

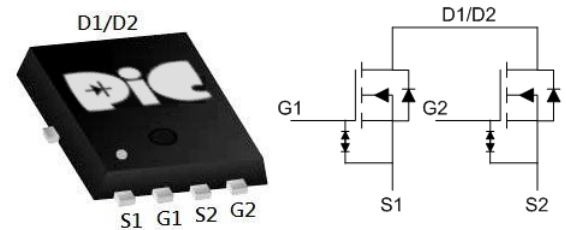
➤ General Description

This PAN27T38EV Dual N-Channel enhancement mode power field effect transistor is the high density trench technology and this advanced technology can provide excellent $R_{ds(On)}$ 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

➤ DFN3X3-NEP



➤ Application

- DC/DC Primary Side Switch
- Industrial Synchronous
- Rectification Load Switch
- ESD Protection

➤ Absolute Maximum Ratings

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ¹	$I_D@T_A=25^\circ C$	12	A
Continuous Drain Current ¹	$I_D@T_A=70^\circ C$	9.6	A
Pulsed Drain Current ²	I_{DM}	72	A
Total Power Dissipation ³	$P_D@T_A=25^\circ C$	2	W
Storage Temperature Range	T_{STG}	-55 to 150	$^\circ C$
Operating Junction Temperature Range	T_J	-55 to 150	$^\circ C$
Thermal Resistance Junction-Ambient ¹	$R_{\theta JA}$	62.5	$^\circ C/W$

➤ Electrical Characteristics ($T_J=25^\circ C$ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	20	---	---	V
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=3A$	6.5	9.1	10.5	$m\Omega$
		$V_{GS}=4.0V, I_D=3A$	7.0	9.5	10.8	$m\Omega$
		$V_{GS}=3.7V, I_D=3A$	7.5	10	11.5	$m\Omega$
		$V_{GS}=3.1V, I_D=3A$	8.0	10.5	12.5	$m\Omega$
		$V_{GS}=2.5V, I_D=3A$	9.5	12.0	15	$m\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	0.5	---	1.2	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=16V, V_{GS}=0V, T_J=25^\circ C$	---	---	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 8V, V_{DS}=0V$	---	---	± 10	μA
Forward Transconductance	g_{fs}	$V_{DS}=5V, I_D=6A$	---	28	---	S
Total Gate Charge (4.5V)	Q_g	$V_{DS}=15V, V_{GS}=4.5V, I_D=5.5A$	---	23	---	nC
Gate-Source Charge	Q_{gs}		---	3.4	---	
Gate-Drain Charge	Q_{gd}		---	7.9	---	
Turn-On Delay Time	$T_{d(on)}$	$V_{DD}=15V, V_{GS}=4.5V, R_G=3.3\Omega, I_D=5.5A$	---	10.5	---	ns
Rise Time	T_r		---	41.5	---	
Turn-Off Delay Time	$T_{d(off)}$		---	62	---	
Fall Time	T_f		---	25	---	
Input Capacitance	C_{iss}	$V_{DS}=10V, V_{GS}=0V, F=1MHz$	---	1660	---	pF
Output Capacitance	C_{oss}		---	163	---	
Reverse Transfer Capacitance	C_{rss}		---	150	---	

➤ Diode Characteristics

Parameter	Symbol	Conditions	Max.	Unit
Continuous Source Current ¹	I_S	$V_G=V_D=0V$, Force Current	12	A
Diode Forward Voltage ²	V_{SD}	$V_{GS}=0V, I_S=12A, T_J=25^\circ C$	1.2	V

Note :

1. Pulse width limited by maximum junction temperature.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. Ensure that the channel temperature does not exceed $150^\circ C$.
4. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

