

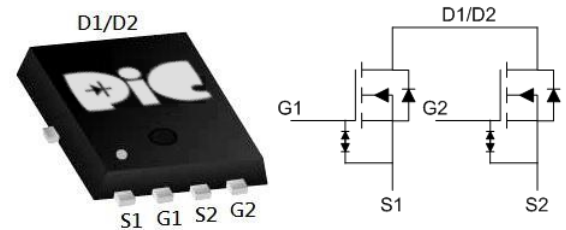
➤ General Description

This PAN27T38EV Dual N-Channel enhancement mode power field effect transistor is the high density trench technology and this advanced technology can provide excellent 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

➤ 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 Ω
		$V_{GS}=4.0V, I_D=3A$	7.0	9.5	10.8	m Ω
		$V_{GS}=3.7V, I_D=3A$	7.5	10	11.5	m Ω
		$V_{GS}=3.1V, I_D=3A$	8.0	10.5	12.5	m Ω
		$V_{GS}=2.5V, I_D=3A$	9.5	12.0	15	m Ω
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

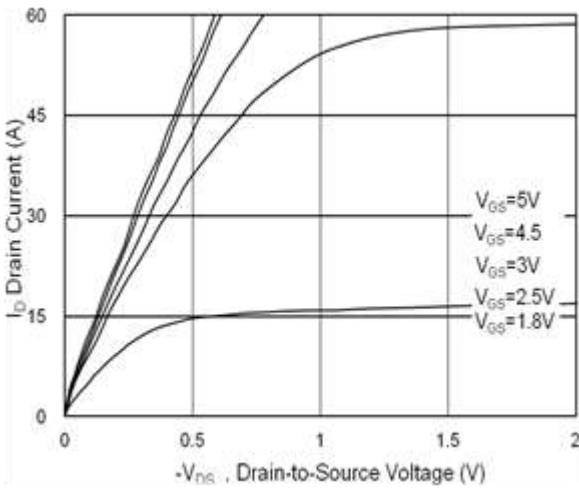


Fig.1 Typical Output Characteristics

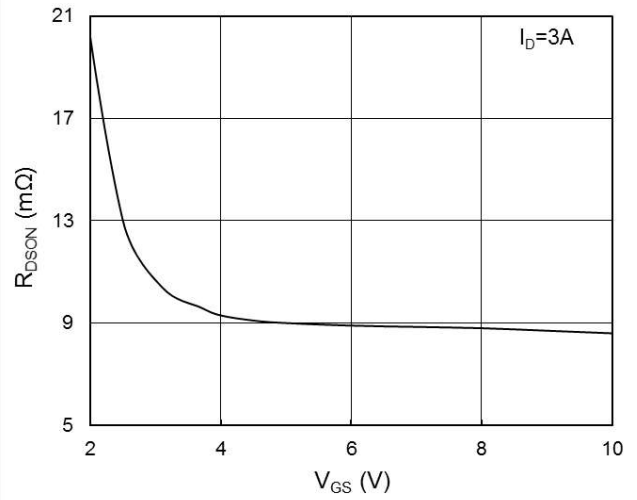


Fig.2 On-Resistance vs G-S Voltage

