

Descriptions

This is 40V 74A N-Channel Enhancement Mode MOSFET in a PDFN3X3-8L Package.

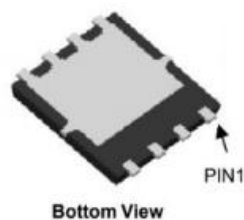
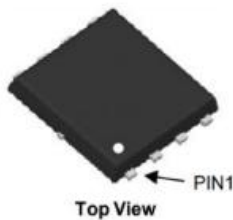
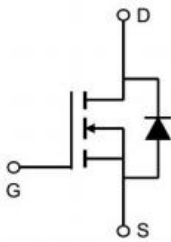
Features

- Advanced Trench Process Technology
- Low Threshold Voltage
- Fast Switching Speed
- Halogen-Free & Lead-Free

Applications

- Motor/Body Load Control
- Load Switch
- DC-DC converters

Equivalent Circuit & Pinning



Absolute Maximum Ratings(Ta=25°C)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹²³	I_D	74	A
Power Dissipation ¹²	P_{tot}	50	W
Avalanche Current	I_{AS}	27	A
Single Pulse Avalanche Energy L=0.3mH	E_{AS}	150	mJ
Operating Junction	T_J	-55~ 150	°C
Storage Temperature Range	T_{stg}	-55~ 150	°C

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient ²⁾	$R_{\theta JA}$	47.7	°C/W
Thermal Resistance from Junction to Case ²⁾	$R_{\theta JC}$	3	°C/W

Notes:

- 1). The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
- 2). Surface-mounted on FR4 board using a 650 mm² , 2 oz. Cu pad.
- 3). Continuous DC current rating. Maximum current for pulses as long as 1 second is higher but is dependent on pulse duration and duty cycle

Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $V_{GS}=0V$, $I_D=250\mu A$	$B_{V_{DS}}$	40			V
Drain-Source Leakage Current at $V_{DS}=40V$, $V_{GS}=0V$	I_{DSS}			1	μA
Gate Leakage Current at $V_{DS}=0V$, $V_{GS}=\pm 20V$	I_{GSS}			± 100	nA
Gate-Source Threshold Voltage at $V_{DS}=V_{GS}$, $I_D=250\mu A$	$V_{GS(th)}$	1		2.5	V
Drain-Source On-State Resistance at $V_{GS}=10V$, $I_D=30A$ at $V_{GS}=4.5V$, $I_D=20A$	$R_{DS(on)}$		4.5 6.5	6 9	m Ω
DYNAMIC PARAMETERS					
Gate resistance at $V_{DS}=0V$, $f=1MHz$	R_g		2.5		Ω
Forward Transconductance at $V_{DD}=5V$, $I_D=6A$	g_{fs}		72		S
Input Capacitance at $V_{GS}=0V$, $V_{DS}=25V$, $f=1MHz$	C_{iss}		1300		pF
Output Capacitance at $V_{GS}=0V$, $V_{DS}=25V$, $f=1MHz$	C_{oss}		530		pF
Reverse Transfer Capacitance at $V_{GS}=0V$, $V_{DS}=25V$, $f=1MHz$	C_{rss}		22		pF
Gate charge total at $V_{DS}=20V$, $I_D=35A$, $V_{GS}=10V$	Q_g		2.5		nC
Gate to Source Gate Charge at $V_{DS}=20V$, $I_D=35A$, $V_{GS}=10V$	Q_{gs}		4.7		nC
Gate to Drain Charge at $V_{DS}=20V$, $I_D=35A$, $V_{GS}=10V$	Q_{gd}		3		nC
Turn-On Delay Time at $V_{GS}=10V$, $V_{DS}=20V$, $I_D=35A$	$t_{d(on)}$		9.3		nS
Turn-On Rise Time at $V_{GS}=10V$, $V_{DS}=20V$, $I_D=35A$	t_r		97		nS
Turn-Off Delay Time at $V_{GS}=10V$, $V_{DS}=20V$, $I_D=35A$	$t_{d(off)}$		17		nS
Turn-Off Fall Time at $V_{GS}=10V$, $V_{DS}=20V$, $I_D=35A$	t_f		4		nS
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at $I_S=40A$, $V_{GS}=0V$	V_{SD}			1.2	V
Reverse Recovery Time at $I_S=35A$, $di/dt=100A/s$	t_{rr}		29		A
Reverse Recovery Charge at $I_S=35A$, $di/dt=100A/s$	Q_{rr}		12		A