➤ Typical Characteristics

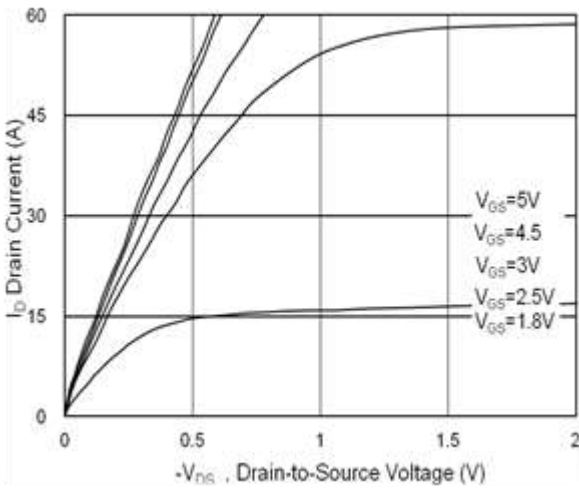


Fig.1 Typical Output Characteristics

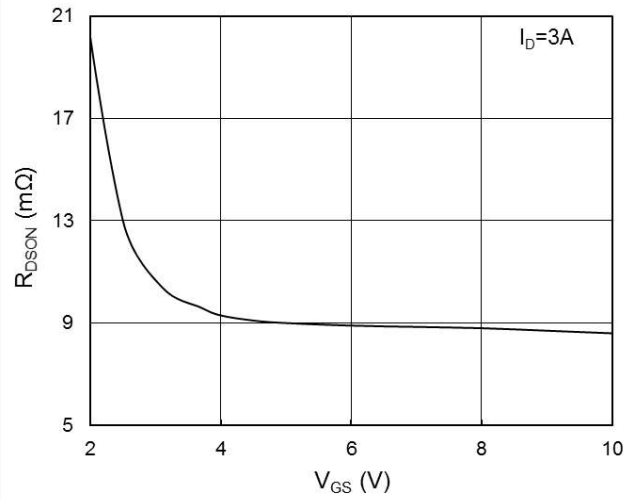


Fig.2 On-Resistance vs G-S Voltage

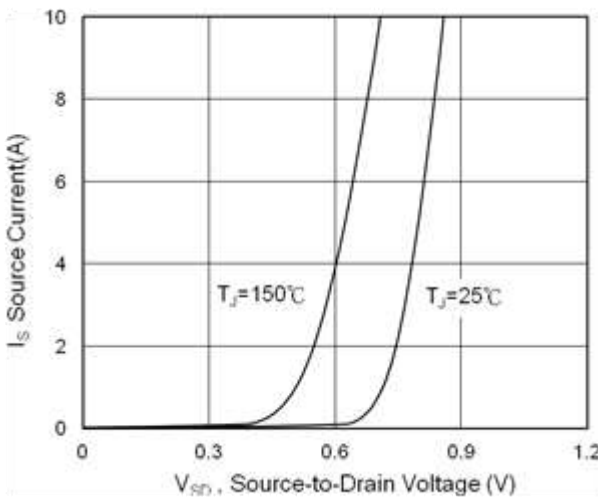


