

DFN2020-6 30V 9.5mΩ 13A N-Channel MOSFET

MOSFET Product Summary

V_{DS}	$R_{DS(on)}$ (Typ.)	I_D
30V	7.5mΩ @10V	13A
	9.5mΩ @4.5V	

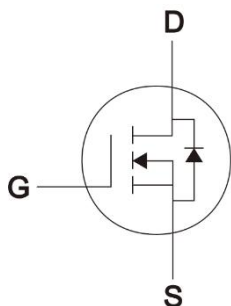
Description

The PM03N13D226 uses advanced Trench technology and designs to provide excellent $R_{DS(on)}$ with low gate charge. This device is suitable for use in PWM, load switching and general purpose applications.

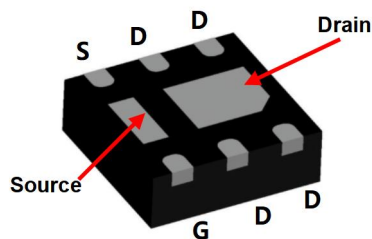
Features

- Surface-mounted package
- Low Thermal Resistance
- Trench Technology

Dimensions and Pin Configuration



Circuit diagram



Bottom View

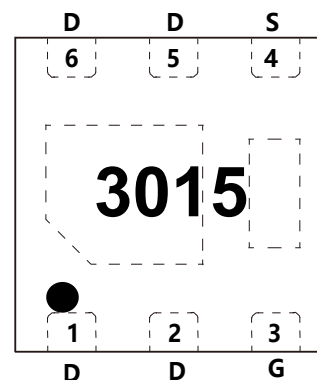
Mechanical Characteristics

- Package: DFN2020-6
- Case Material: "Green" Molding Compound
- Marking Information: See Below

Applications

- Battery management
- DC-DC Converter
- Low-side load switch
- Switching circuits

Marking Information



3015 = Device Marking Code

Ordering Information

Part Number	Shipping	Reel Size
PM03N13D226	3000/Tape & Reel	7 inch

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current ^(note2,6)	I _D	13	A
Drain Current(Pulse) ^(note3)	I _{DM}	90	A
Power Dissipation (T _C = 25°C) ^(note2)	P _D	2	W
Thermal Resistance from Junction to Ambient ^(note2,4)	R _{θJA}	62.5	°C/W
Avalanche Current ^(note5)	I _{AS}	21	A
Avalanche Energy ^(note5)	E _{AS}	22	mJ
Soldering temperature, wave soldering only allowed at leads(1.6mm from case for 10s)	T _{sold}	260	°C
Junction Temperature	T _J	-55~ +150	°C
Storage Temperature	T _{STG}	-55~ +150	°C

Electrical Characteristics (T_A=25°C unless otherwise specified)

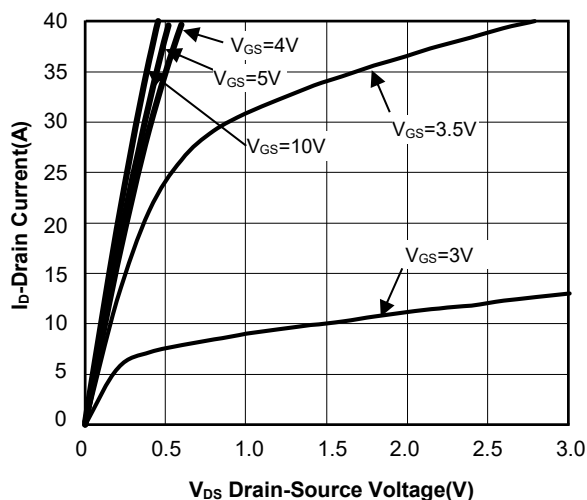
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} = 0V, I _D =250μA	30	-	-	V
Zero gate voltage drain current	I _{DSS}	V _{DS} =30V, V _{GS} = 0V	-	-	1	μA
Gate-source leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V	-	-	±100	nA
Gate threshold voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.0	-	2.0	V
Drain-source on-state resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 10A	-	7.5	8.5	mΩ
		V _{GS} = 4.5V, I _D = 10A	-	9.5	12	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =20A	-	60	-	S
Diode Forward Voltage	V _{SD}	I _S =1A, V _{GS} =0V	-	0.7	1.0	V
Diode Characteristics						
Reverse Recovery Time	t _{rr}	I _{SD} =10A, di/dt=100A/us	-	24	-	nS
Reverse Recovery Charge	Q _{rr}		-	30	-	nC