Electrical Characteristic Curve

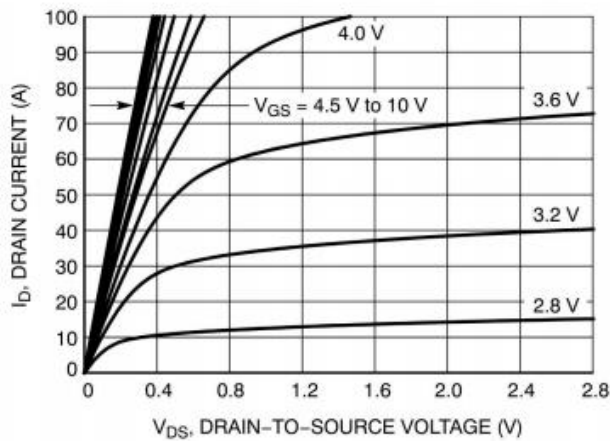


Figure 1. On-Region Characteristics

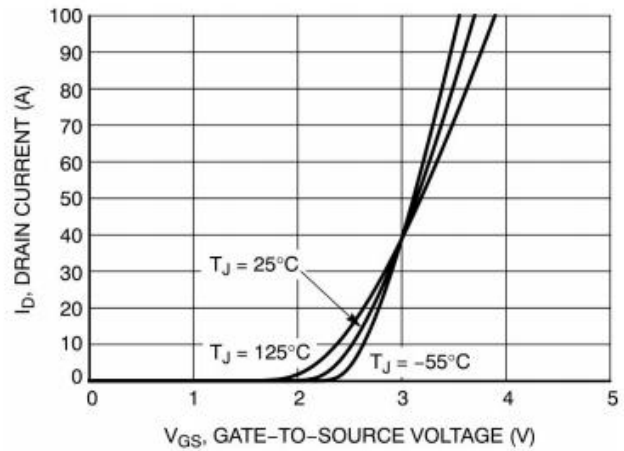


Figure 2. Transfer Characteristics

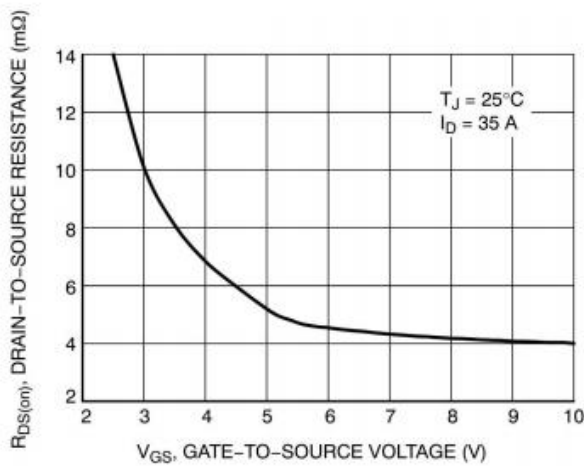


Figure 3. On-Resistance vs. Gate-to-Source Voltage

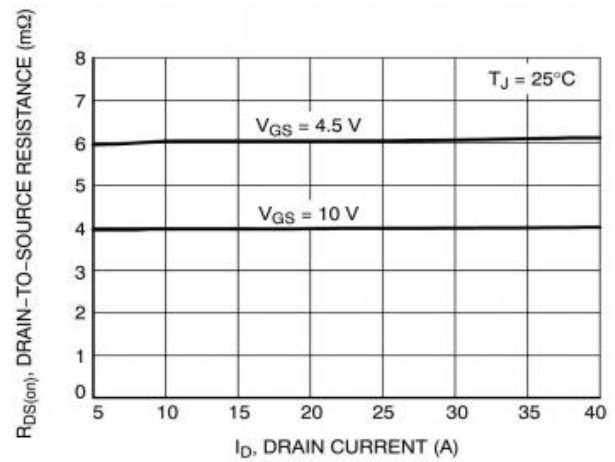