Fig.3 Source Drain Forward Characteristics

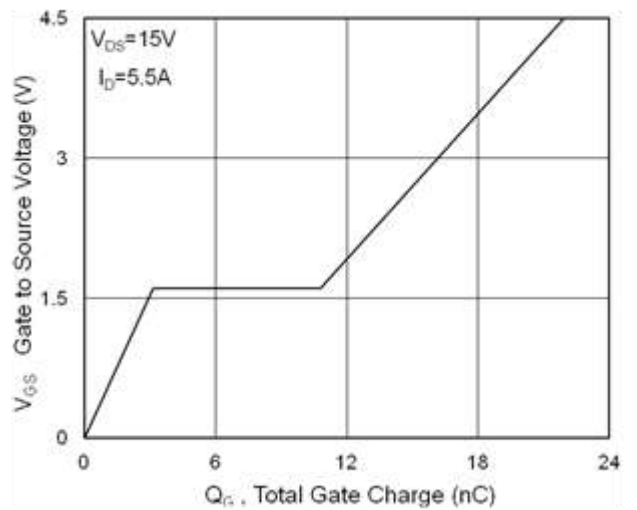


Fig.4 Gate-Charge Characteristics

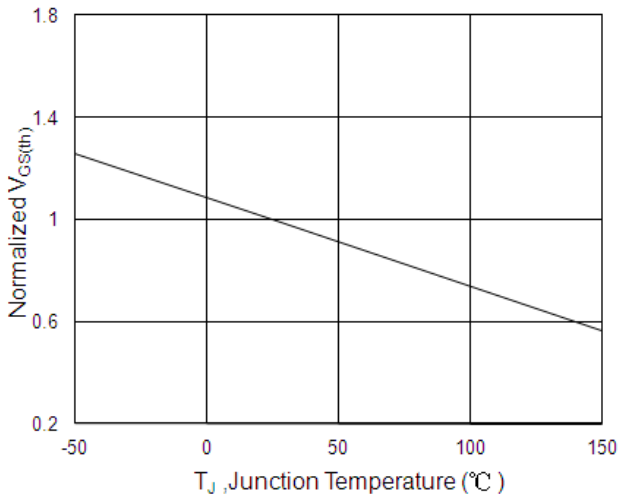


Fig.5 Normalized $V_{GS(th)}$ vs T_J

