AP04800K

40V P-Channel MOSFET

Features

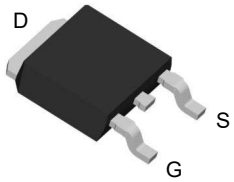
- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

Product Summary

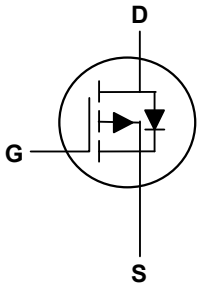
V_{DS}	-40	V
I_D	-80	A
$R_{DS(ON)}$ (at V_{GS}=-10V)	6.2	mΩ
$R_{DS(ON)}$ (at V_{GS}=-4.5V)	9.1	mΩ

Applications

- High Frequency Point-of-Load,Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch



TO-252 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	I_D@T_C=25℃	-80	A
Continuous Drain Current	I_D@T_C=100℃	-56.5	A
Pulsed Drain Current[2]	I_{DM}	-320	A
Single Pulse Avalanche Energy[3]	EAS	500	mJ
Total Power Dissipation	P_D@T_C=25℃	150	W
Derating factor		1	W/℃
Storage Temperature Range	T_{STG}	-55 to 175	℃
Operating Junction Temperature Range	T_J	-55 to 175	℃

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	---	1	℃/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[2]	$R_{DS(ON)}$	V_{GS}=-10V , I_D=-20A	---	5.6	6.2	mΩ
		V_{GS}=-4.5V , I_D=-20A	---	7.6	9.1	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =-250uA	-0.8	-1.2	-1.8	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-40V , V_{GS}=0V , T_J=25℃	---	---	-1	uA
		V_{DS}=-40V , V_{GS}=0V , T_J=55℃	---	---	-5	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Forward Transconductance	gfs	V_{DS}=-5V , I_D=-20A	---	30	---	S
Total Gate Charge	Q_g	V_{DS}=-20V , V_{GS}=-10V , I_D=-20A	---	57.2	---	nC
Gate-Source Charge	Q_{gs}		---	9.8	---	
Gate-Drain Charge	Q_{gd}		---	7.3	---	
Turn-On Delay Time	$T_{d(on)}$	V_{DD}=-20V , V_{GS}=-10V , I_D=-20A, R_G=1.6Ω	---	10.5	---	ns
Rise Time	T_r		---	4	---	
Turn-Off Delay Time	$T_{d(off)}$		---	35	---	
Fall Time	T_f		---	5	---	
Input Capacitance	C_{iss}	V_{DS}=-20V , V_{GS}=0V , f=1MHz	---	3738	---	pF
Output Capacitance	C_{oss}		---	882	---	
Reverse Transfer Capacitance	C_{rss}		---	22	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[1]	I_S		---	---	-80	A
Diode Forward Voltage[2]	V_{SD}	V_{GS}=0V , I_S=-20A , T_J=25℃	---	---	-1.2	V
Reverse Recovery Time	t_{rr}	I_F=20A ,di/dt=100A/μs, T_J=25℃	---	---	24	nS
Reverse Recovery Charge	Q_{rr}		---	---	68	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}=-20V,V_{GS}=-10V,L=0.5mH,R_G=25Ω