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

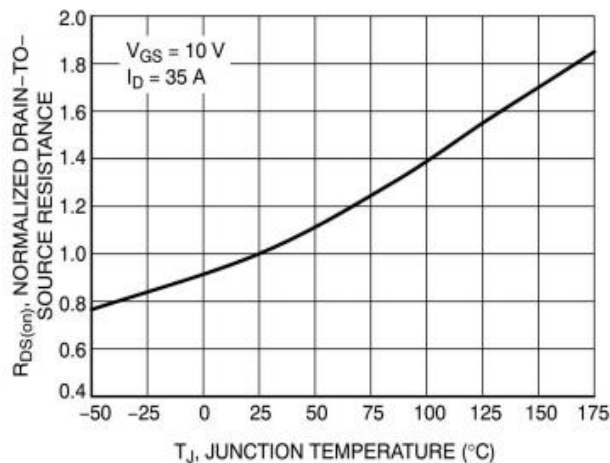


Figure 5. On-Resistance Variation with Temperature

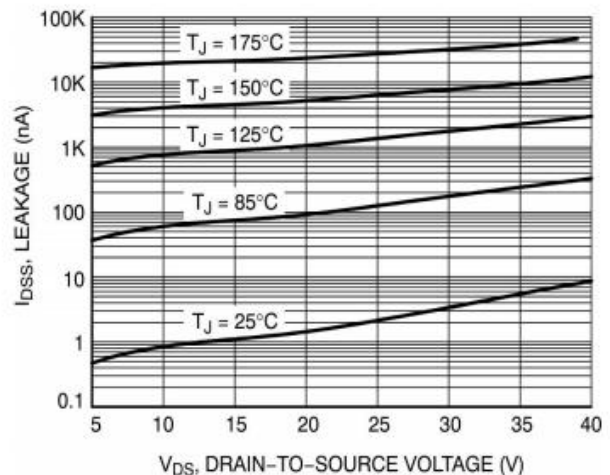


Figure 6. Drain-to-Source Leakage Current vs. Voltage

Electrical Characteristic Curve

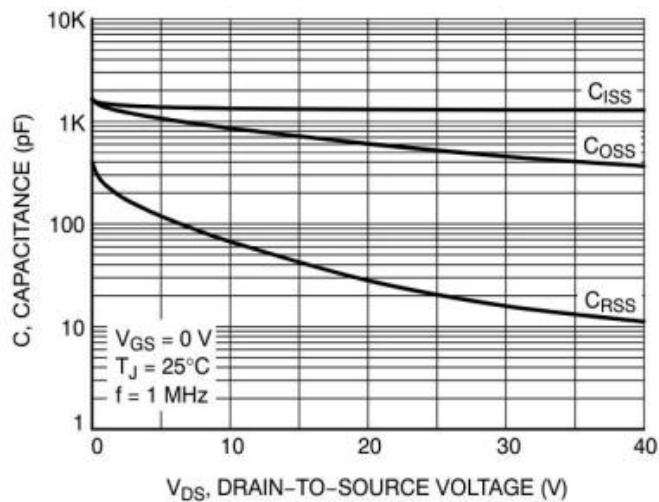


Figure 7. Capacitance Variation