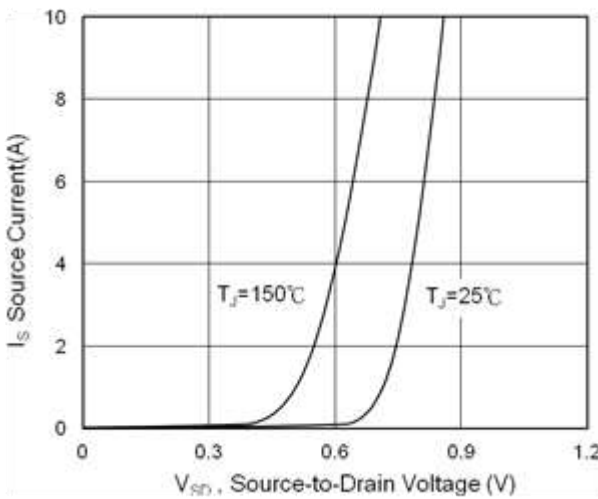


Fig.3 Source Drain Forward Characteristics

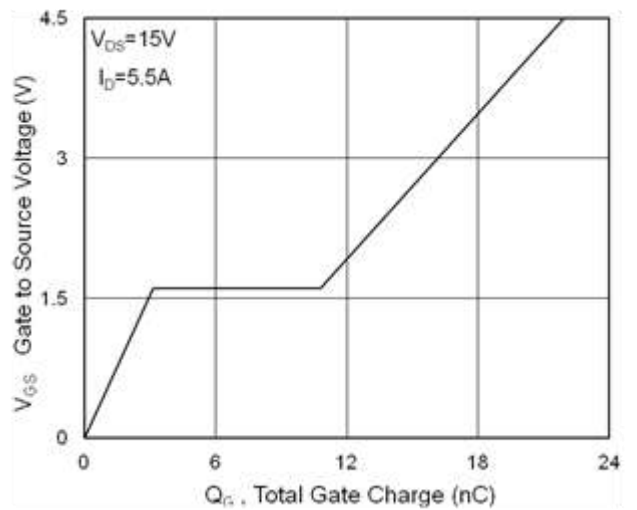


Fig.4 Gate-Charge Characteristics

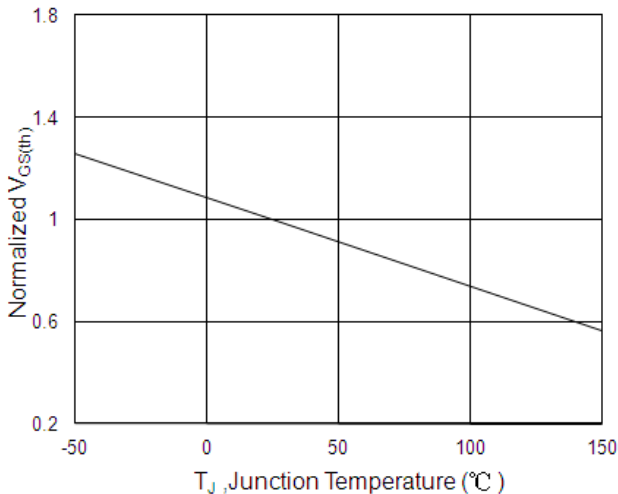


Fig.5 Normalized $V_{GS(th)}$ vs T_J

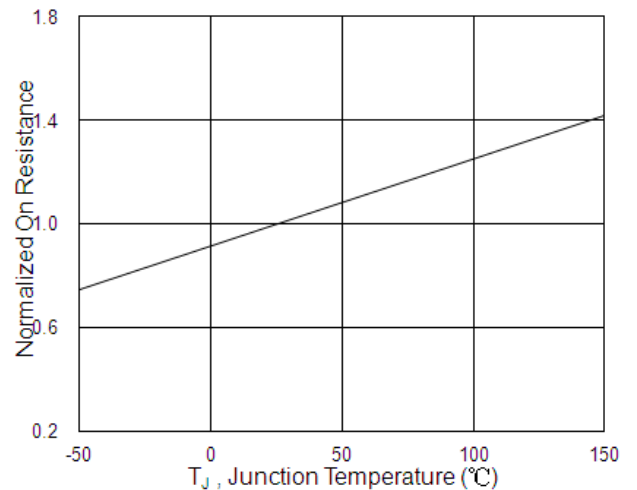


Fig.6 Normalized $R_{DS(on)}$ vs T_J

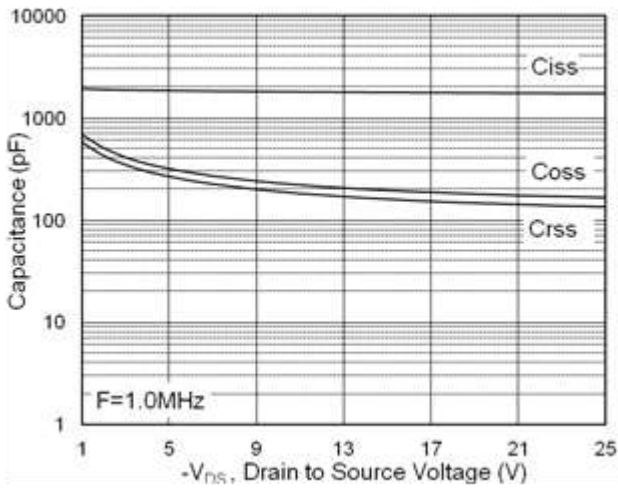


