

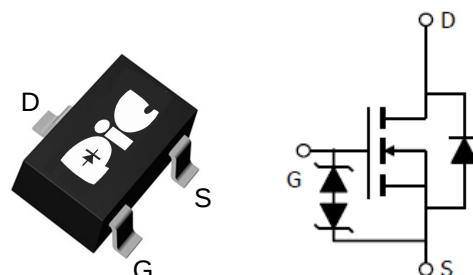
➤ General Description

This PAN7002ESN 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
- Green Device Available
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology
- ESD protected up to 2KV
- SOT-23 Package design

➤ SOT-23



➤ Application

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

➤ Absolute Maximum Ratings

Parameter		Symbol	Maximum Ratings	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	V
Continuous Drain	$T_A=25^\circ C$	I_D	0.27	A
	$T_A=70^\circ C$	I_D	0.22	
Pulsed Drain Current		I_{DM}	1.1	A
Maximum Power Dissipation	$T_A=25^\circ C$	P_D	0.4	W
	$T_A=70^\circ C$	P_D	0.2	
Operating Junction Temperature		T_J	-55 to 150	$^\circ C$
Thermal Resistance-Junction to Ambient*		$R_{\theta JA}$	350	$^\circ C/W$

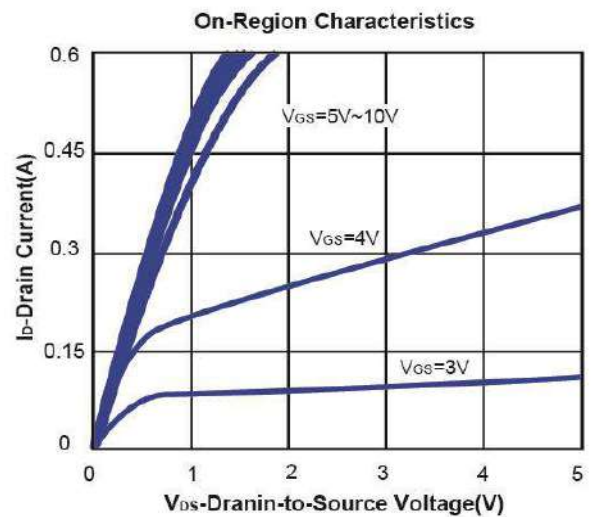
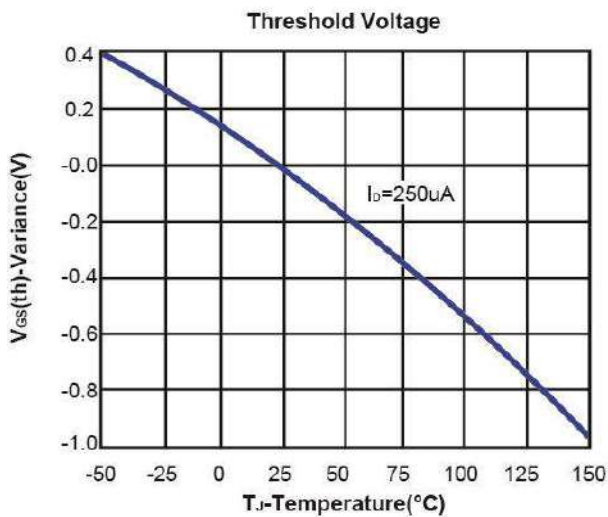
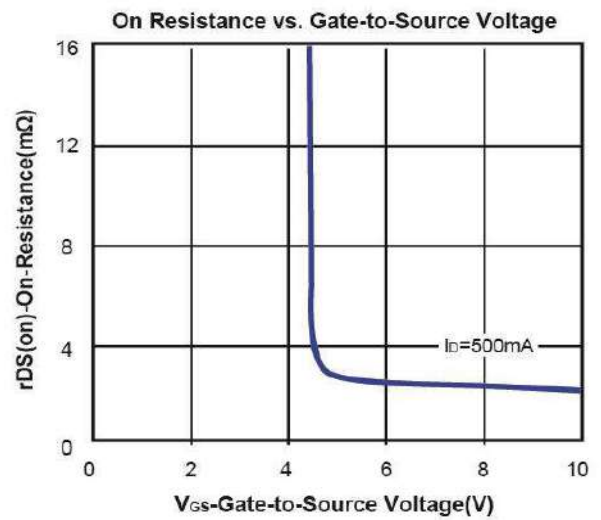
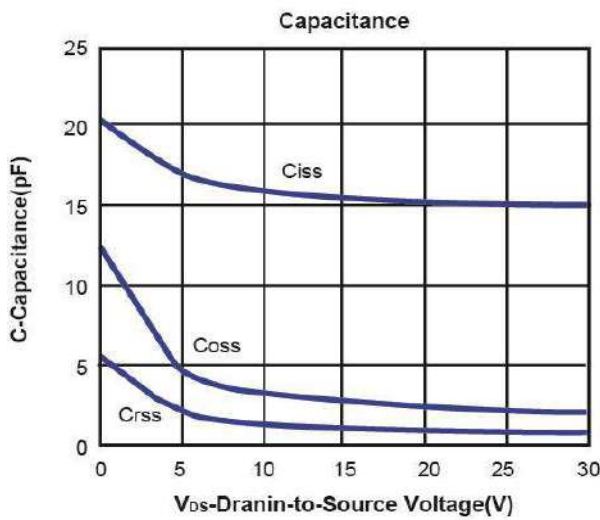
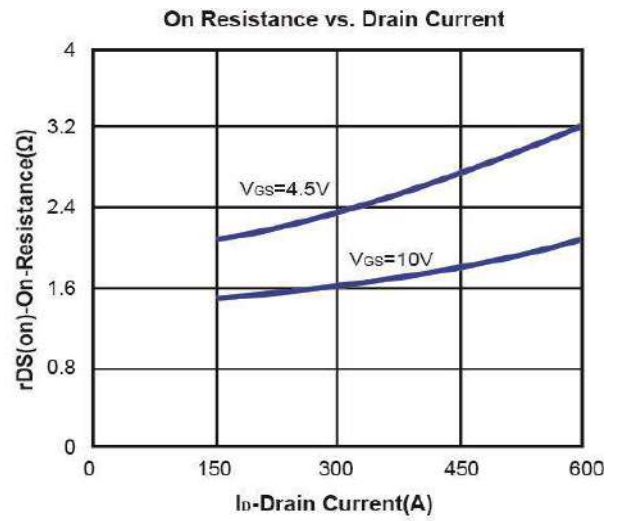
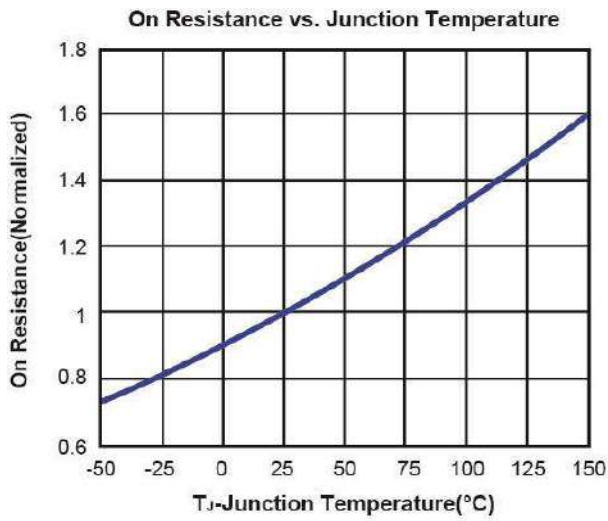
* The device mounted on 1in² FR4 board with 2 oz copper

