AP03041XA

30V 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

Applications

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

Product Summary

V_{DS}	-30	V
I_D	-4.1	A
$R_{DS(ON)}$ (at V_{GS}=-10V)	65	mΩ
$R_{DS(ON)}$ (at V_{GS}=-4.5V)	75	mΩ

SOT23 Top View

Absolute Maximum Ratings(T$_C$=25℃, unless otherwise noted)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current[1]	I_D@T$_C$=25℃	-4.1	A
Continuous Drain Current[1]	I_D@T$_C$=100℃	-2.6	A
Pulsed Drain Current[2]	I_{DM}	-16.4	A
Total Power Dissipation[4]	P_D	1.56	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]	$R_{θJA}$	---	80	℃/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	-30	---	---	V
Static Drain-Source On-Resistance	R$_{DS(ON)}$	V$_{GS}$=-10V , I$_D$=-4A	---	55	65	mΩ
		V$_{GS}$=-4.5V , I$_D$=-3A	---	65	75	mΩ
Gate Threshold Voltage	V$_{GS(th)}$	V$_{GS}$=V$_{DS}$, I$_D$ =-250uA	-0.4	---	-0.9	V
Drain-Source Leakage Current	I$_{DSS}$	V$_{DS}$=-30V, V$_{GS}$=0V	---	---	-1	uA
Gate-Source Leakage Current	I$_{GSS}$	V$_{GS}$=±12V , V$_{DS}$=0V	---	---	±100	nA
Total Gate Charge	Q$_g$	V$_{DS}$=-15V , V$_{GS}$=-4.5V , I$_D$=-4A	---	8	---	nC
Gate-Source Charge	Q$_{gs}$		---	1.9	---	
Gate-Drain Charge	Q$_{gd}$		---	1.4	---	
Turn-On Delay Time	T$_{d(on)}$	V$_{DS}$=-15V , V$_{GS}$=-10V , R$_G$=6Ω, I$_D$=-1A	---	5.4	---	ns
Rise Time	T$_r$		---	19.4	---	
Turn-Off Delay Time	T$_{d(off)}$		---	45.9	---	
Fall Time	T$_f$		---	12.4	---	
Input Capacitance	C$_{iss}$	V$_{DS}$=-15V , V$_{GS}$=0V , f=1MHz	---	810	---	pF
Output Capacitance	C$_{oss}$		---	85	---	
Reverse Transfer Capacitance	C$_{rss}$		---	50	---	

Drain-Source Diode Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Continuous Source Current[1]	I$_S$	VG=VD=0V , Force Current	---	---	-4.1	A
Pulsed Source Current[2,5]	Ism		---	---	-16.4	A
Diode Forward Voltage[2]	V$_{SD}$	V$_{GS}$=0V , I$_S$=-1A	---	---	-1	V

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 power dissipation is limited by 150℃ junction temperature
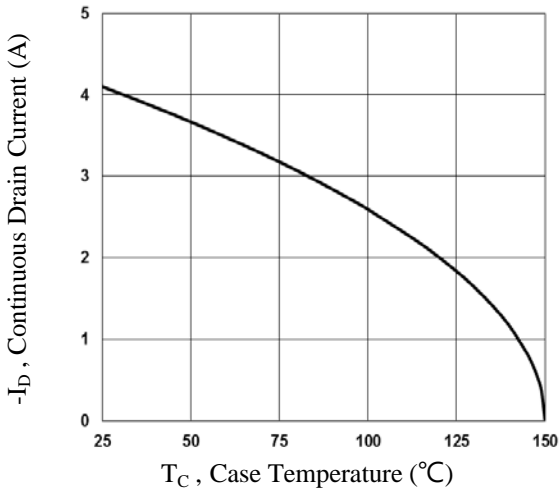
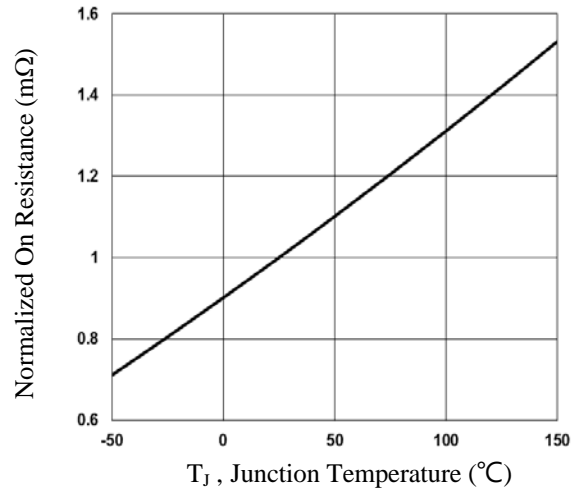## Typical Characteristics