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

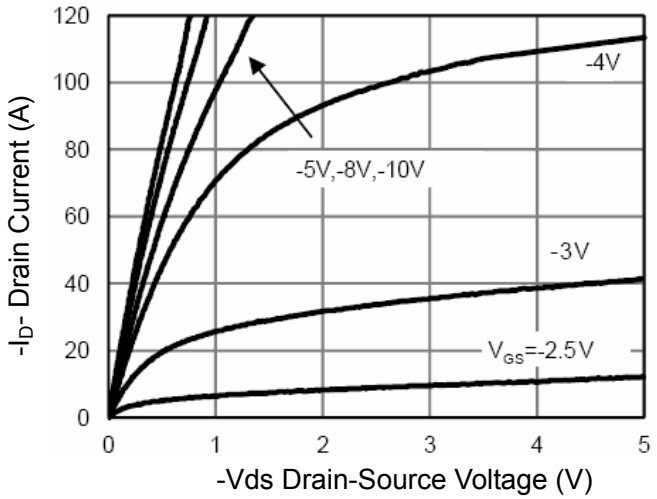


Figure 1 Output Characteristics

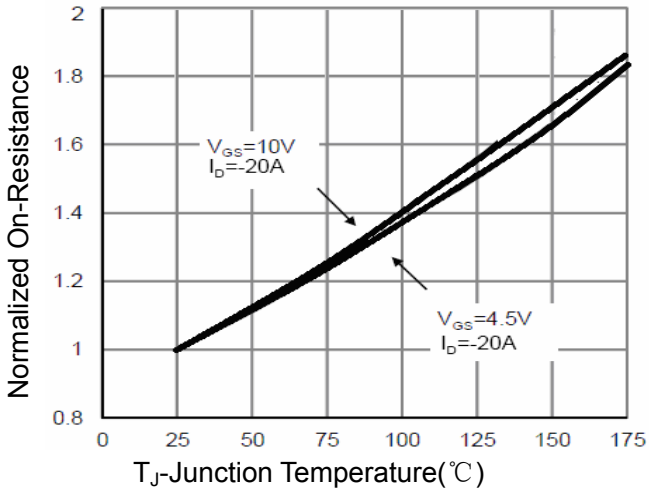


Figure 4 Rdson-JunctionTemperature

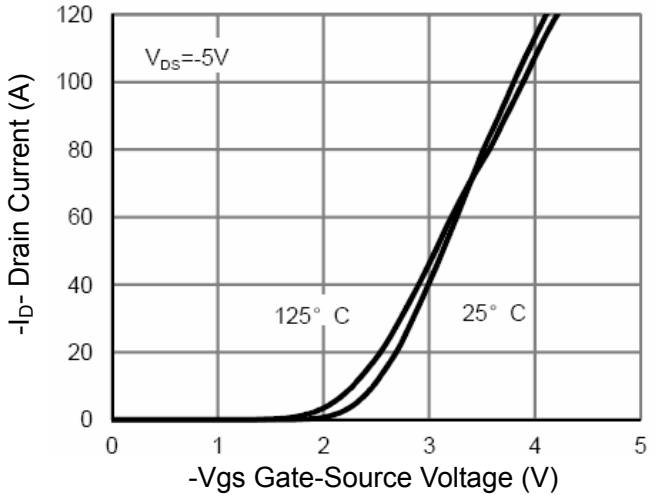


Figure 2 Transfer Characteristics

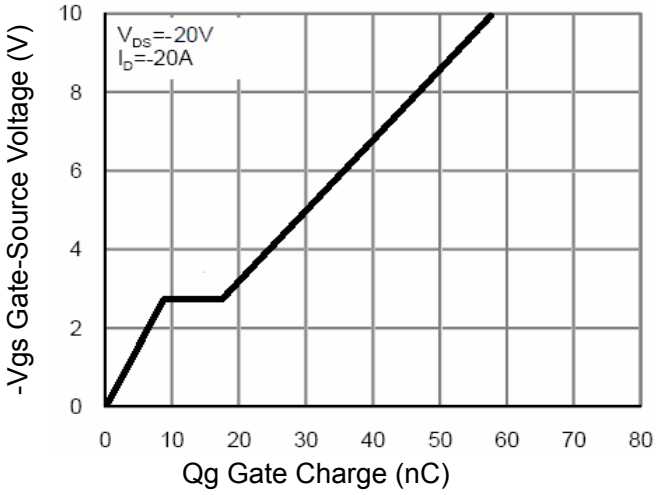


