



- ★ Low drain-source ON resistance
- ★ Green Device Available
- ★ ESD Protected Embedded

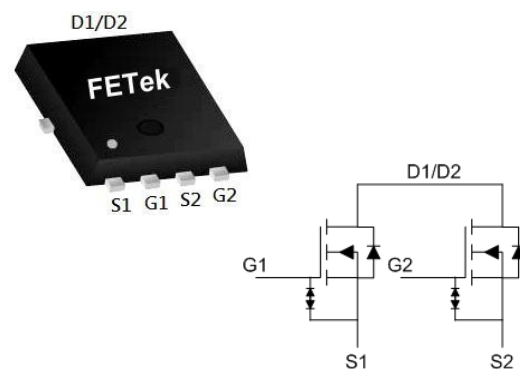
Product Summary

BVDSS	RDSON	ID
20V	10.5mΩ	12A

Description

The FKBE2738 is the low RDSON trenched N-CH MOSFETs with robust ESD protection. This product is suitable for Lithium-ion battery pack applications.

The FKBE2738 meet the RoHS and Green Product requirement with full function reliability approved.

PRPAK3X3 NEP Pin Configuration

Absolute Maximum Ratings

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

Thermal Data

Symbol	Parameter	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	62.5	$^\circ\text{C}/\text{W}$

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

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

Diode Characteristics

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

Note :

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The power dissipation is limited by 150°C junction temperature.
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