Fig.1   Continuous Drain Current vs. T_C

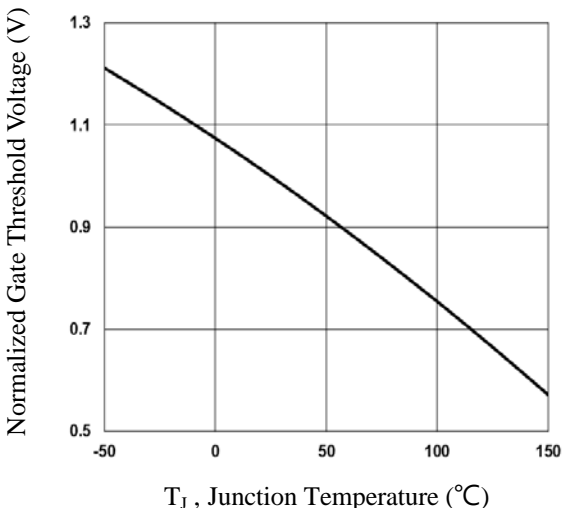Fig.2   Normalized RDSON vs. T_J

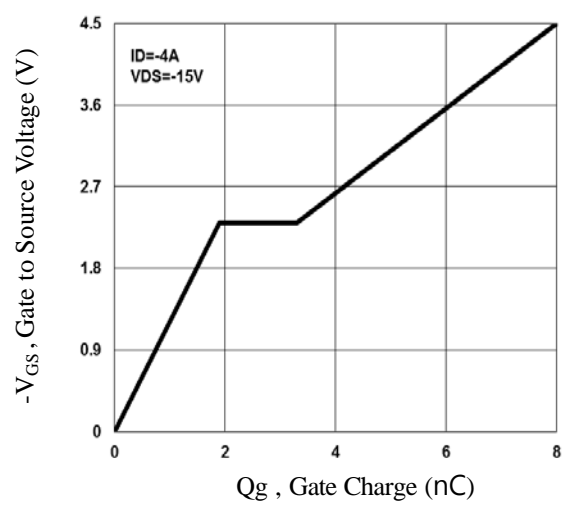Fig.3   Normalized V_{th} vs. T_J
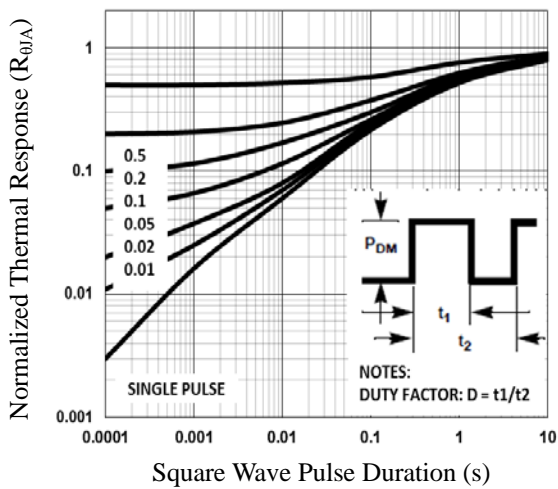