Figure 5 Gate Charge

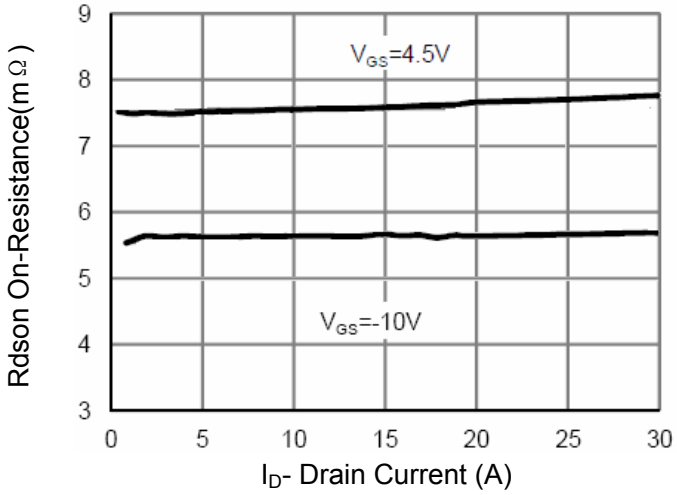


Figure 3 Rdson- Drain Current

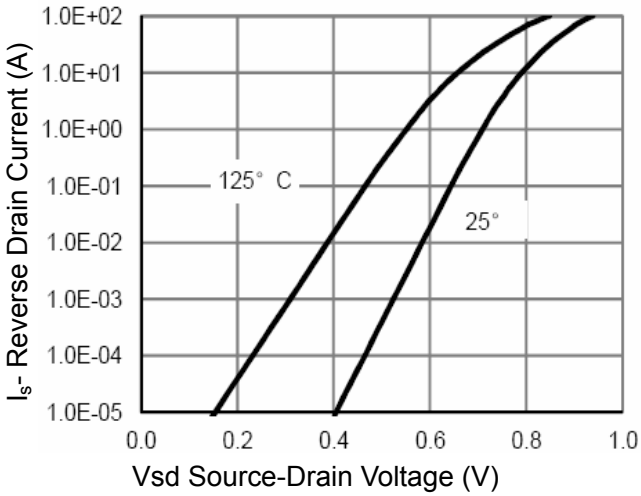


Figure 6 Source- Drain Diode Forward

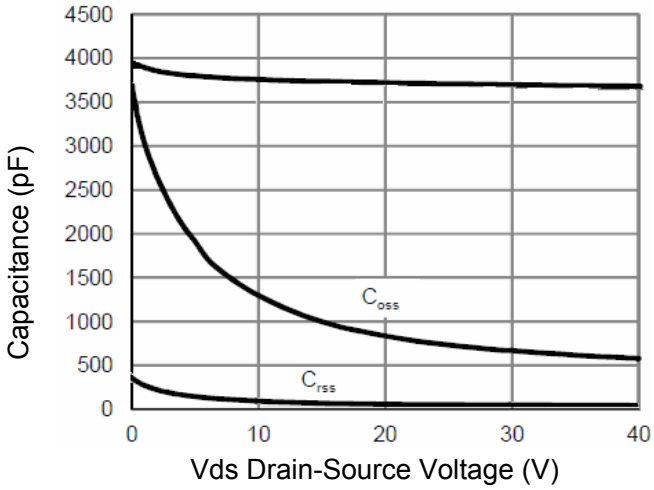


Figure 7 Capacitance vs Vds

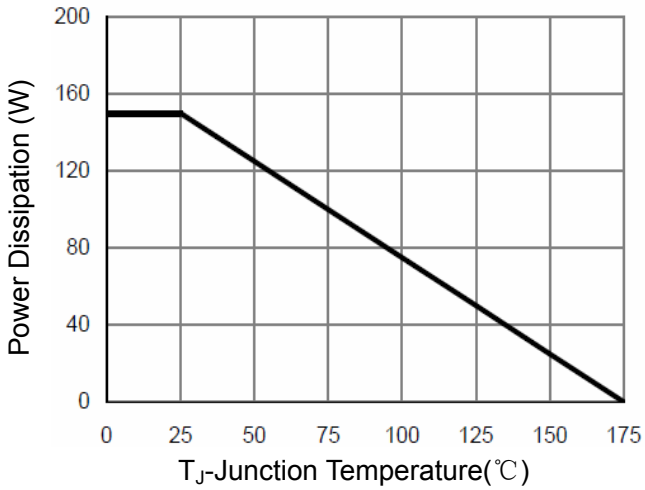


Figure 9 Power De-rating