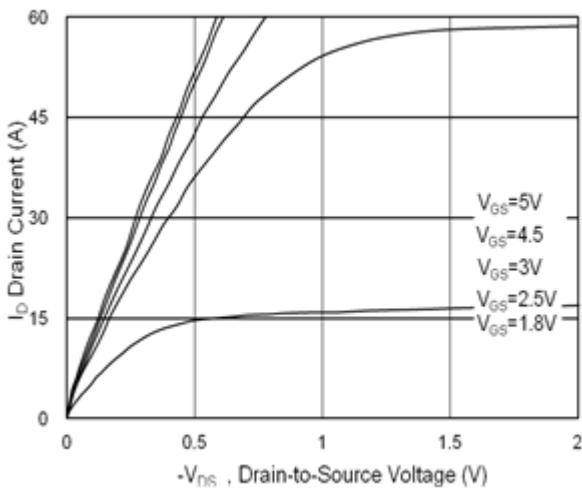


Fig.1 Typical Output Characteristics

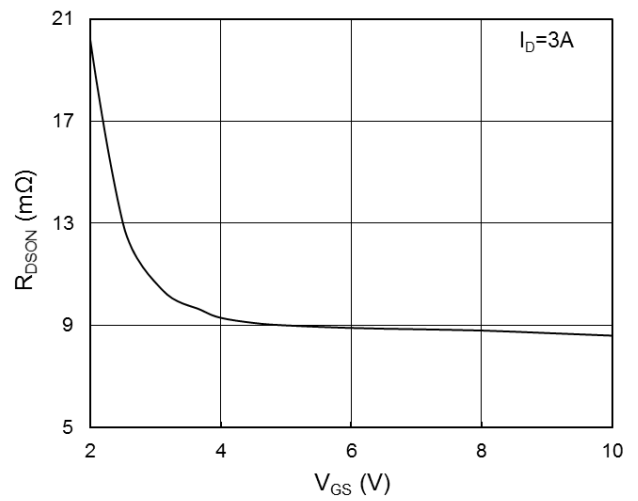


Fig.2 On-Resistance vs G-S Voltage

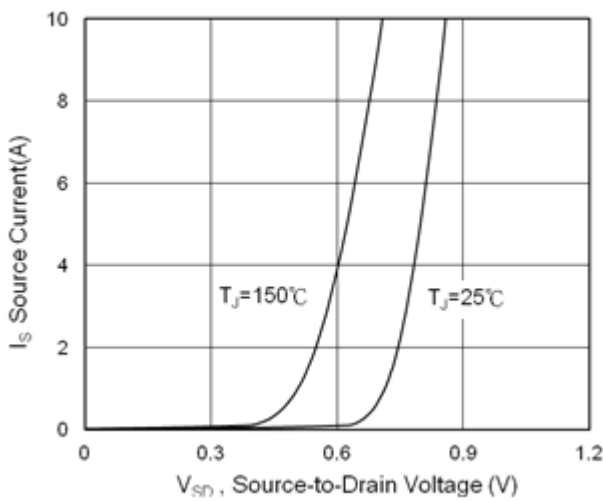


Fig.3 Source Drain Forward Characteristics

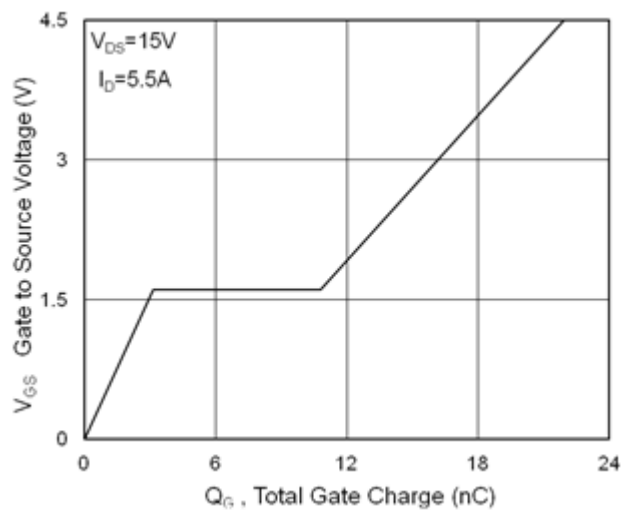


Fig.4 Gate-Charge Characteristics