Fig.4   Gate Charge Waveform

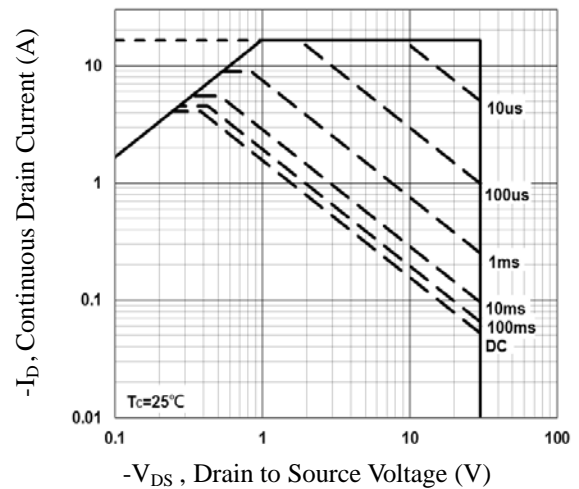
Fig.5   Normalized Transient Impedance

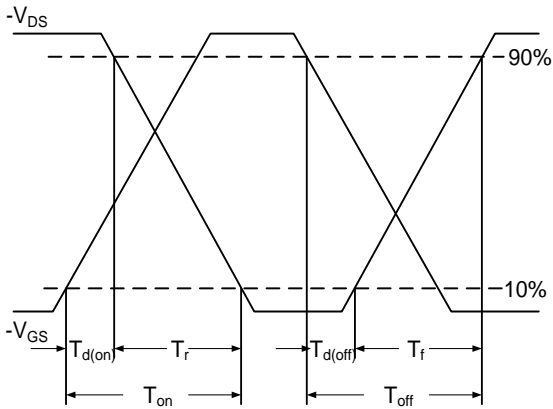Fig.6   Maximum Safe Operation Area
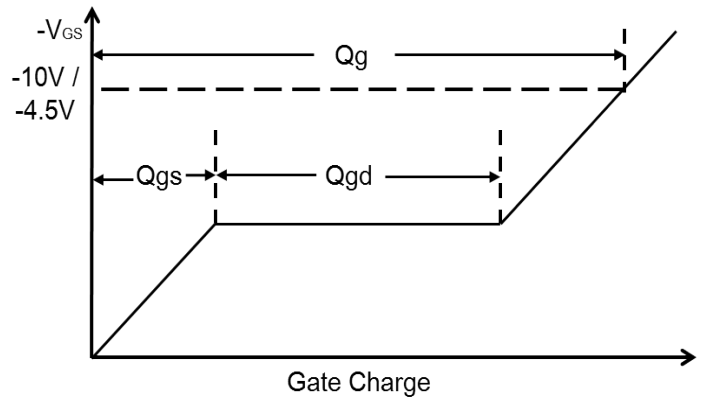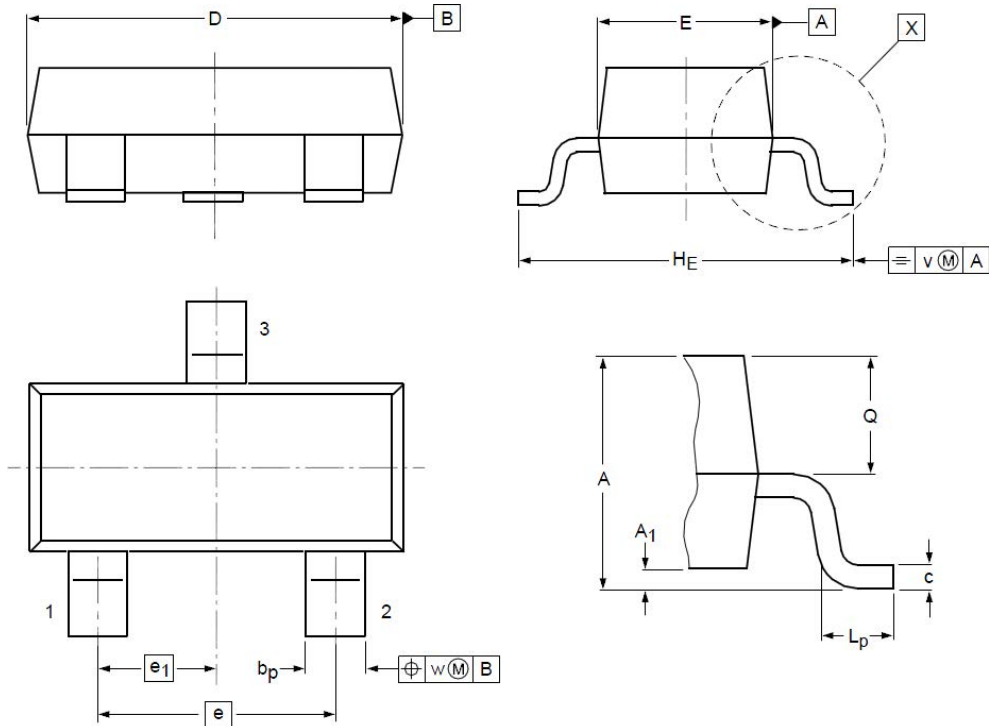
Fig.7   Switching Time Waveform

Fig.8   Gate Charge Waveform

SOT23 Package Outline Dimensions

Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	**Typ**	**Max**		**Min**	**Typ**	**Max**
A	0.90	1.05	1.20	**e_1**	--	0.95	--
A_1	0.01	0.05	0.10	**H_E**	2.10	2.40	2.50
b_p	0.38	0.42	0.48	**L_P**	0.40	0.50	0.60
c	0.09	0.13	0.15	**Q**	0.45	0.49	0.55
D	2.80	2.92	3.00	**V**	--	0.20	--
E	1.20	1.33	1.40	**W**	--	0.10	--
e	--	1.90	--				