PAN7002AKSN

N-CH 60V Fast Switching MOSFET

V_{DS}=60V, I_D=0.46A, $RDS_{(ON)}$=2800mΩ

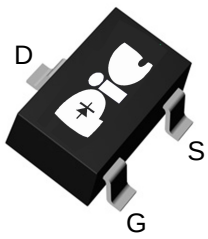
➢ General Description

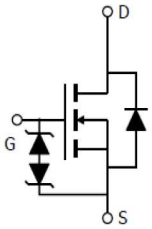
This PAN7002AKSN N-Channel enhancement mode power field effect transistor is the high density trench technology and this advanced technology can provide excellent Rds(On) performance and efficiency for power switching and load switching application., this device also comply with the RoHS and Green Product requirement with full function reliability approved.

➢ Feature

- ●Low on resistance $R_{DS(ON)}$
- ●Low gate threshold voltage
- ●Low input capacitance
- ●ESD protected up to 2KV
- ●SOT-23S package design

➢ SOT-23S





➢ Application

- ●Load Switch
- ●Portable instrument
- ●MB / NB / 3C device

➢ Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Continuous Drain Current, V_{GS} @10V (Note 1)	T_A=25℃ T_A=70℃	I_D	0.46 0.34	A
Pulsed Drain Current (Note 2)		I_{DM}	1.84	A
Thermal Maximum Junction to Ambient (Note 1)		$R_{\theta JA}$	150	°C/W
Thermal Maximum Junction to Case		$R_{\theta JC}$	106.6	°C/W
Power Dissipation (Note 3)	T_C=25℃ T_A=25℃	P_D	1.17 0.83	W
Operating and Storage Temperature Range		T_j ,T_{stg}	- 55 to + 150	℃

Note

1. The data simulated by surface mounted on a 1 $inch^2$ FR-4 board with 2OZ copper
2. The data tested by pulsed , pulse width ≦300μs , duty cycle ≦2%
3. Power dissipation is limited by 150°C junction temperature

➢ Electrical Characteristics (T_J=25°C Unless otherwise noted)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Static						
Drain Source Breakdown Voltag	V_{GS}=0V, I_D=250μA	V_{DSS}	60	-	-	V
Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	$V_{GS(th)}$	0.8	-	2.5	V
Gate-Body Leakage Current	V_{DS}=0V, V_{GS}=±20V	I_{GSS}	-	-	±10	μA
Zero Gate Voltage Drain Current	V_{DS}=48V,V_{GS}=0V V_{DS}=48V,V_{GS}=0V, T_J=85℃	I_{DSS}	- -	- -	1 30	μA
Static Drain Source On-Resistance (Note 2)	V_{GS}=10V, I_D=0.4A V_{GS}=4.5V, I_D=0.3A	$R_{DS(ON)}$	- -	1.9 2.4	2.8 3.8	Ω
Dynamic (Note 4)						
Gate Resistance	V_{DS}=0V, V_{GS}=0V, f=1MHz	R_g	-	176	-	Ω
Total Gate Charge	V_{DS}=10V, I_D=0.4A, V_{GS}=4.5V	Q_g	-	1.11	-	nC
Gate-Source Charge		Q_{gs}	-	0.28	-	
Gate-Drain Charge		Q_{gd}	-	0.07	-	
Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1MHz	C_{iss}	-	15.9	-	pF
Output Capacitance		C_{oss}	-	2.30	-	
Reverse Transfer Capacitance		C_{rss}	-	0.3	-	
Turn-On Delay Time	V_{DD}=30V, V_{GS}=10V, I_D=0.2A, R_G=3.3Ω	$t_{d(on)}$	-	3.4	-	ns
Rise Time		t_r	-	17.6	-	
Turn-Off Delay Time		$t_{d(off)}$	-	15.6	-	
Fall Time		t_f	-	46.0	-	
Drain-Source Body Diode						
Diode Forward Voltage (Note 2)	V_{GS}=0V, I_S=0.4A	V_{SD}	-	-	1.3	V
Reverse Recovery Time	I_F=0.4A, dI/dt=100A/μs	t_{rr}	-	40	-	ns
Reverse Recovery Charge		Q_{rr}	-	40	-	nC