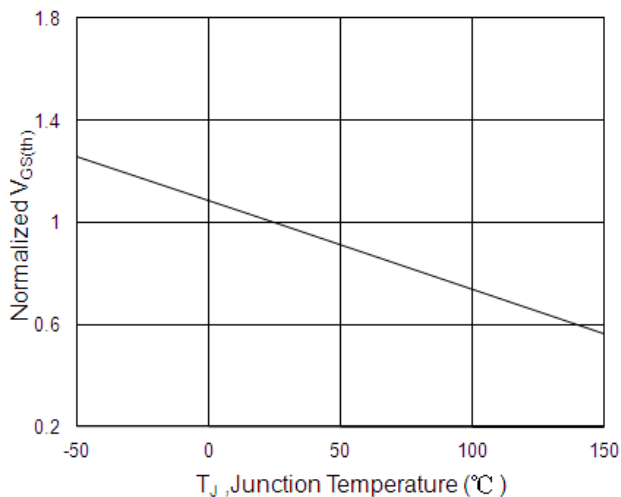


Fig.5 Normalized $V_{GS(th)}$ vs T_J

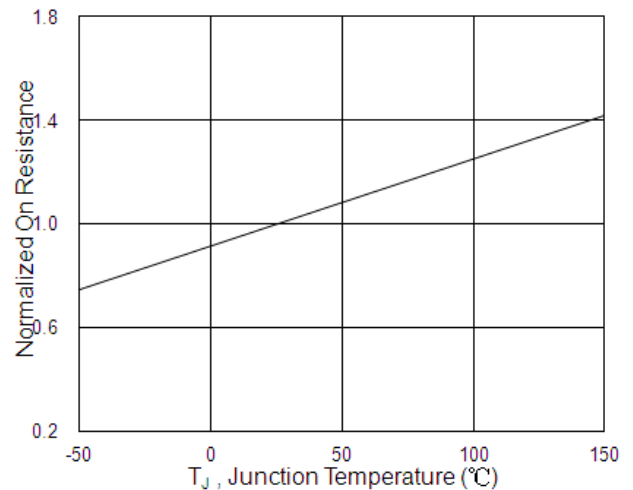


Fig.6 Normalized $R_{DS(on)}$ vs T_J

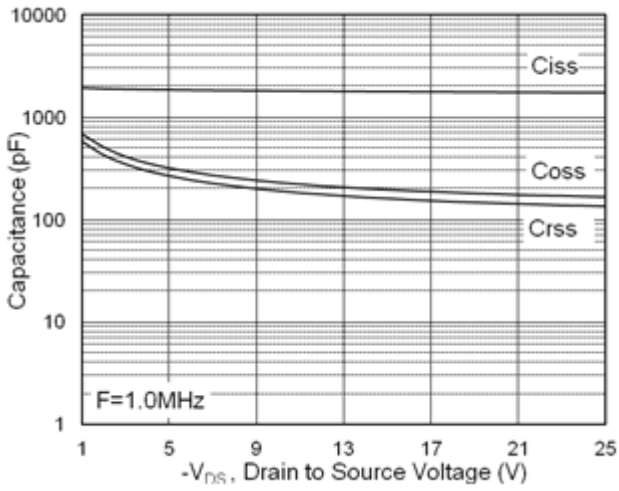


Fig.7 Capacitance

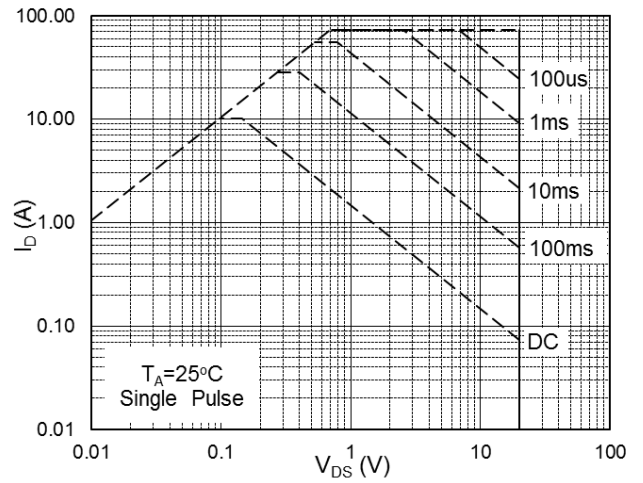


Fig.8 Safe Operating Area

