PAN00TJ40J

N-Ch 100V Fast Switching MOSFET
### V_{DS}=100V, I_D=11A, RDS(ON)=14mΩ

➤ General Description

This PAN00TJ40J 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

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

➤ SOP-8
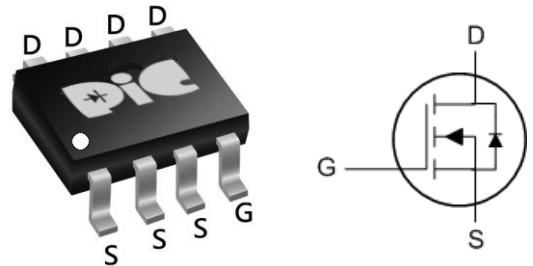
➤ Application

- ●Notebook CPU Core-High-Side Switch

➤ Absolute Maximum Ratings

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, V_{GS} @ 10V[1,6]	I_D@T_A=25°C	11	A
Continuous Drain Current, V_{GS} @ 10V[1,6]	I_D@T_A=70°C	8	A
Pulsed Drain Current[2]	I_{DM}	50	A
Single Pulse Avalanche Energy[3]	EAS	101	mJ
Avalanche Current	I_{AS}	45	A
Total Power Dissipation[4]	P_D@T_A=25°C	3.1	W
Storage Temperature Range	T_{STG}	-55 to 150	°C
Operating Junction Temperature Range	T_J	-55 to 150	°C
Thermal Resistance Junction-Ambient [1](t≦10s)	$R_{\theta JA}$	40	°C/W
Thermal Resistance Junction-Ambient [1]		75	°C/W
Thermal Resistance Junction-Case[1]	$R_{\theta JC}$	24	°C/W

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=250uA	100	---	---	V
Static Drain-Source On-Resistance2	$R_{DS(ON)}$	V_{GS}=10V , I_D=10A	---	12.8	14	mΩ
Static Drain-Source On-Resistance2		V_{GS}=4.5V , I_D=8A		15	17	
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	1.2	---	3	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=80V , V_{GS}=0V , T_J=25°C	---	---	1	uA
		V_{DS}=80V , V_{GS}=0V , T_J=55°C	---	---	5	
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Forward Transconductance	gfs	V_{DS}=5V , I_D=10A	---	43	---	S
Gate Resistance	R_g	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	0.7	---	Ω
Total Gate Charge (10V)	Qg		---	75	---	nC
Gate-Source Charge	Qgs	V_{DS}=80V , V_{GS}=10V , I_D=10A	---	15.5	---	
Gate-Drain Charge	Qgd		---	20.3	---	
Turn-On Delay Time	Td(on)		---	18.5	---	ns
Rise Time	Tr	V_{DD}=40V , V_{GS}=10V , R_G=3.3Ω,	---	8.8	---	
Turn-Off Delay Time	Td(off)	I_D=10A	---	58.8	---	
Fall Time	Tf		---	15.8	---	
Input Capacitance	Ciss		---	4708	---	pF
Output Capacitance	Coss	V_{DS}=25V , V_{GS}=0V , f=1MHz	---	326	---	
Reverse Transfer Capacitance	Crss		---	247	---	

➢ Diode Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current1,5	I_S	V_G=V_D=0V , Force Current	---	---	11	A
Pulsed Source Current2,5	I_{SM}		---	---	50	A
Diode Forward Voltage2	V_{SD}	V_{GS}=0V , I_S=A , T_J=25°C	---	---	1.2	V
Reverse Recovery Time	trr	I_F=10A , dI/dt=100A/μs ,	---	28	---	nS
Reverse Recovery Charge	Qrr	T_J=25°C	---	50	---	nC

Note :

1.Pulse width limited by maximum junction temperature.

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}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=45A

4.Ensure that the channel temperature does not exceed 150°C.