Note

4. Guarantee by design, not test in mass production

➢ Typical Characteristics

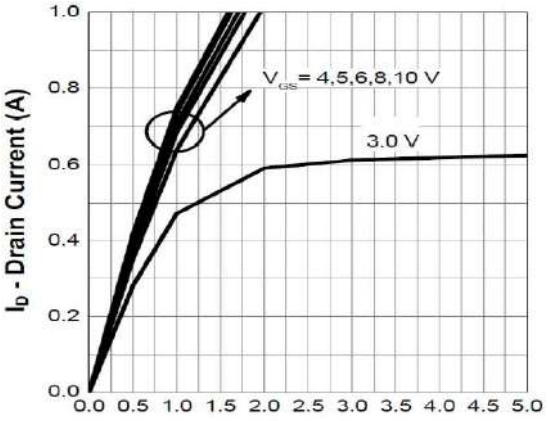


Fig.1 Typical Output Characteristics

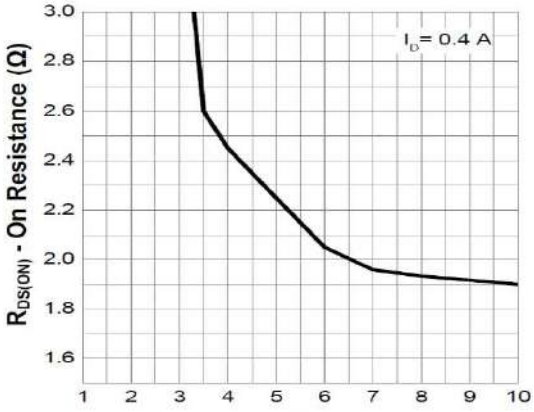


Fig.2 On-Resistance vs. G-S Voltage

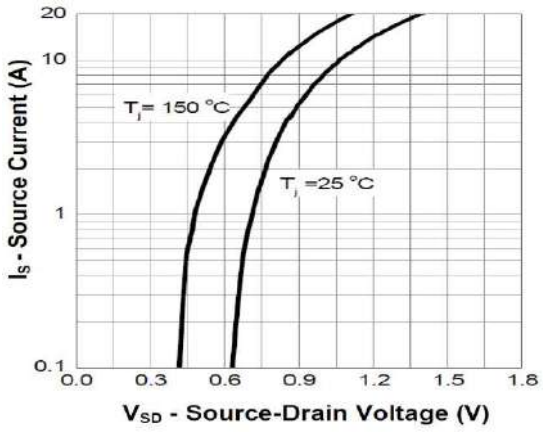