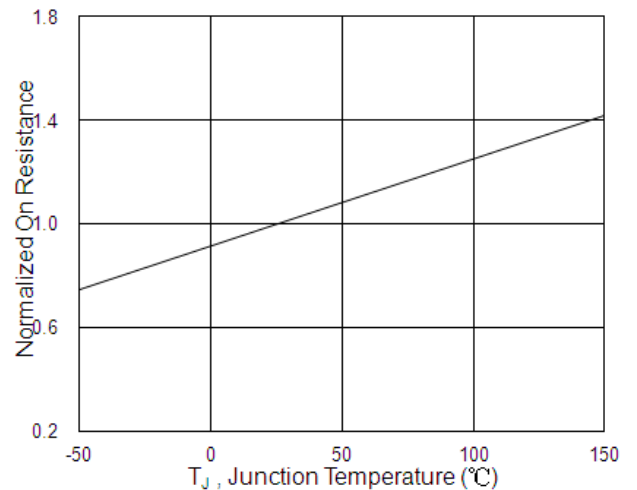


Fig.6 Normalized $R_{DS(on)}$ vs T_J

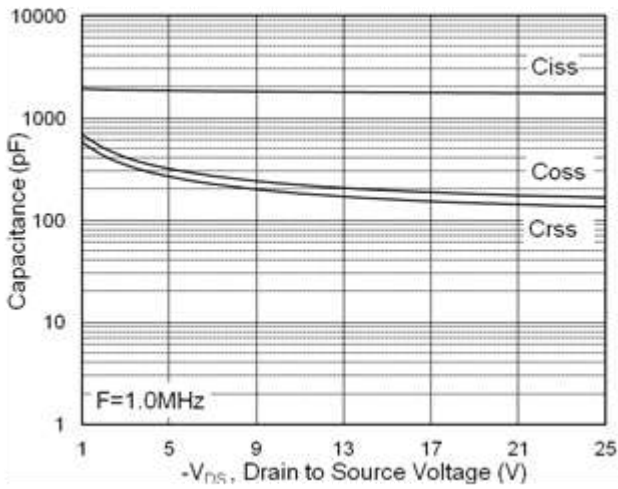


Fig.7 Capacitance

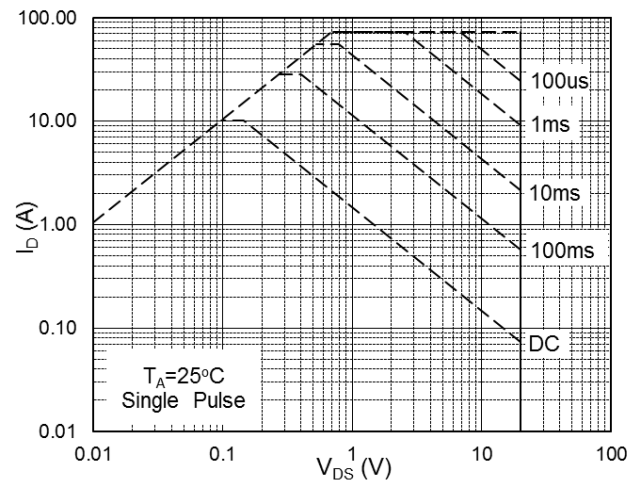


Fig.8 Safe Operating Area

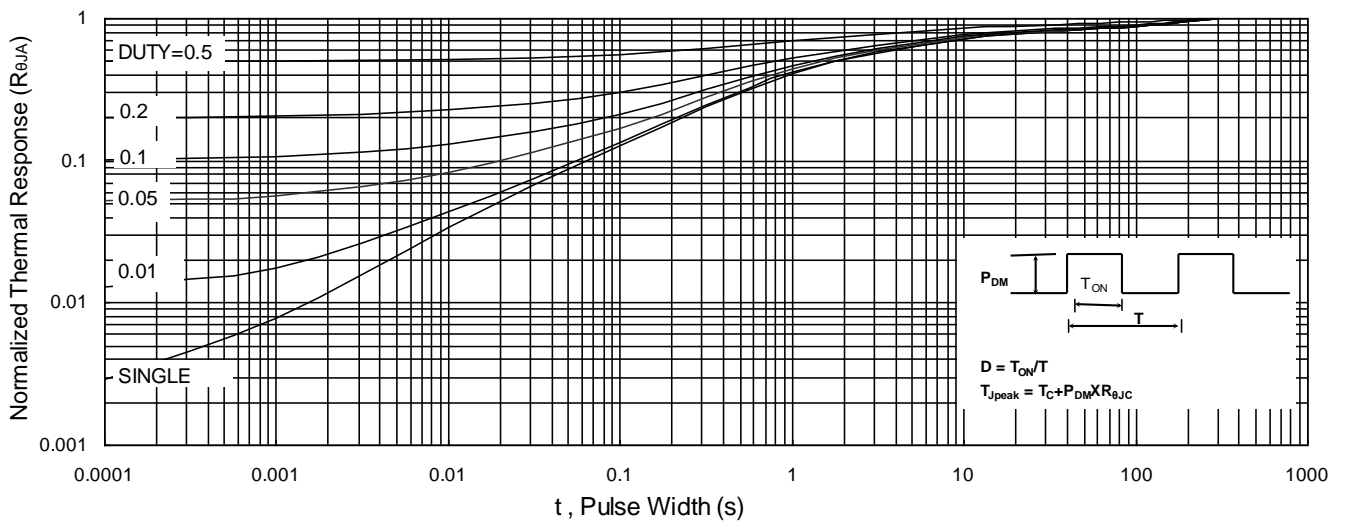