Fig.7 Capacitance

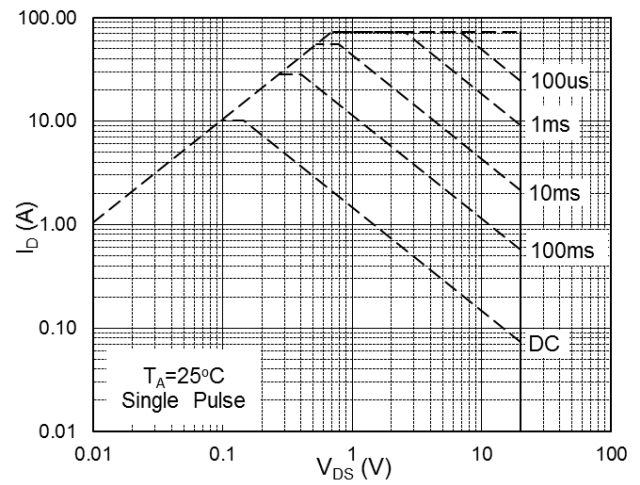


Fig.8 Safe Operating Area

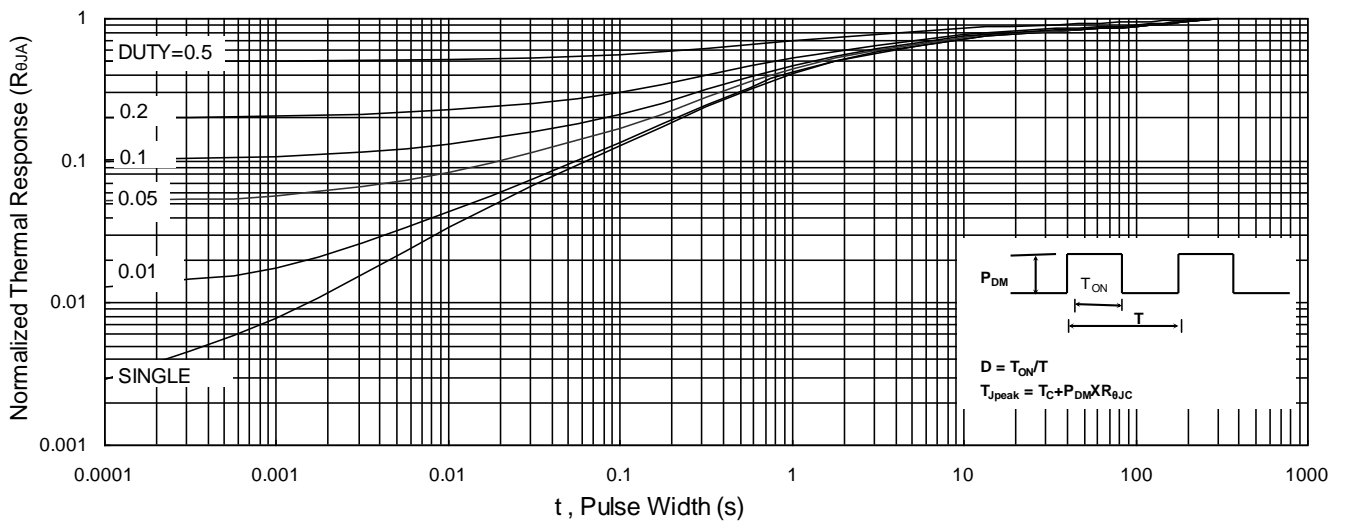


Fig.9 Normalized Maximum Transient Thermal Impedance

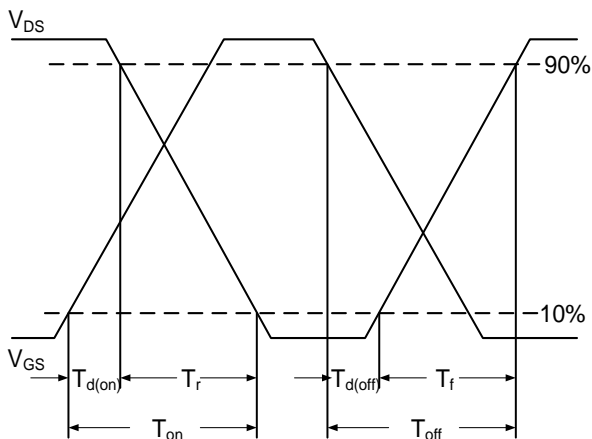


Fig.10 Switching Time Waveform

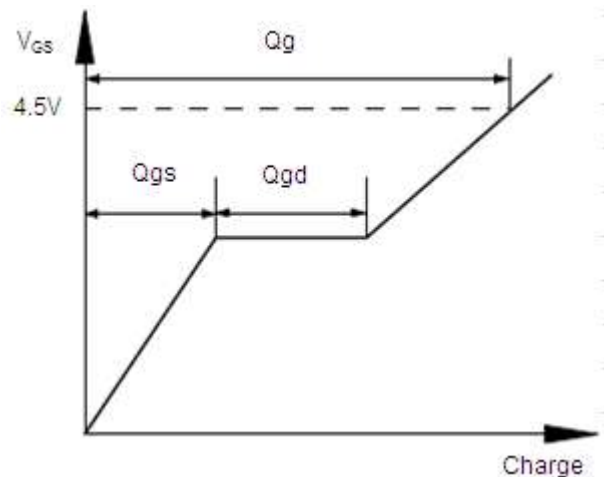
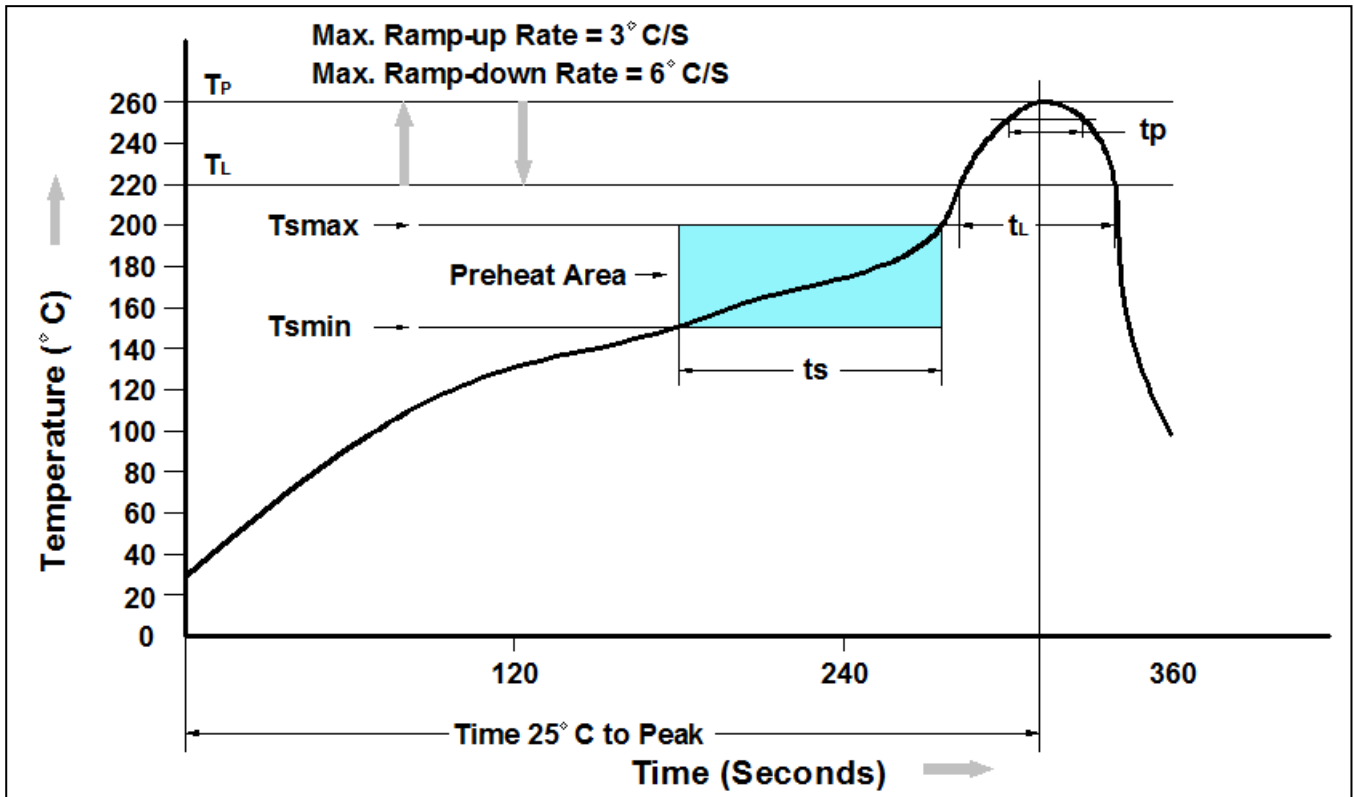