Fig.3 Forward Characteristics Of Reverse

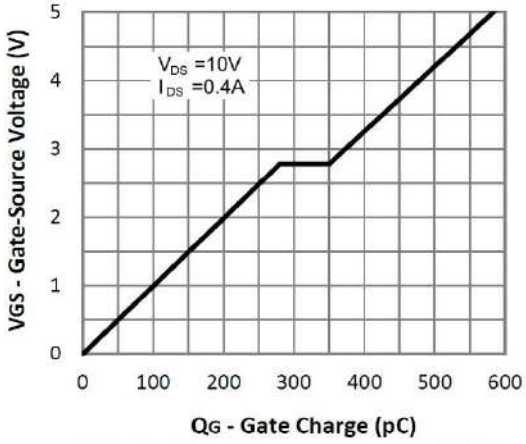


Fig.4 Gate-Charge Characteristics

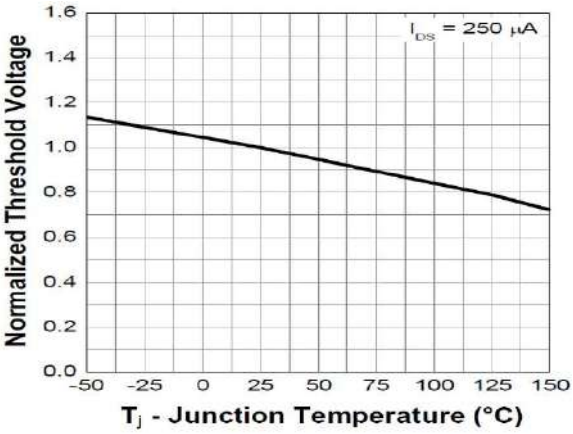


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

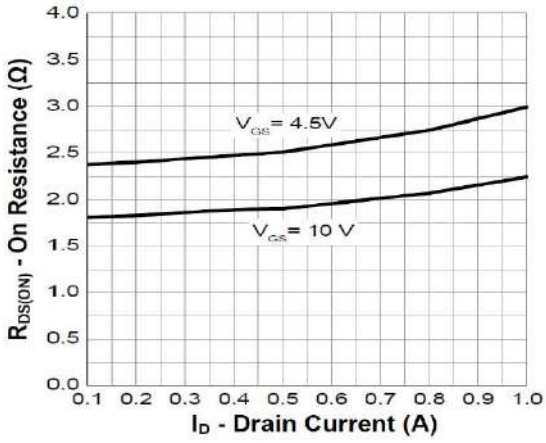