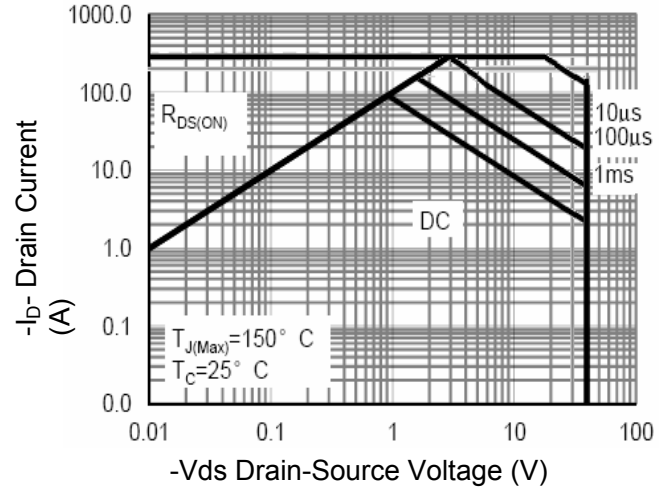


Figure 8 Safe Operation Area

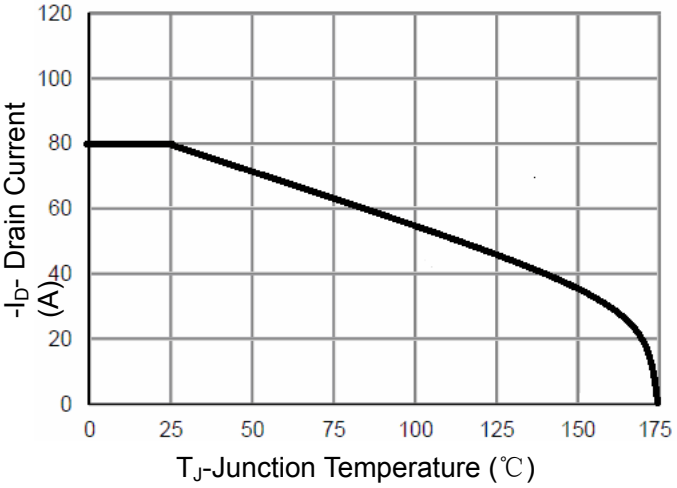


Figure 10 Current De-rating

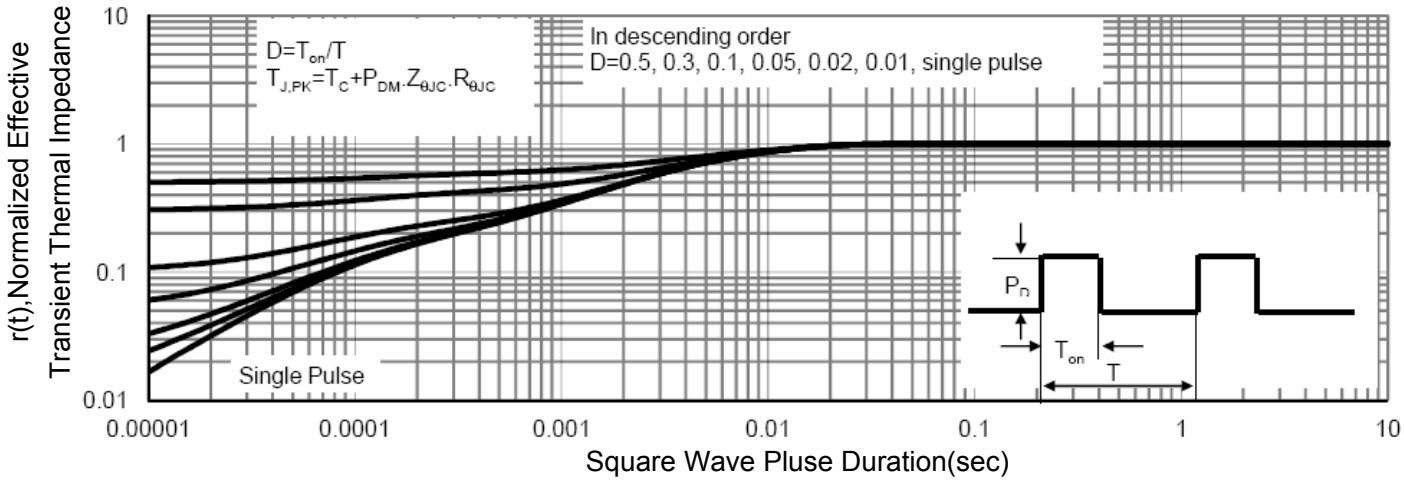
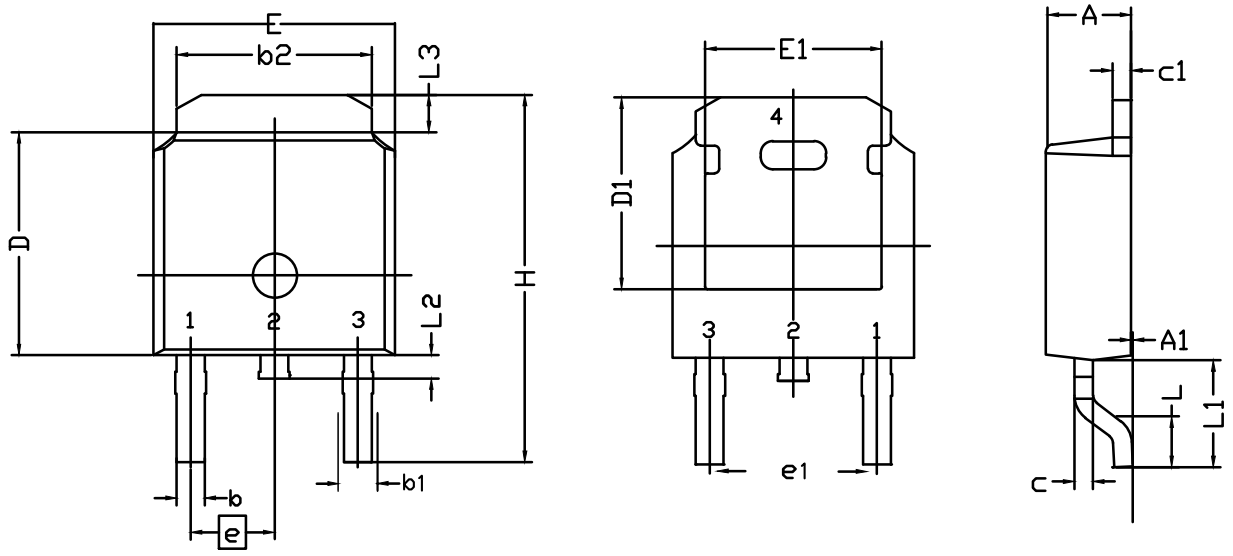


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-252 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	2.20	2.30	2.38	E	6.40	6.60	6.731
A_1	0.00	0.10	0.20	E_1	4.40	--	--
b	0.64	0.76	0.89	e	2.286 BSC		
b_1	0.77	0.85	1.14	e_1	4.572 BSC		
b_2	5.00	5.33	5.46	H	9.40	10.00	10.40
c	0.458	0.508	0.610	L	1.40	1.52	1.77
C_1	0.458	0.508	0.620	L_1	--	2.743	--
D	5.98	6.10	6.223	L_2	0.60	0.80	1.01
D_1	5.20	5.25	5.38	L_3	0.90	1.06	1.25