safe Operation Area

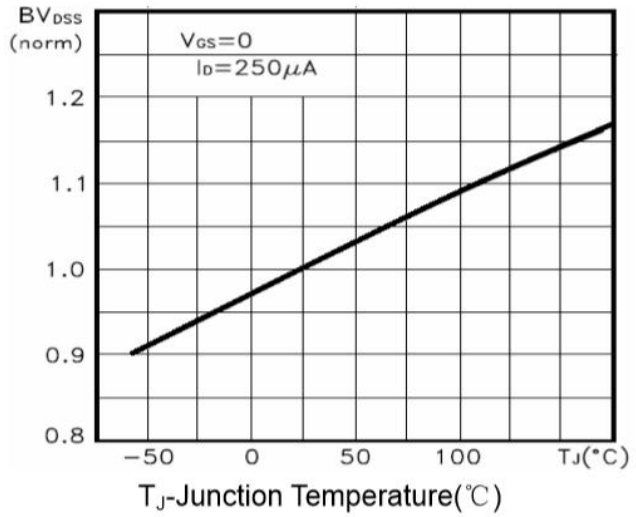
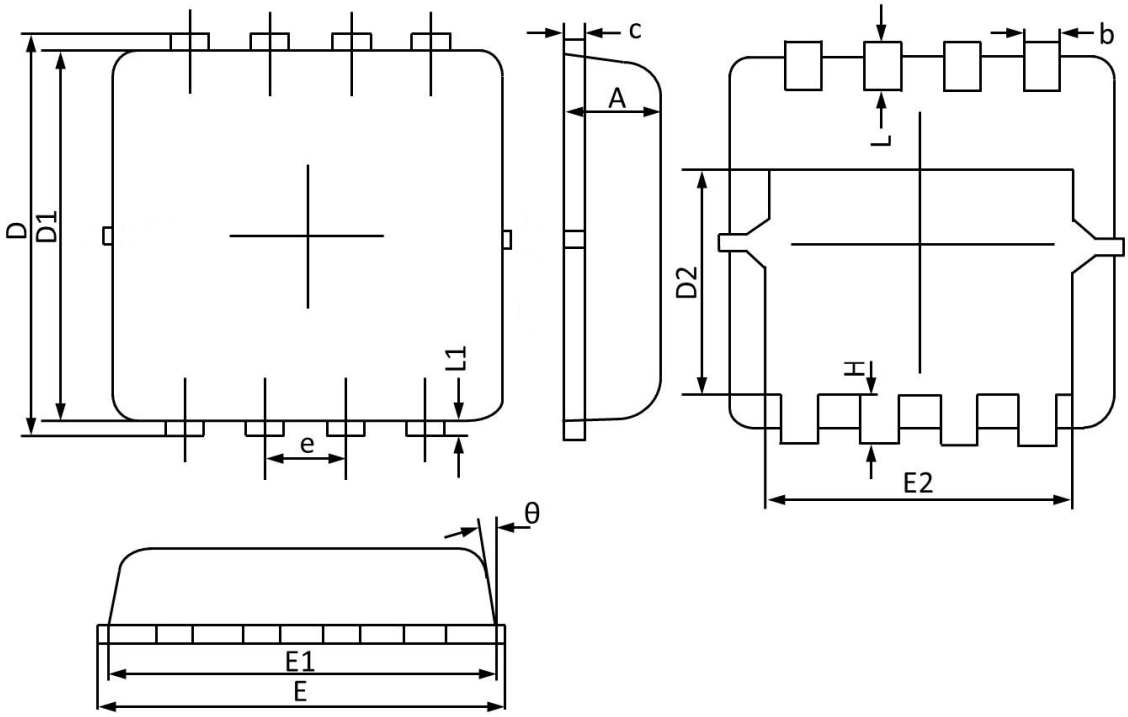


Figure 9 BV_{DSS} vs Junction Temperature

DFN3X3-8L Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	0.70	0.75	0.85	E1	2.90	3.10	3.25
b	0.24	0.30	0.35	E2	2.35	2.50	2.60
c	0.10	0.17	0.25	e	0.65 BSC		
D	3.10	3.30	3.45	H	0.30	0.40	0.50
D1	2.90	3.05	3.20	L	0.30	0.40	0.50
D2	1.45	1.70	1.95	L1	--	0.13	--
E	3.05	3.25	3.40	θ	0°		14°