Fig.6 Drain-Source on Resistance

➢ Typical Characteristics

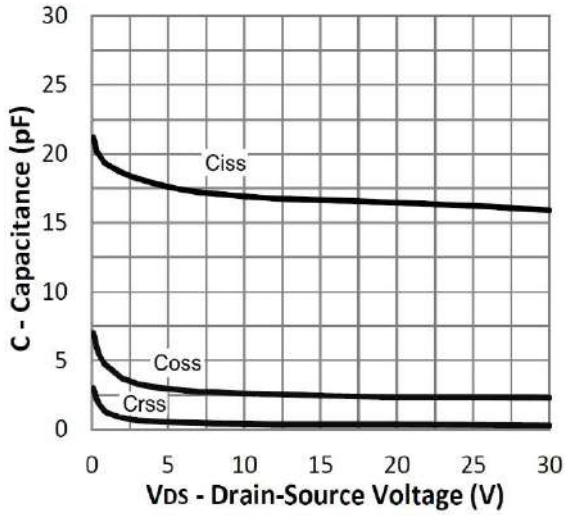


Fig.7 Capacitance

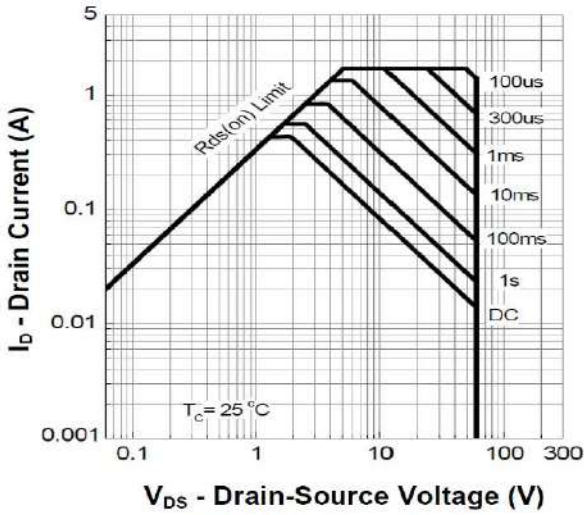


Fig.8 Safe Operating Area

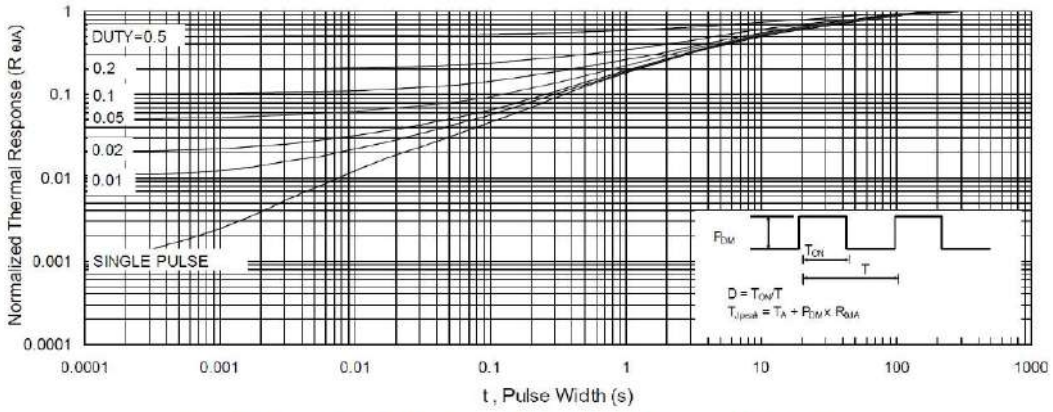
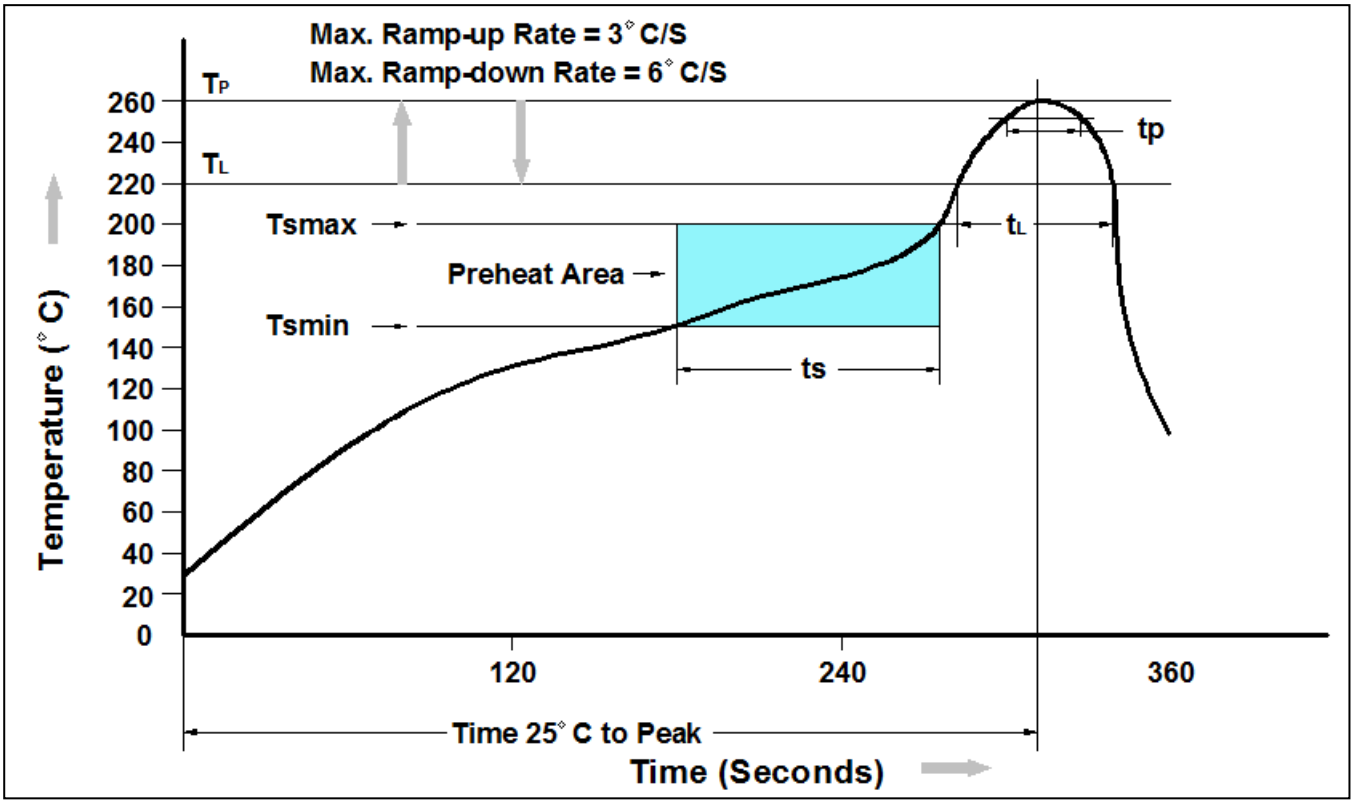