Fig.11 Gate Charge Waveform

➤ Recommand IR Reflow Soldering Thermal Profile

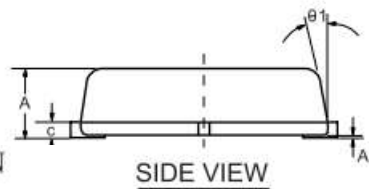
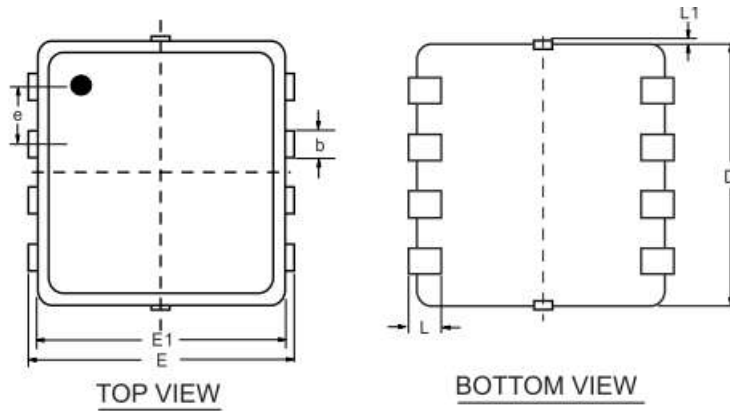


Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T _{smin})	150°C
Temperature Max. (T _{smax})	200°C
Time (t _s) from (T _{smin} to T _{smax})	60-120 seconds
Average Ramp-up Rate (t _L to t _P)	3°C/second max.
Liquidous Temperature (T _L)	217°C
Time (t _L) Maintained Above (T _L)	60 – 150 seconds
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.

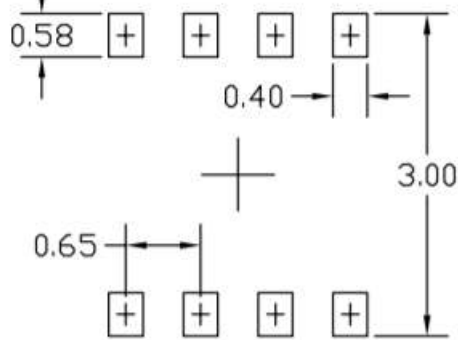
➤ Ordering Information

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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