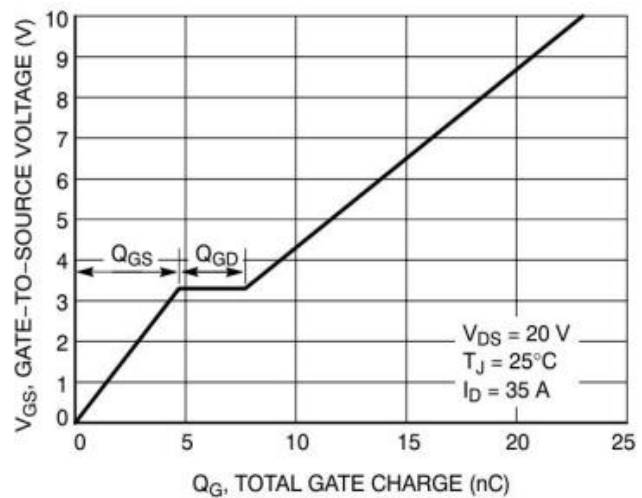


Figure 8. Gate-to-Source vs. Total Charge

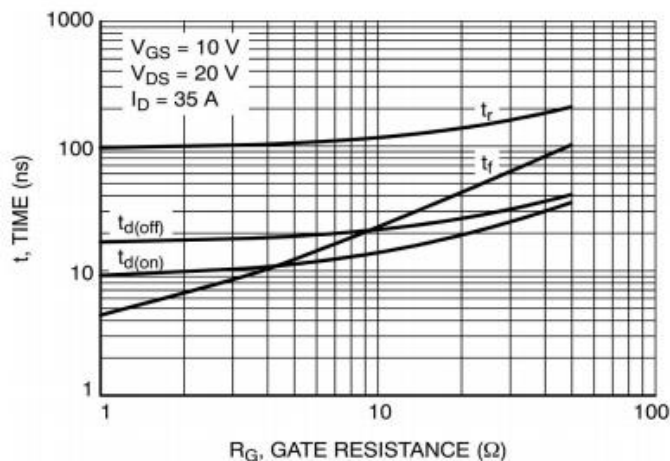


Figure 9. Resistive Switching Time Variation

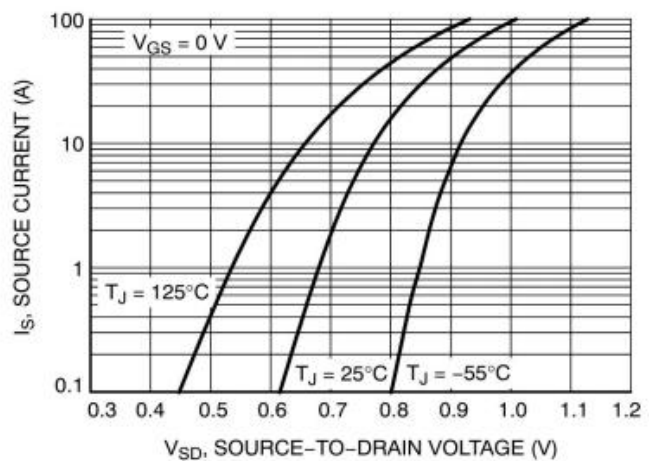


Figure 10. Diode Forward Voltage vs. Current

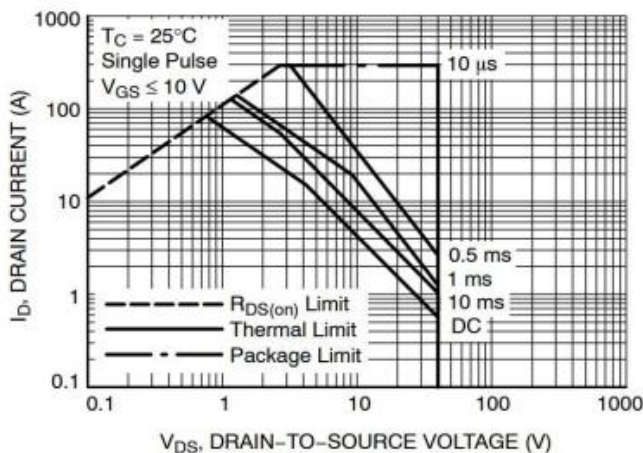


