PAN90TP04SP

N-Ch 40V Fast Switching MOSFET

V_{DS}=40V, I_D=90A ,$RDS_{(ON)}$=3.3mΩ

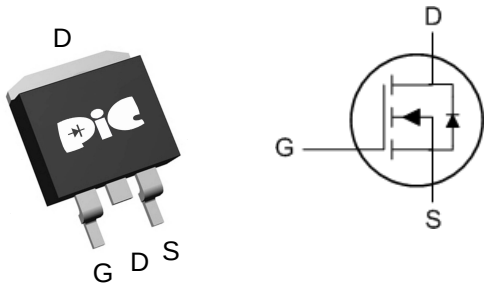
➢ General Description

This PAN90TP04SP N-Channel enhancement mode power field effect transistor is the high density 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
- ●Green Device Available Excellent
- ●Cdv/dt effect decline
- ●Advanced high cell densit Trench
- ●TO-263-2L package design

➢ TO-263-2L



➢ Application

- ●DC-DC Converters
- ●Power Management
- ●Analog Switch

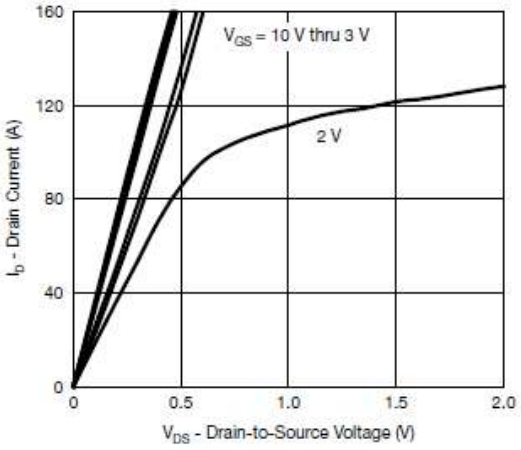
➢ Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	40	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current(T_J=150℃)	T_C=25℃	I_D	90	A
	T_C=70℃		90	
Pulsed Drain Current		I_{DM}	160	
Continuous Source Current(Diode Conduction)		I_S	80	
Single Pulse Avalanche Current		I_{AS}	40	
Power Dissipation	T_C=25℃	P_D	250	W
	T_A=25℃		3.75	
Operating Junction Temperature		T_J	150	℃
Storage Temperature Range		T_{STG}	-55/150	℃
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	62.5	℃/W

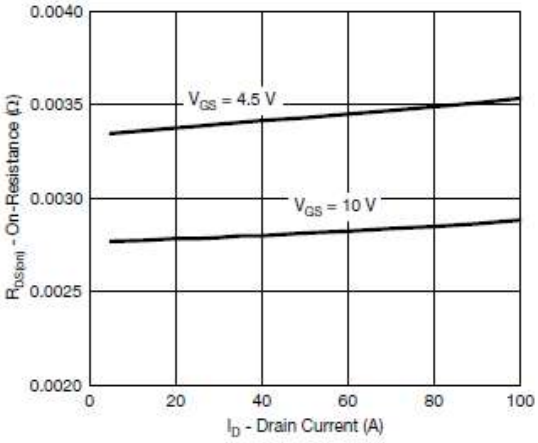
➢ Electrical Characteristics (T_J =25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	40			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	1.0		2.0	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=32V,V_{GS}=0V			1	uA
		V_{DS}=32V,V_{GS}=0V T_J=85℃			10	
On-State Drain Current	$I_{D(on)}$	V_{DS}≧10V,V_{GS}=10V	50			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=25A		2.78	3.3	mΩ
		V_{GS}=4.5V,I_D=20A		3.58	4.1	
Forward Transconductance	g_{FS}	V_{DS}=15V,I_D=15A		75		S
Diode Forward Voltage	V_{SD}	I_S=10A,V_{GS}=0V		0.85	1.3	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=20V,V_{GS}=10V I_D= 20A		60	100	nC
Gate-Source Charge	Q_{gs}			12		
Gate-Drain Charge	Q_{gd}			10		
Input Capacitance	C_{iss}	V_{DS}=20V,V_{GS}=0V f=1MHz		4500		pF
Output Capacitance	C_{oss}			520		
Reverse Transfer Capacitance	C_{rss}			180		
Turn-On Time	$t_{d(on)}$	V_{DD}=20V,R_L=2Ω I_D≡10A,V_{GEN}=10V R_G=1Ω		10	20	ns
	t_r			8	18	
Turn-Off Time	$t_{d(off)}$			40	75	
	t_f			8	18	