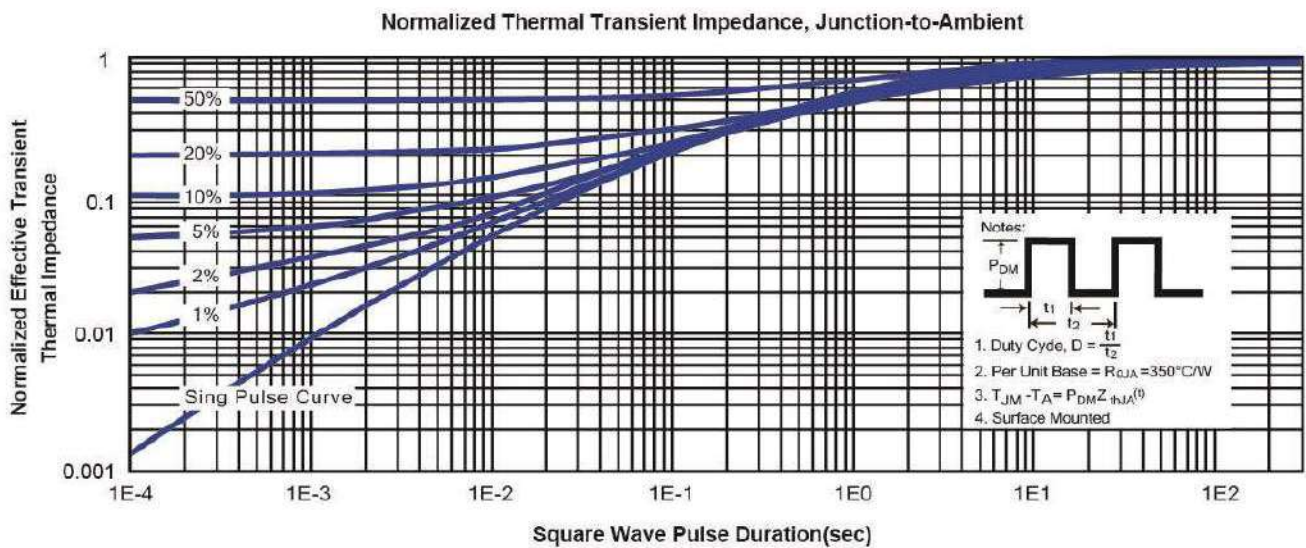
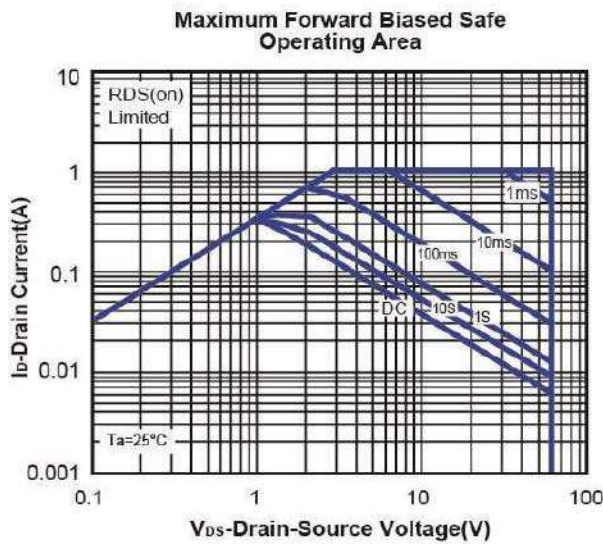
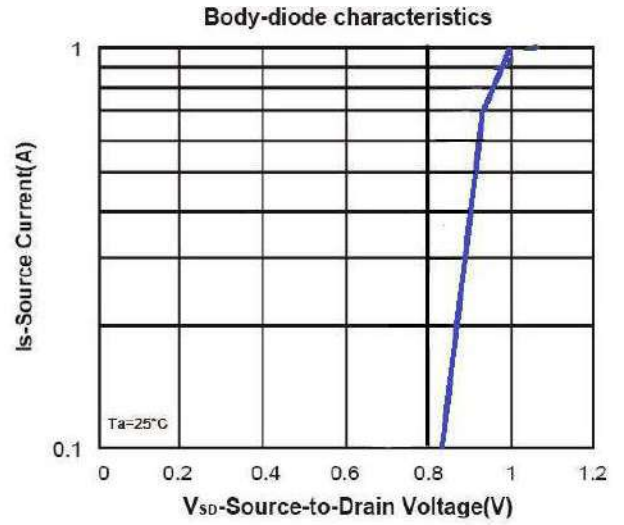
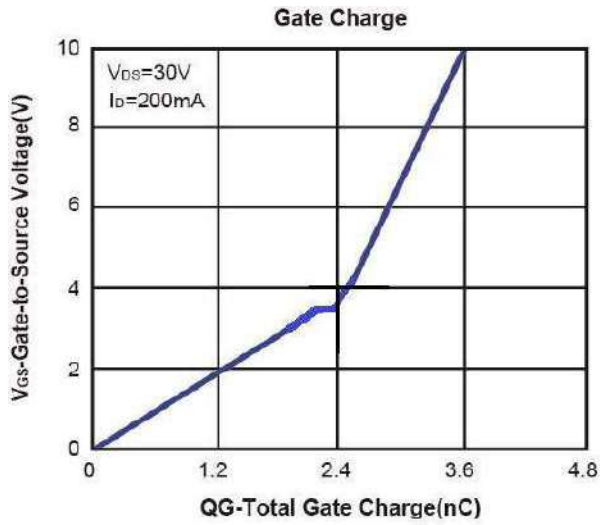
➤ Electrical Characteristics ($T_J=25^\circ C$ Unless otherwise noted)