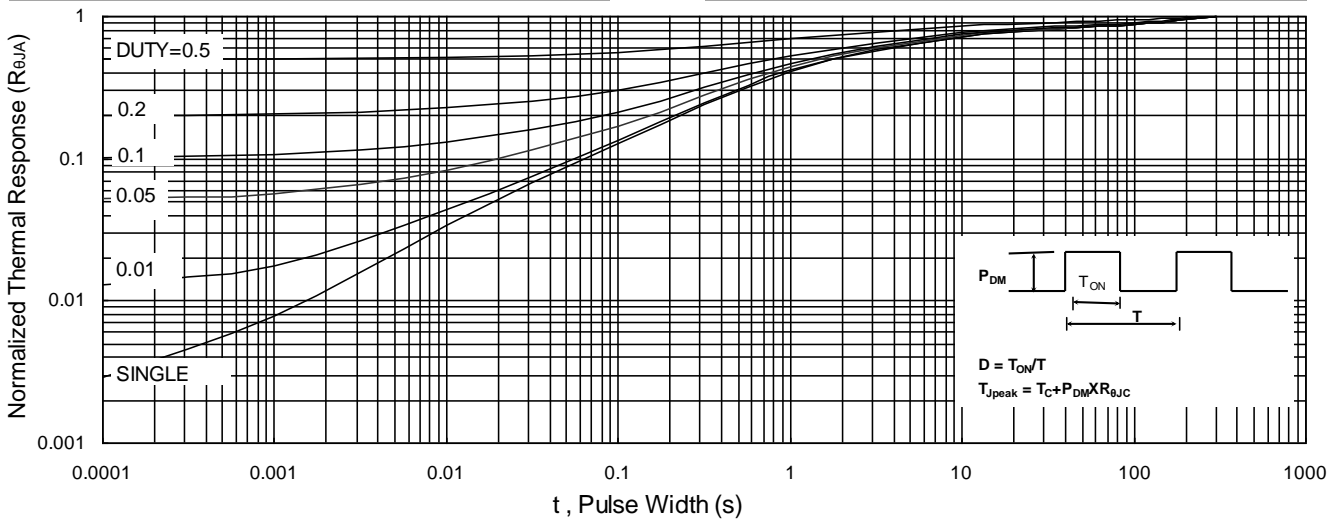


Fig.9 Normalized Maximum Transient Thermal Impedance

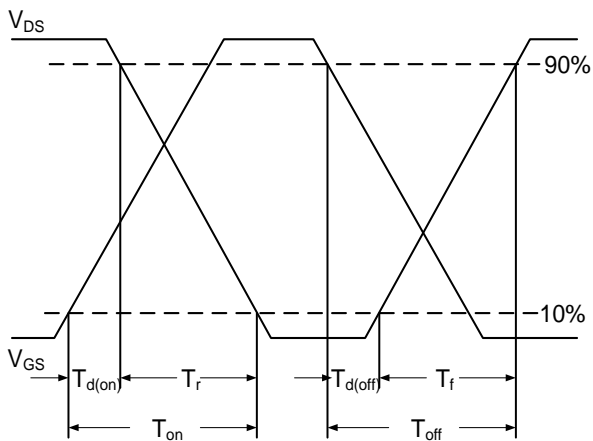


Fig.10 Switching Time Waveform

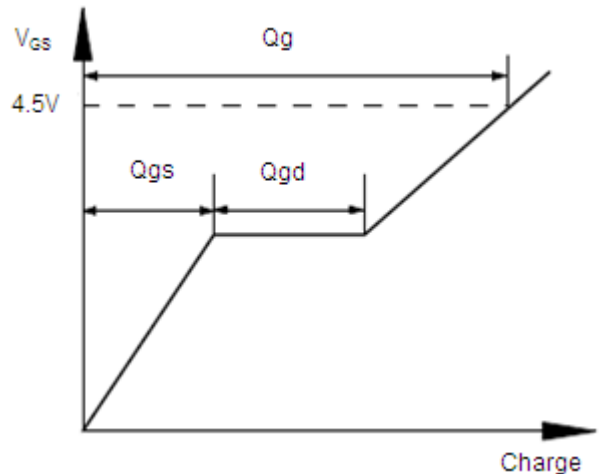
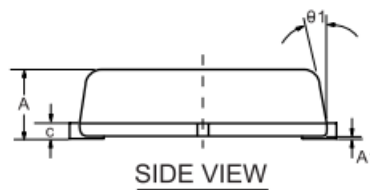
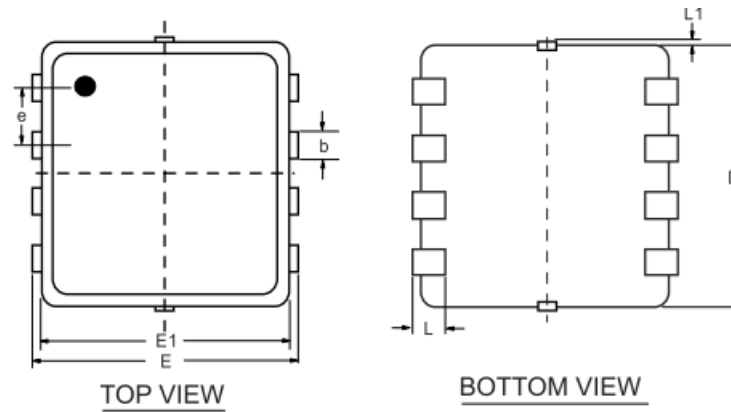
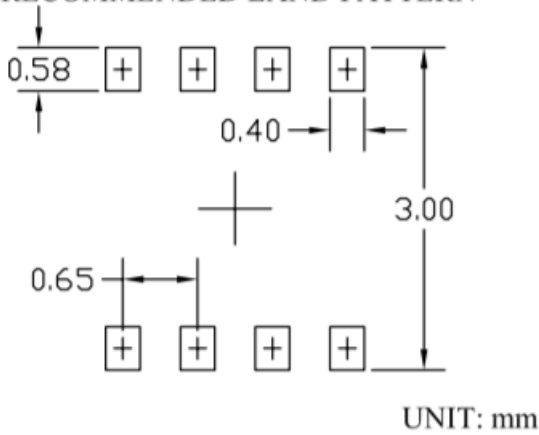