Figure 11. Maximum Rated Forward Biased Safe Operating Area

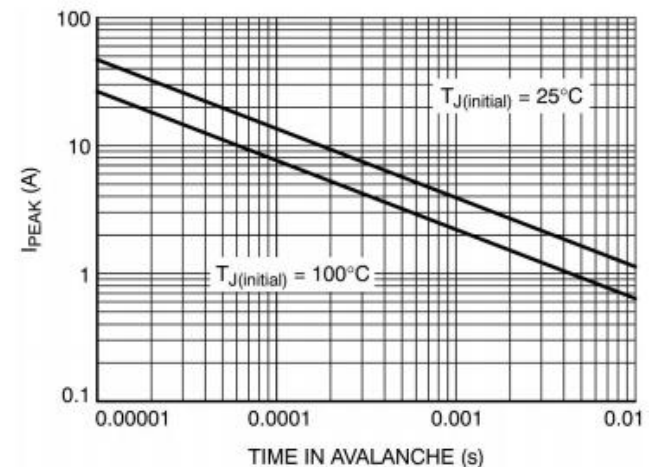


Figure 12. Maximum Drain Current vs. Time in Avalanche

Electrical Characteristic Curve

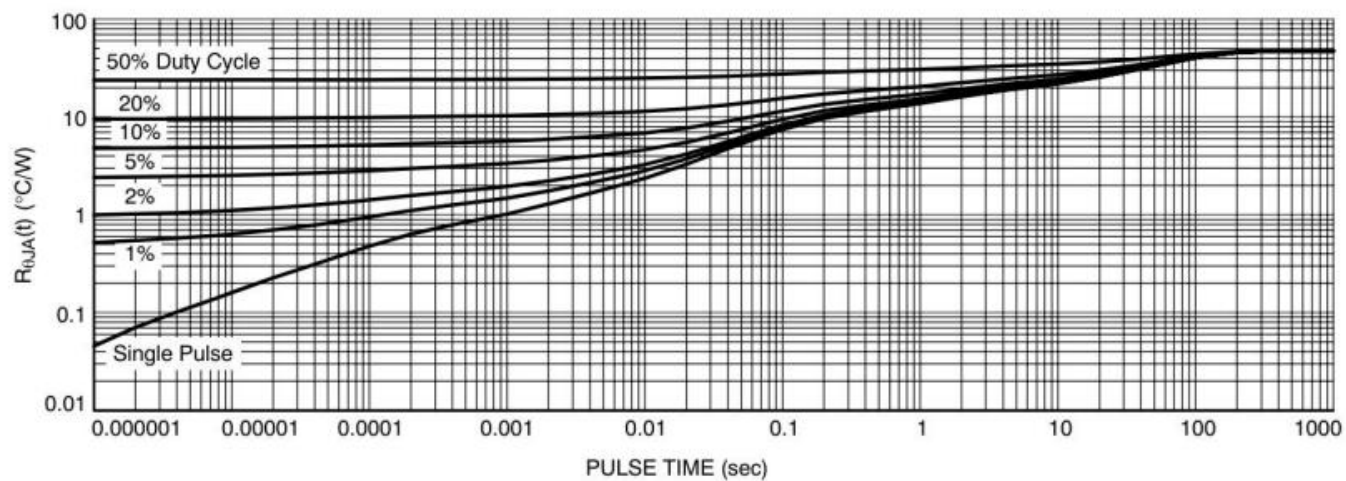


Figure 13. Thermal Response

Test Circuits

Fig.1-1 Switching times test circuit

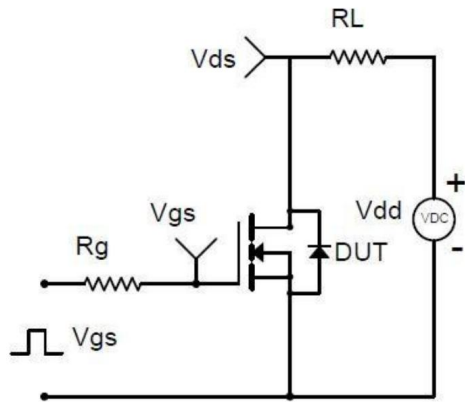