Fig.9 Normalized Maximum Transient Thermal Impedance

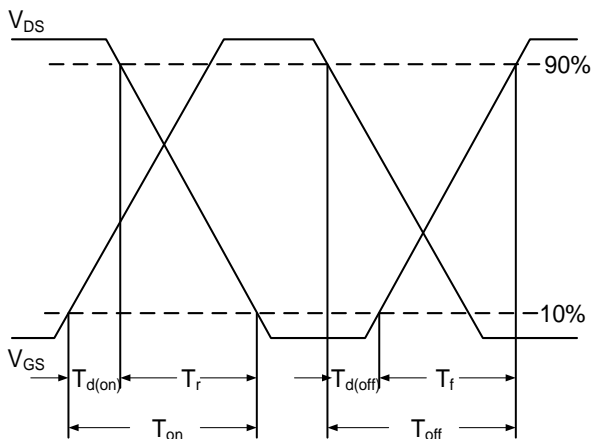


Fig.10 Switching Time Waveform

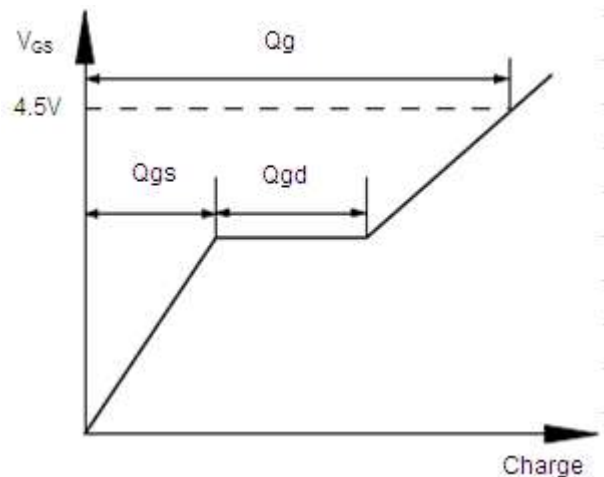
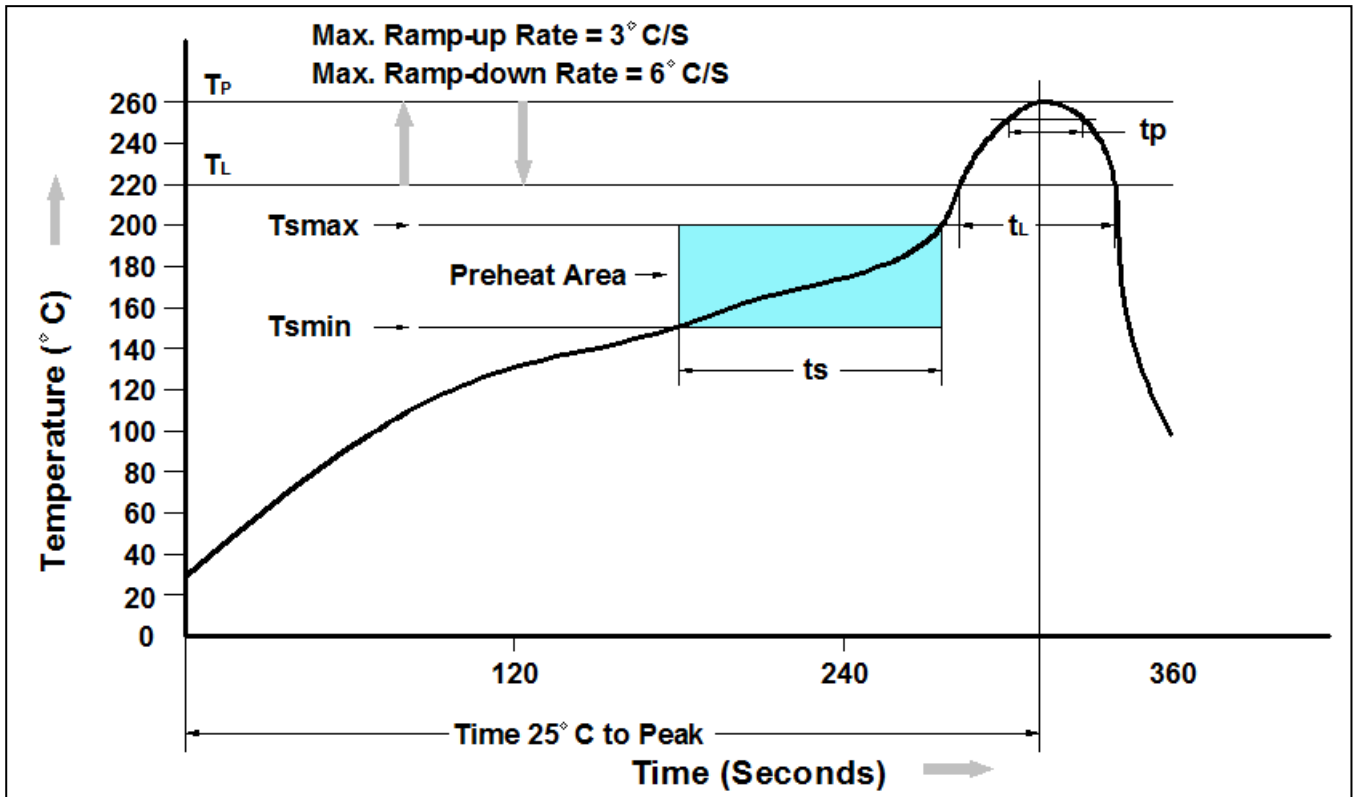