Fig.9 Normalized Maximum Transient Thermal Impedance

➢ Recommand IR Reflow Soldering Thermal Profile

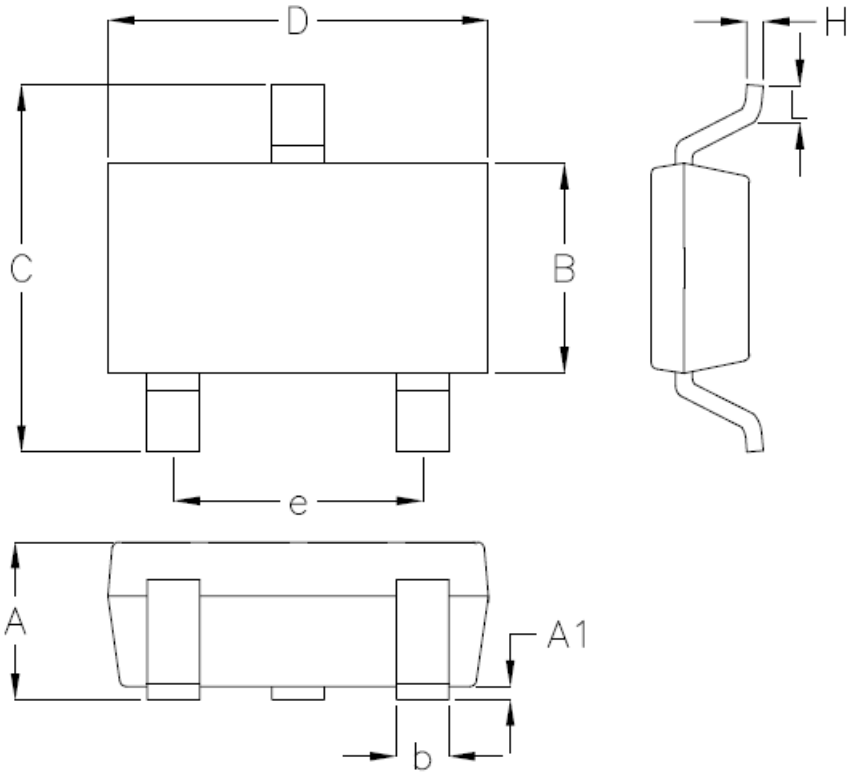


Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150°C
Temperature Max. (Tsmax)	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds
Average Ramp-up Rate (tL to tP)	3°C/second max.
Liquidous Temperature (TL)	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds
Peak Temperature	260°C +0°C / -5°C
Time (tP) within 5°C of actual Peak Temperature	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.

➢ Ordering Information

Part Number	Description	Quantity
PAN7002AKSN	SOT-23S Reel	3000 pcs

➢ Package Information (SOT- 23S)



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.890	1.295	0.035	0.051
A1	0.000	0.152	0.000	0.006
B	1.200	1.400	0.047	0.055
b	0.300	0.508	0.012	0.020
C	2.100	2.640	0.083	0.104
D	2.692	3.099	0.106	0.122
e	1.793	2.007	0.070	0.079
H	0.080	0.254	0.003	0.010
L	0.300	0.610	0.012	0.024

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