5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.
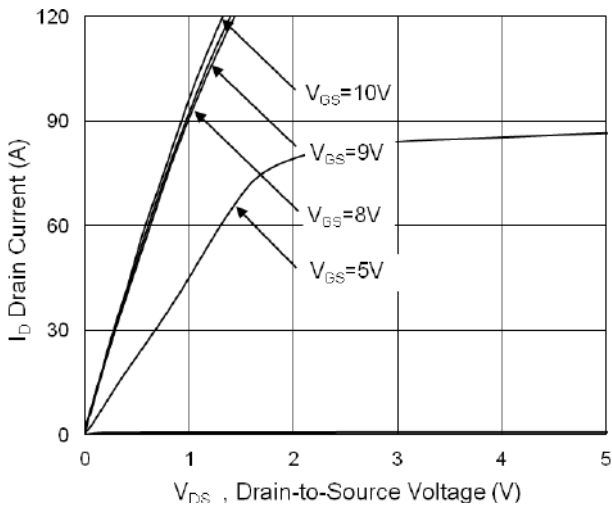
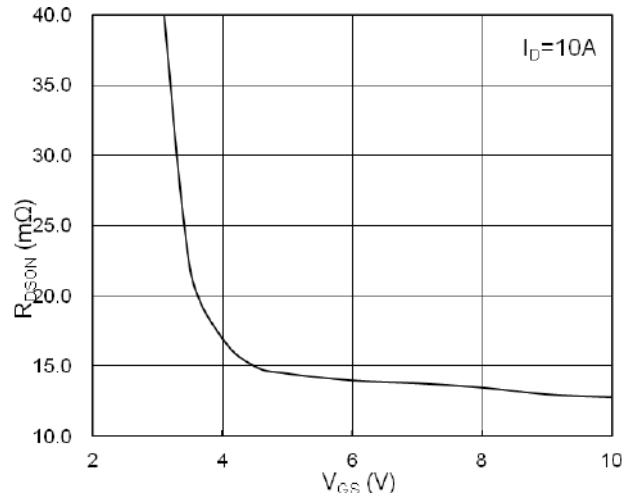> ## Typical Characteristics

Fig.1 Typical Output Characteristics
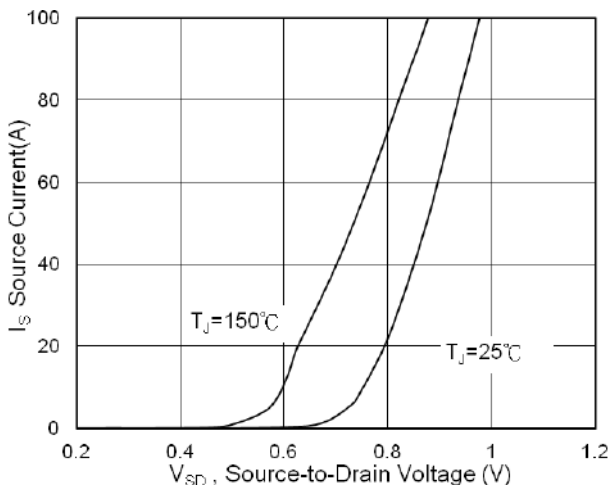

Fig.2 On-Resistance v.s Gate-Source

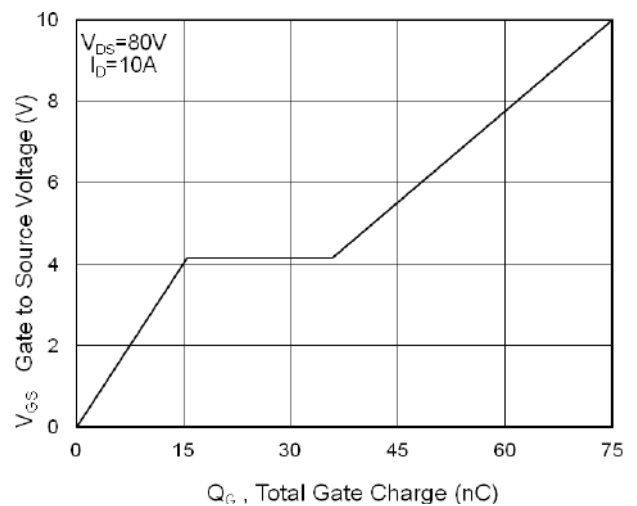**Fig.3 Forward Characteristics of Reverse**
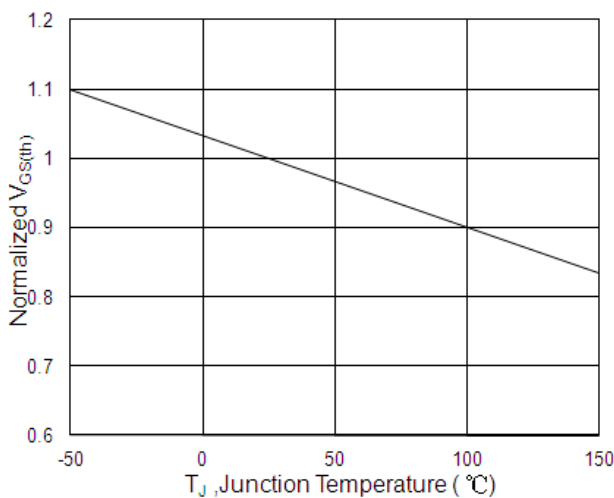