Symbol	Parameter	Limit	Min	Typ	Max	Unit
STATIC						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	60			V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}$, $I_D=250\mu A$	1		2.5	V
I_{GSS}	Gate-Body Leakage	$V_{DS}=0V$, $V_{GS}=\pm 20V$			± 10	μA
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=60V$, $V_{GS}=0V$			1	μA
$R_{DS(ON)}$	Drain-Source On-Resistance*	$V_{GS}=10V$, $I_D=500mA$		1.8	3	Ω
		$V_{GS}=4.5V$, $I_D=200mA$		2.3	4	
		$V_{GS}=3V$, $I_D=10mA$		3.8	4.5	
V_{SD}	Diode Forward Voltage *	$I_S=200mA$, $V_{GS}=0V$		0.82	1.3	V
DYNAMIC						
Q_g	Total Gate Charge	$V_{DS}=30V$, $V_{GS}=10V$, $I_D=200mA$		3.7		nC
Q_g	Total Gate Charge	$V_{DS}=30V$, $V_{GS}=4.5V$, $I_D=200mA$		1.4		
Q_{gs}	Gate-Source Charge			2		
Q_{gd}	Gate-Drain Charge			0.2		
C_{iss}	Input Capacitance	$V_{DS}=25V$, $V_{GS}=0V$, $f=1MHz$		15		pF
C_{oss}	Output Capacitance			2		
C_{rss}	Reverse Transfer Capacitance			1		
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=30V$, $R_L=150\Omega$ $V_{GS}=10V$, $R_G=10\Omega$ $I_D=200mA$		3.7		ns
t_r	Turn-On Rise Time			21.7		
$t_{d(off)}$	Turn-Off Delay Time			5.9		
t_f	Turn-Off Fall Time			21.4		