Fig.1-2 Switching Waveform

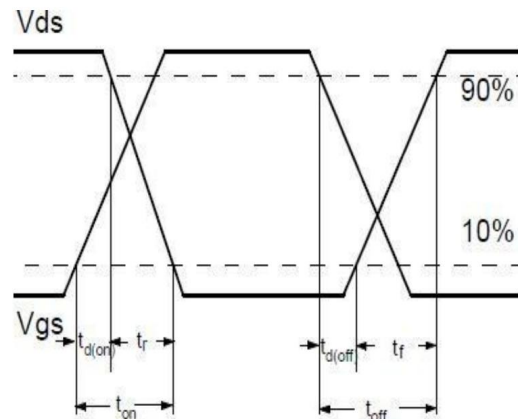


Fig.2-1 Gate charge test circuit

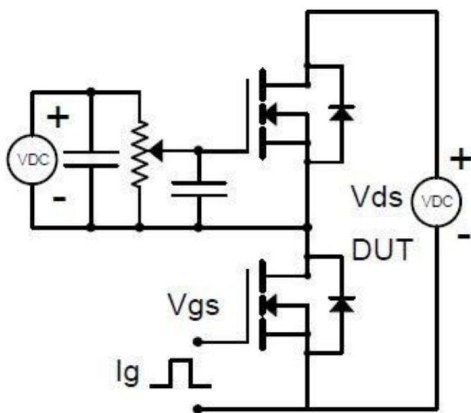


Fig.2-2 Gate charge waveform

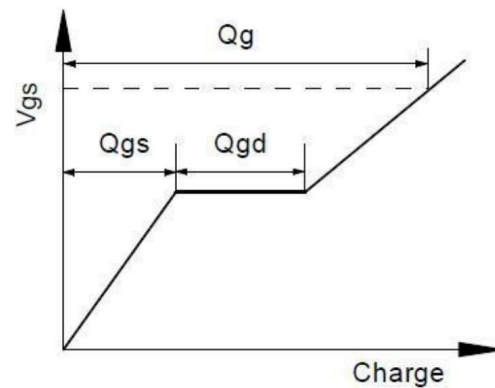


Fig.3-1 Avalanche test circuit

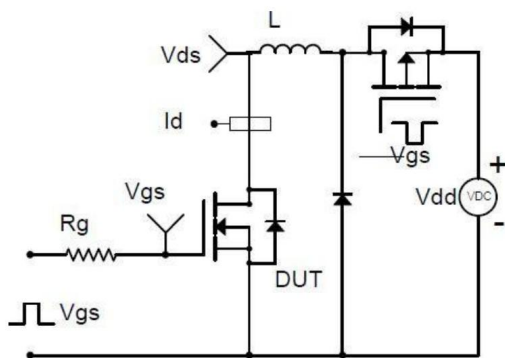
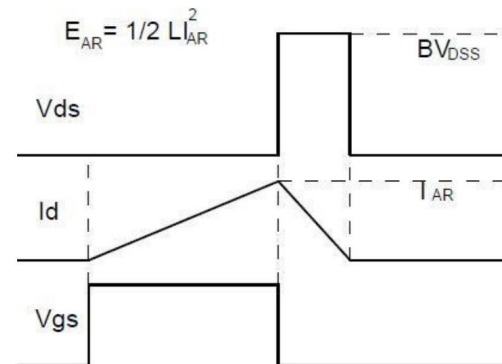