Fig.4 Gate-Charge Characteristics

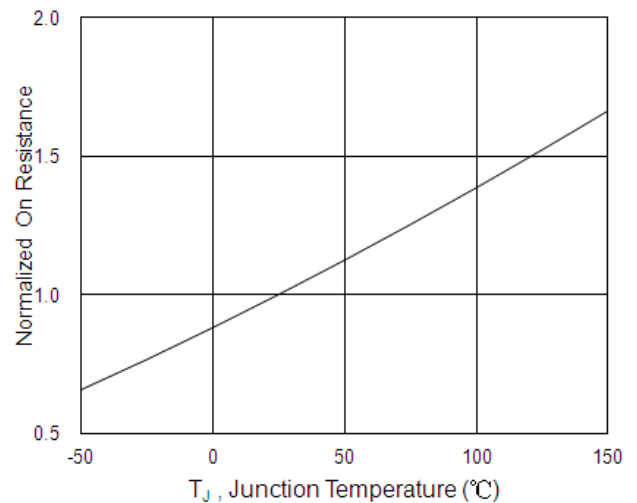**Fig.5 Normalized V$_{GS(th)}$ vs. T$_J$**

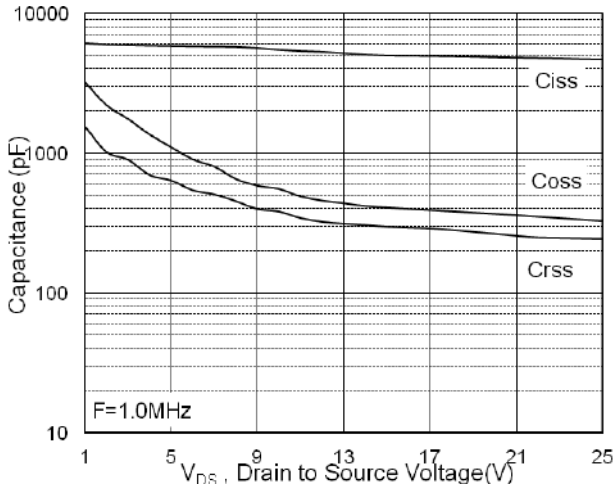**Fig.6 Normalized R$_{DSON}$ vs. T$_J$**
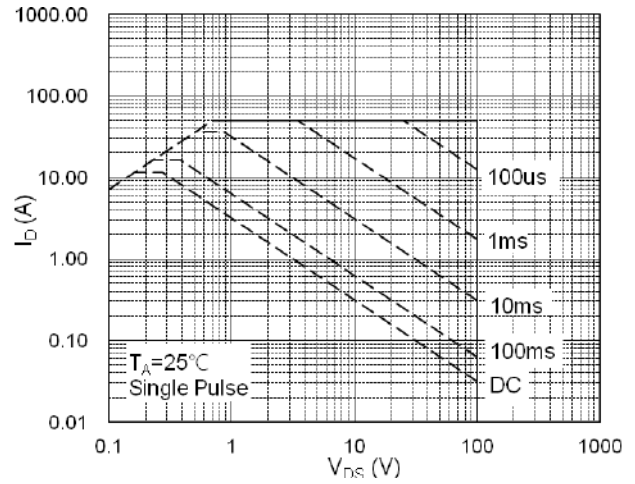
Fig.7 Capacitance
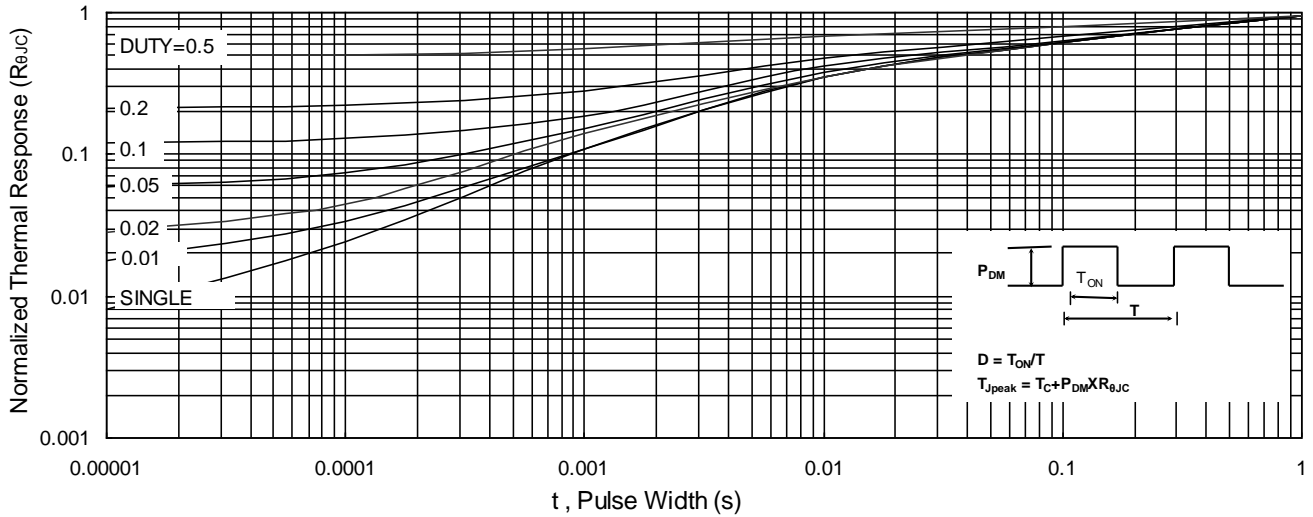