Fig.11 Gate Charge Waveform

➤ Recommend IR Reflow Soldering Thermal Profile

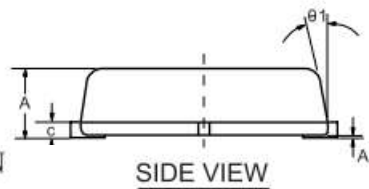
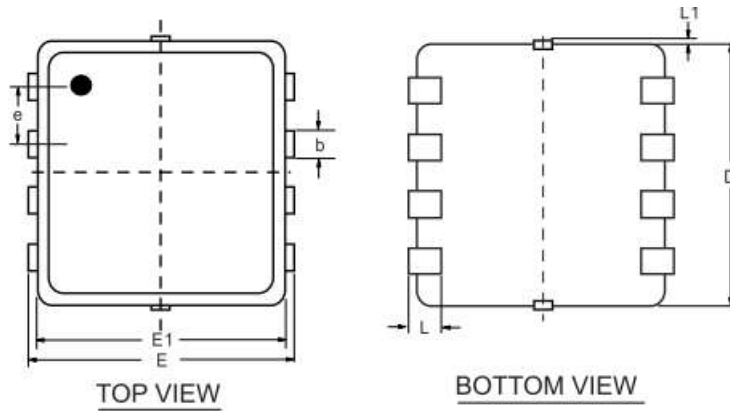


Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T _{smin})	150°C
Temperature Max. (T _{smax})	200°C
Time (t _s) from (T _{smin} to T _{smax})	60-120 seconds
Average Ramp-up Rate (t _L to t _P)	3°C/second max.
Liquidous Temperature (T _L)	217°C
Time (t _L) Maintained Above (T _L)	60 – 150 seconds
Peak Temperature	260°C +0°C / -5°C
Time (t _P) within 5°C of actual Peak Temperature	30 seconds
Ramp-down Rate (T _P to T _L)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.

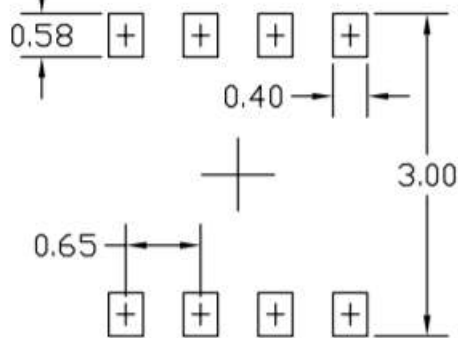
➤ Ordering Information

Part Number	Description	Quantity
PAN27T38EV	DFN3X3-NEP Reel	3000 pcs

➤ Package Information (DFN3X3-NEP)



RECOMMENDED LAND PATTERN



UNIT: mm

SYMBOLS	MILLIMETERS		
	MIN	NOM	MAX
A	0.700	0.800	0.900
A1	0.000	—	0.050
b	0.240	0.300	0.350
c	0.080	0.152	0.250
D	2.800	2.900	3.000
E	2.700	2.800	2.900
E1	2.200	2.300	2.400
e	0.650 BSC		
L	0.200	0.375	0.450
L1	0.000	—	0.100
$\theta 1$	0°	10°	12°

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