Notes: a, pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$, Guaranteed by design, not subject to production testing.

➤ Typical Characteristics





➤ Recommand IR Reflow Soldering Thermal Profile

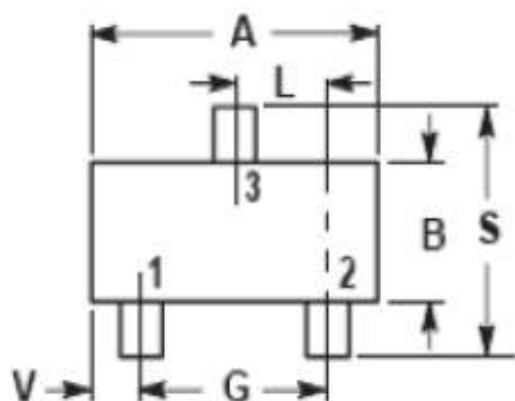


Profile Feature	Pb-Free Assembly Profile
Temperature Min. (T_{smin})	150°C
Temperature Max. (T_{smax})	200°C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds
Average Ramp-up Rate (t_L to t_P)	3°C/second max.
Liquidous Temperature (T_L)	217°C
Time (t_L) Maintained Above (T_L)	60 – 150 seconds
Peak 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

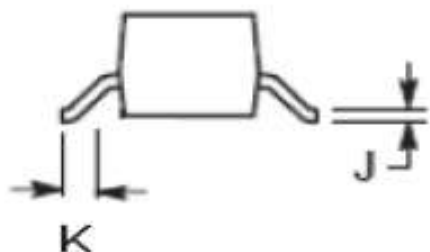
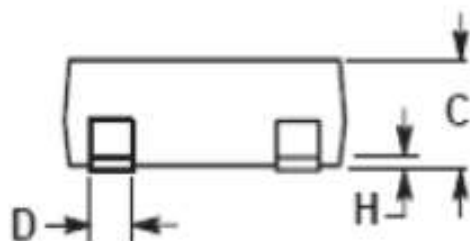
Part Number	Description	Quantity
PAN7002ESN	SOT-23 Reel	3000 pcs

➤ Package Information (SOT-23)



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.



DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.1102	0.1197	2.80	3.04
B	0.0472	0.0551	1.20	1.40
C	0.0350	0.0440	0.89	1.11
D	0.0150	0.0200	0.37	0.5
G	0.0701	0.0807	1.78	2.04
H	0.0005	0.0040	0.013	0.100
J	0.0034	0.0070	0.085	0.177
K	0.007	—	0.018	—
L	0.0350	0.0401	0.89	1.02
S	0.0830	0.1039	2.10	2.64
V	0.0177	0.0236	0.45	0.60

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