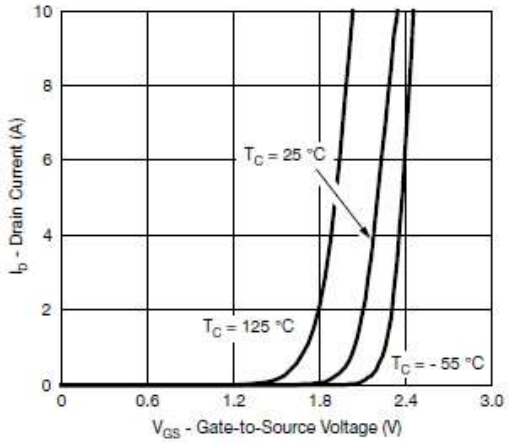
➢ Typical Characteristics



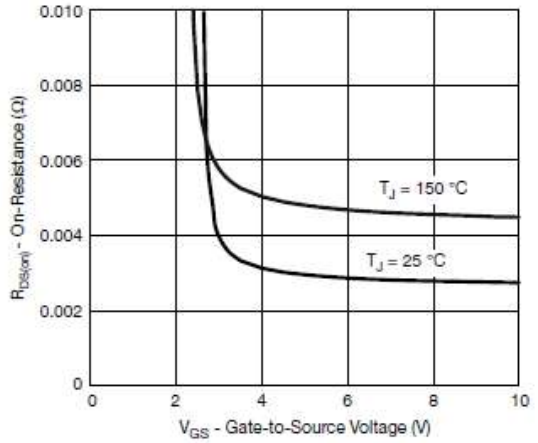
Output Characteristics



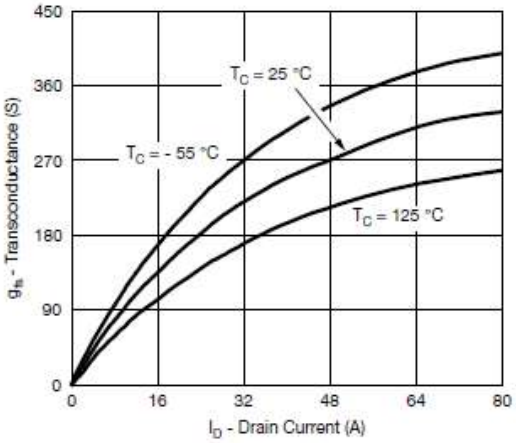
On-Resistance vs. Drain Current



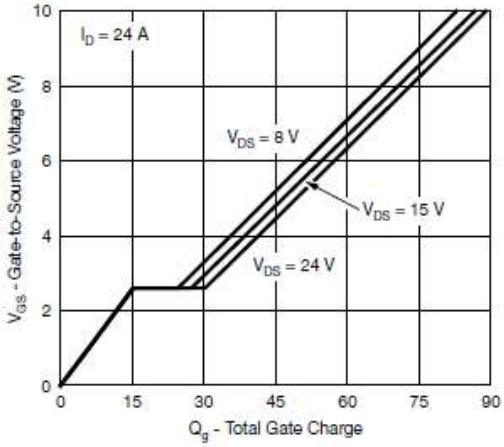
Transfer Characteristics



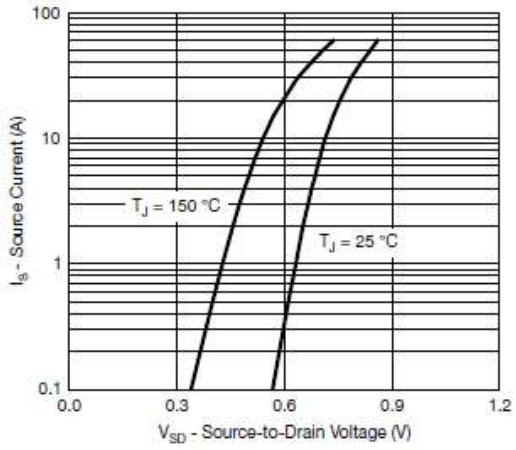
On-Resistance vs. Gate-to-Source Voltage