Fig.11 Gate Charge Waveform

PRPAK3X3 NEP Package Outline Dimensions

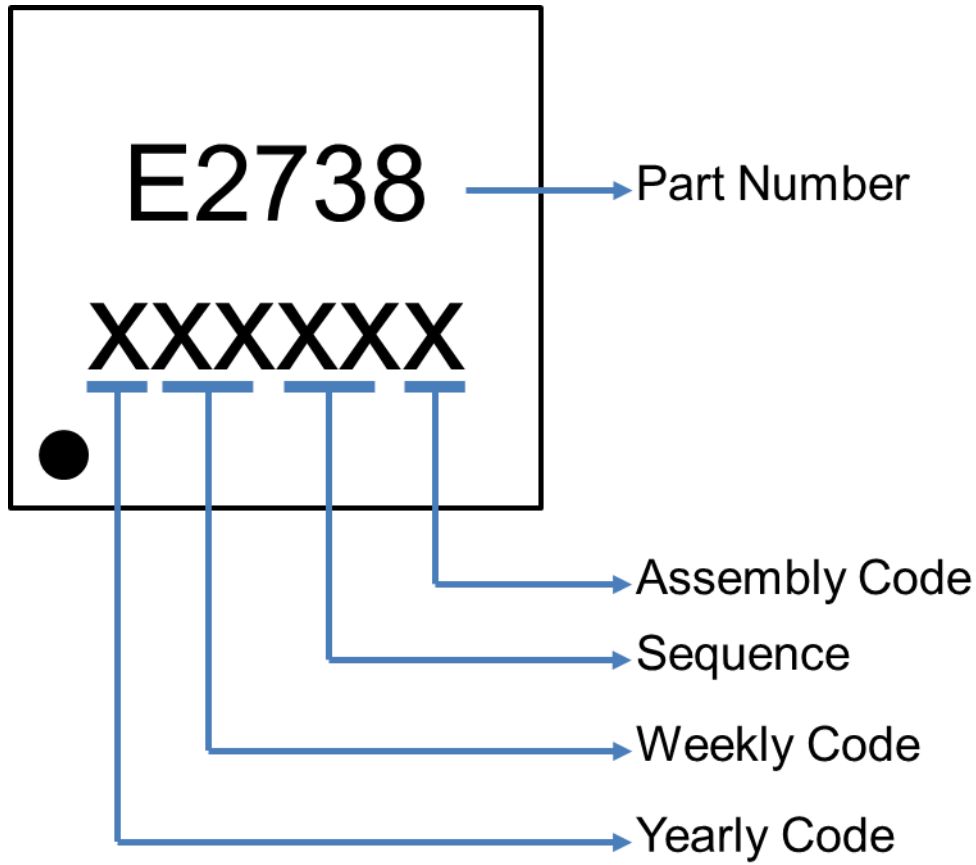


RECOMMENDED LAND PATTERN



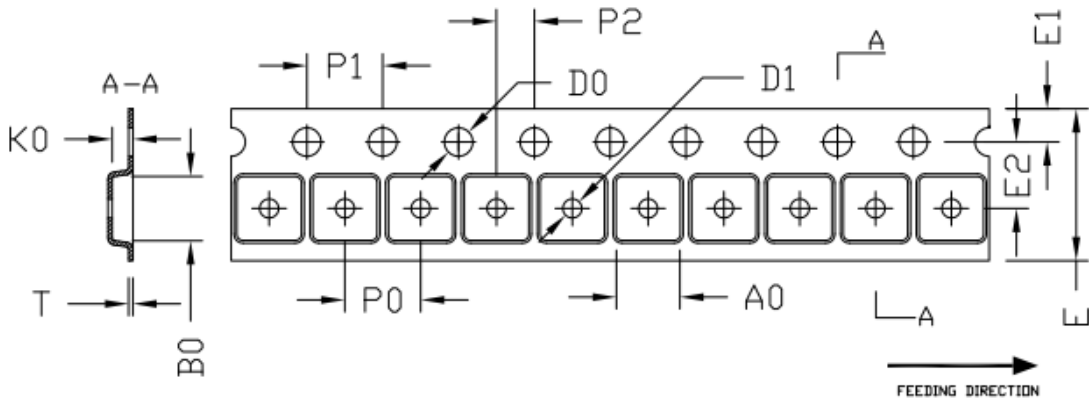
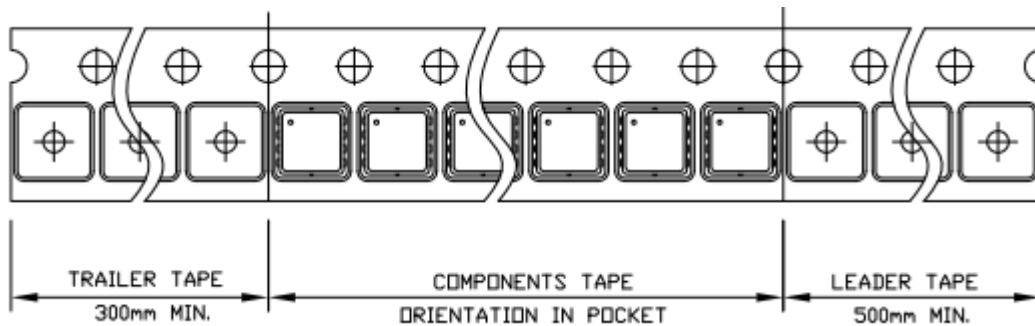
SYMBOLS	MILLIMETERS		
	MIN	NOM	MAX
A	0.700	0.800	0.900
A1	0.000	—	0.050
b	0.240	0.300	0.350
c	0.080	0.152	0.250
D	2.800	2.900	3.000
E	2.700	2.800	2.900
E1	2.200	2.300	2.400
e	0.650 BSC		
L	0.200	0.375	0.450
L1	0.000	—	0.100
θ1	0°	10°	12°

Marking Instruction