Fig.3-2 Avalanche waveform

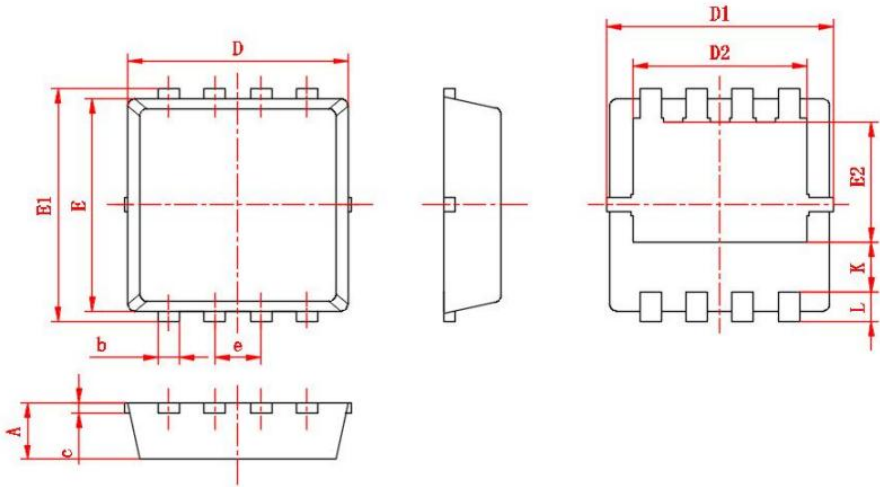


Marking Instructions



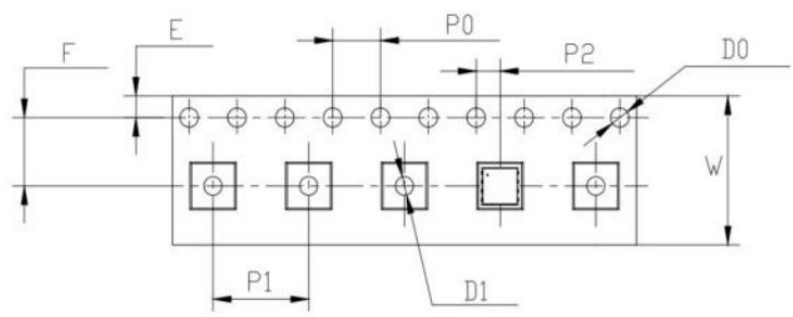
Note:
42N04: Product Type
YWWXXX: Lot No. Code, code change with Lot No

Package Outline Dimensions

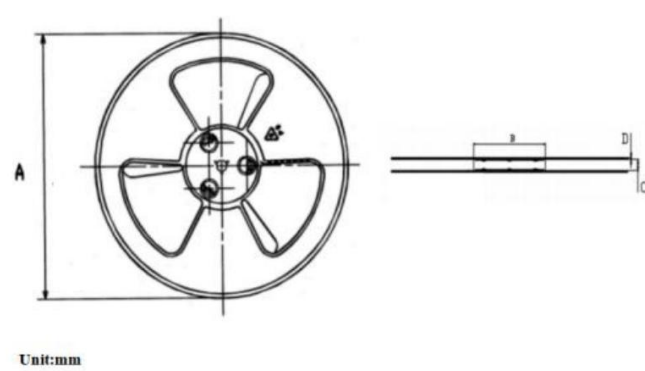


符号	尺寸		符号	尺寸		符号	尺寸	
	Min	Max		Min	Max		Min	Max
A	0.7	0.9	E	2.9	3.1	e	(0.65)	
D	3.0	3.2	E1	3.1	3.5	b	0.25	0.35
D1	3.0	3.4	E2	1.55	1.95	c	0.1	0.2
D2	2.25	2.65	K	(0.65)		L	0.3	0.55

Emboss Carrie Tape&Ree



Symbol	Dimension in Millimeters
Tape	
D0	1.50+0.10/-0.00
E	1.75±0.10
F	5.50±0.10
P0	4.00±0.10
P1	8.00±0.10
P2	2.00±0.10
W	12.00+0.3/-0.1



Symbol	A	B	C	D
通用尺寸	Ø331.00	101.0	13.0	2.10
公差	±1	±2	±0.5	±0.2