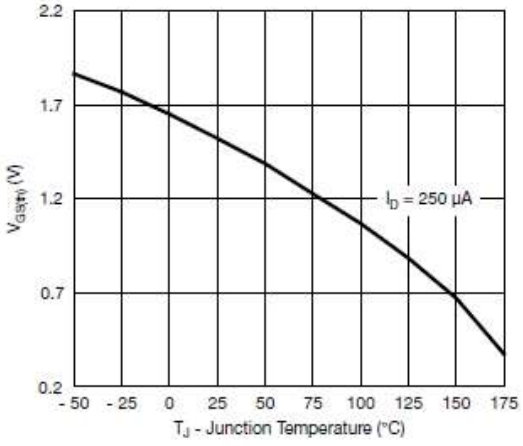
Transconductance



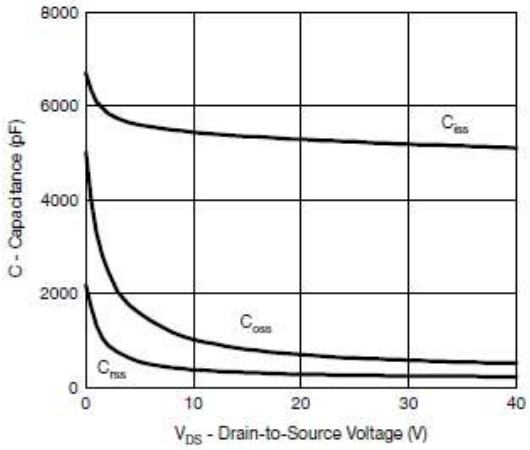
Gate Charge



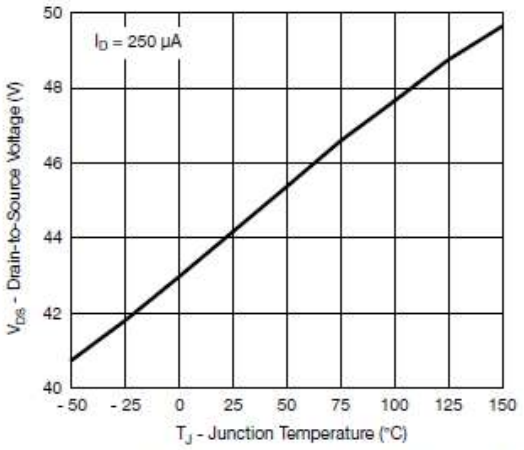
Source-Drain Diode Forward Voltage



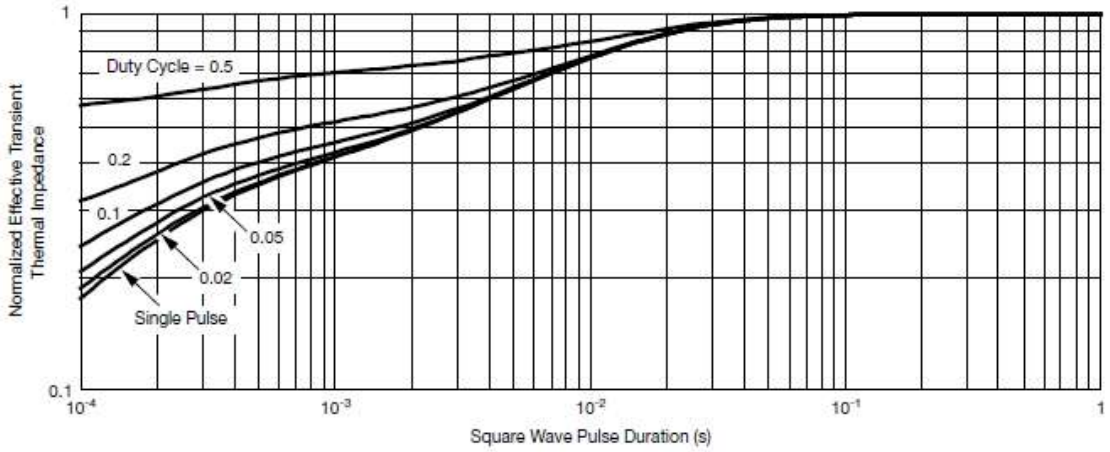
Threshold Voltage



Capacitance

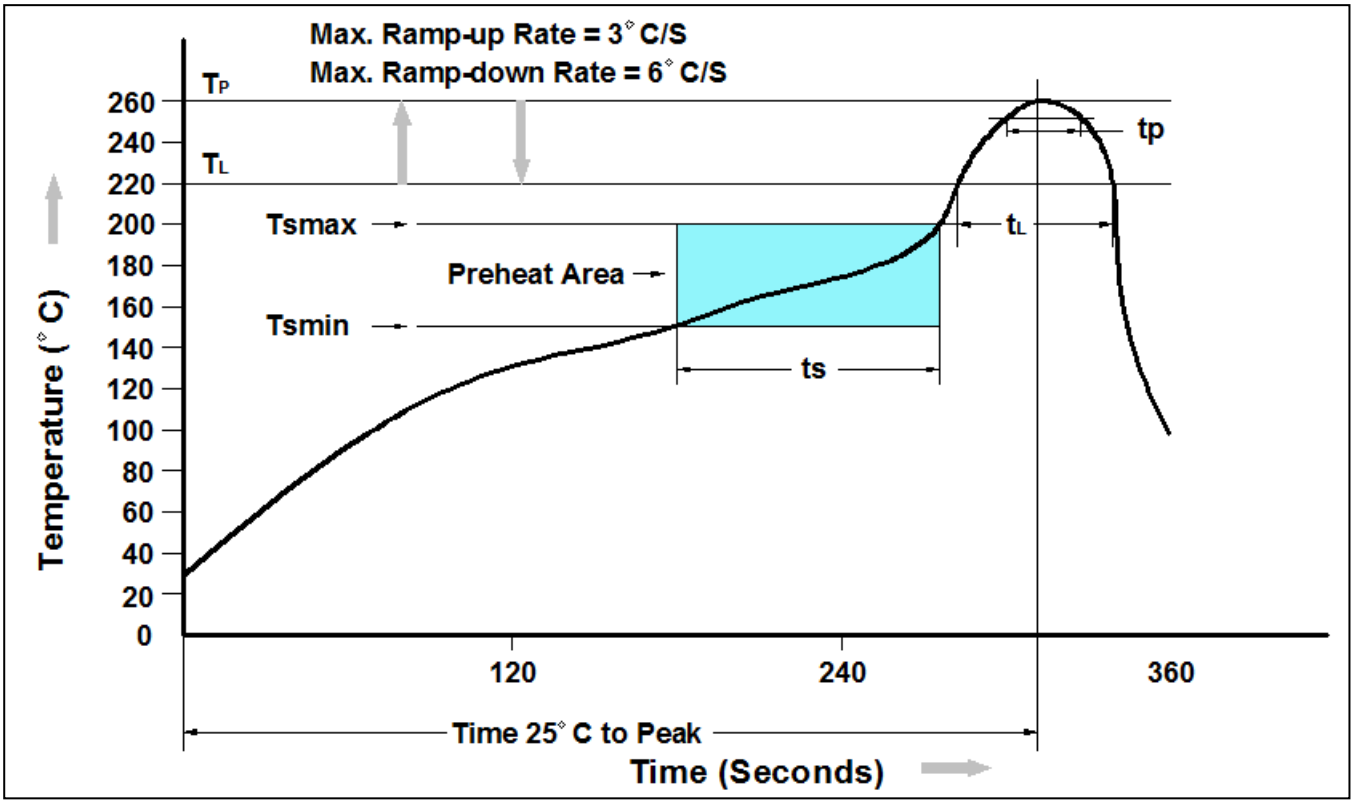


Drain Source Breakdown vs. Junction Temperature



Normalized Thermal Transient Impedance, Junction-to-Case