Fig.8 Safe Operating Area

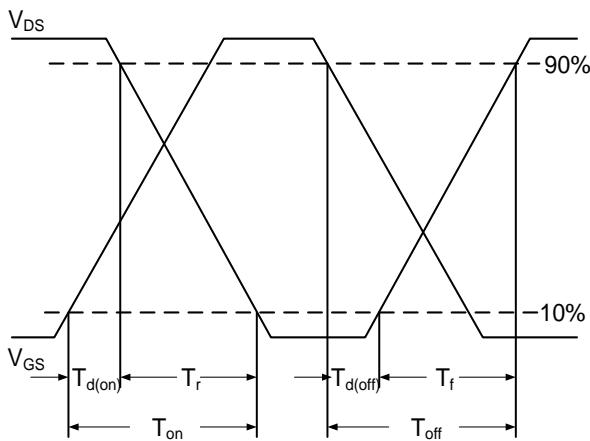**Fig.9 Normalized Maximum Transient Thermal Impedance**

Fig.10 Switching Time Waveform

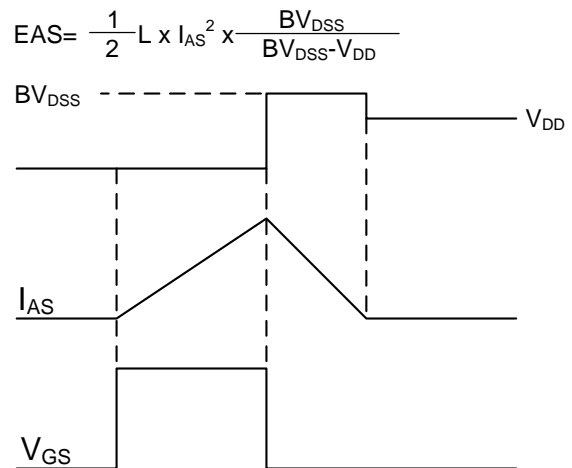$$EAS= \frac{1}{2}L \times I_{AS}^2 \times \frac{BV_{DSS}}{BV_{DSS}-V_{DD}}$$

Fig.11 Unclamped Inductive Switching Waveform

➤ 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
PAN00TJ40J	SOP-8 Reel	2500 pcs

➢ **Package Information (SOP-8)**
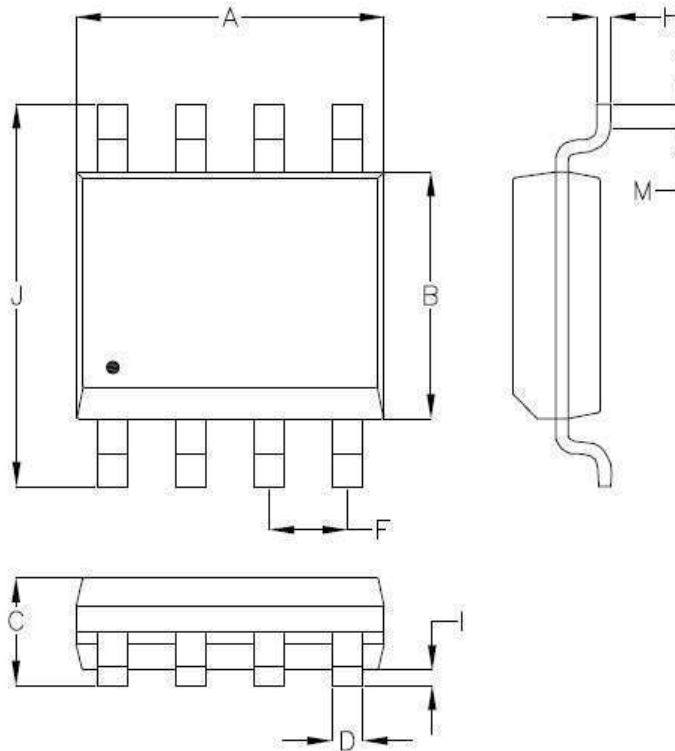
SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.700	5.150	0.185	0.203
B	3.700	4.100	0.146	0.161
C	1.23	1.753	0.048	0.069
D	0.310	0.510	0.012	0.020
F	1.070	1.470	0.042	0.058
H	0.160	0.254	0.006	0.010
I	0.050	0.254	0.002	0.010
J	5.750	6.250	0.226	0.246
M	0.400	1.270	0.016	0.050

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