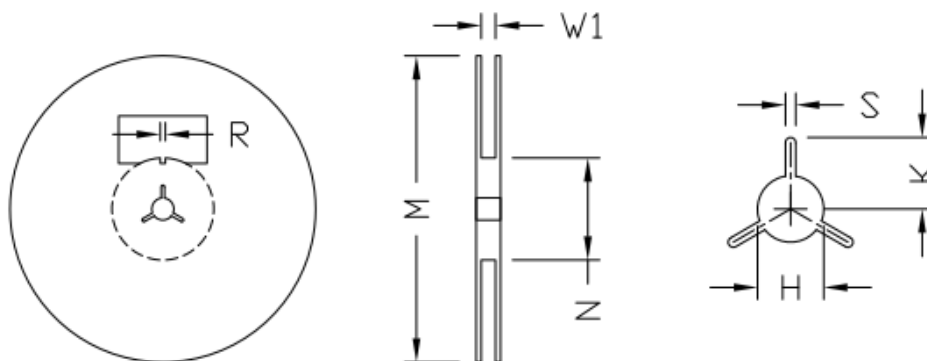
PRPAK3X3 NEP Tape and Reel Data

Leader / Trailer & Orientation



UNIT: MM

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
DFN3x3	3.35	3.20	1.10	1.50	1.00	8.00	1.75	3.50	4.00	4.00	2.00	0.23
DFN3x2	±0.10	±0.10	±0.10	+0.10	+0.25	+0.30	±0.10	±0.05	±0.10	±0.10	±0.05	±0.020
DFN2x3				-0.00	-0.00	-0.10						



UNIT: MM

TAPE SIZE	REEL SIZE	M	N	W1	H	S	K	R
8	φ180	φ180.0	60.0	8.4	13.0	1.5	13.5	3.0
		±0.50	±0.50	+1.5 -0	±0.20	MIN.	MIN.	±0.50