➢ Recommand IR Reflow Soldering Thermal Profile

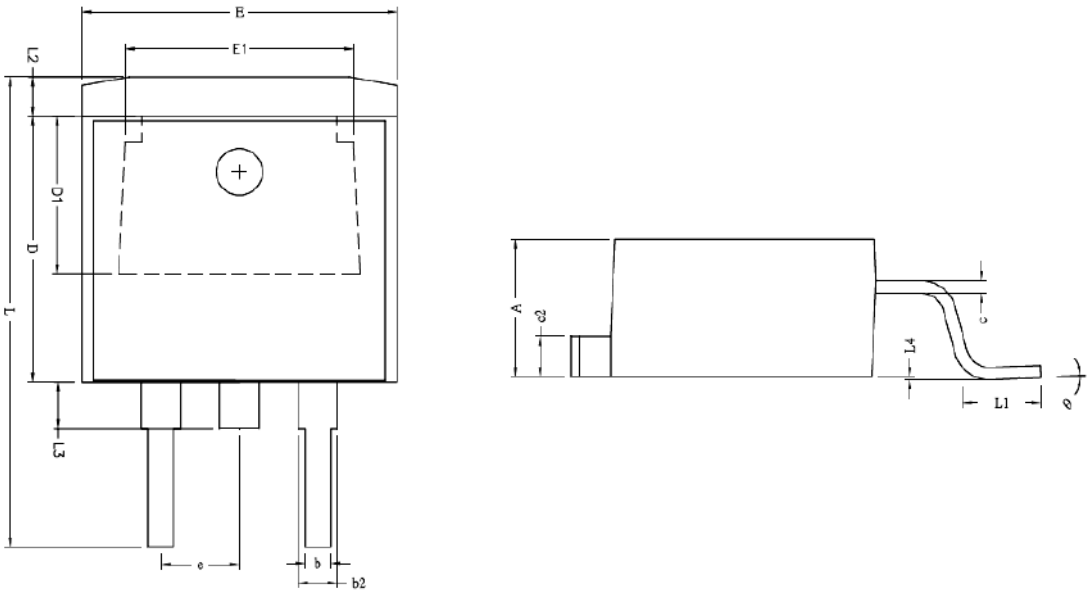


Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150°C
Temperature Max. (Tsmax)	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds
Average Ramp-up Rate (tL to tP)	3°C/second max.
Liquidous Temperature (TL)	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds
Peak Temperature	260°C +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
PAN90TP04SP	TO-263-2L Reel	800

➢ Package Information (TO-263-2L)



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.40	4.80	c2	1.25	1.45
b	0.76	1.0	b2	1.17	1.47
L4	0.00	0.254	D	8.6	9.0
c	0.36	0.50	D1	5.10 REF.	
L3	1.50 REF.		e	2.54 REF.	
L1	2.29	2.79	L	14.6	15.8
E	9.80	10.4	θ	0° ± 3°	
E1	7.40 REF.		L2	1.27 REF.	

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