Dynamic characteristics						
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V, f=1MHz	-	1550	-	pF
Output Capacitance	C _{oss}		-	160	-	
Reverse Transfer Capacitance	C _{rss}		-	125	-	
Turn-on delay time	t _{d(on)}	V _{DS} =15V,V _{GS} =10V,R _G =3 Ω ,I _D =20A	-	10	-	nS
Turn-on Rise time	t _r		-	7	-	
Turn-off delay time	t _{d(off)}		-	36	-	
Turn-off Fall time	t _f		-	12	-	
Gate Charge characteristics ^b						
Gate Total Charge	Q _g	V _{GS} =10V, V _{DS} =15V, I _{DS} =20A	-	28	-	nC
Gate-Source charge	Q _{gs}		-	5.4	-	
Gate-Drain charge	Q _{gd}		-	4.8	-	

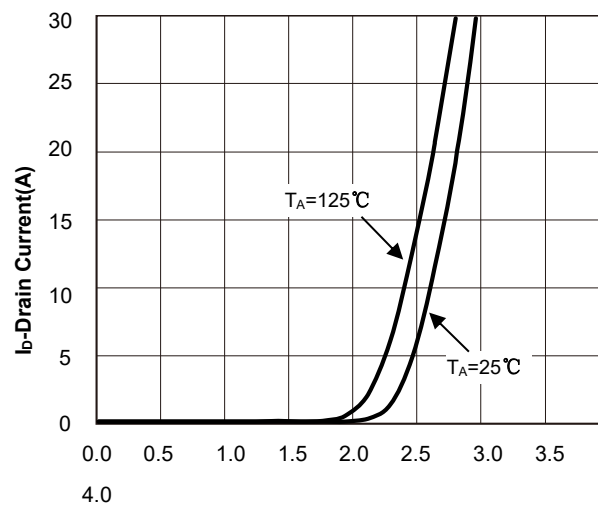
Notes:

- 1、Conditions out of those range listed in “absolute maximum ratings” may cause permanent damages to the device. In spite of the limits above, functional operation conditions of the device should within the ranges listed in “recommended operating Conditions”. Exposure to absolute-maximum-rated conditions for prolonged periods may affect device reliability.
- 2、Mounted on FR-4 material with 1inch², 2oz. Copper
- 3、Test condition 380us 25°C
- 4、Thermal resistance from junction to ambient is highly dependent on PCB layout
- 5、 $L=0.1Mh, V_{GS}=10V, R_g=25\Omega, V_{DS}=15V$
- 6、Rated according to $R_{\theta J}$

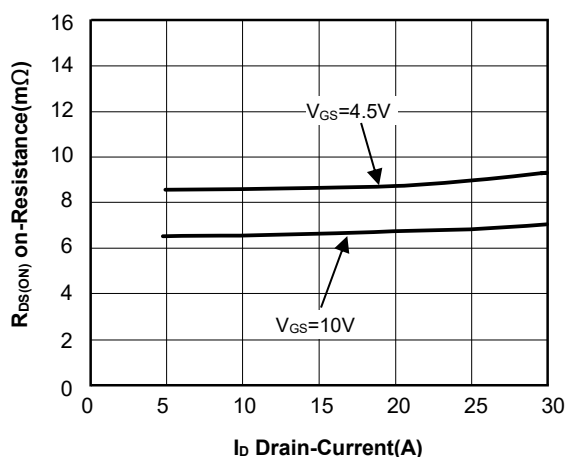
Typical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise specified)



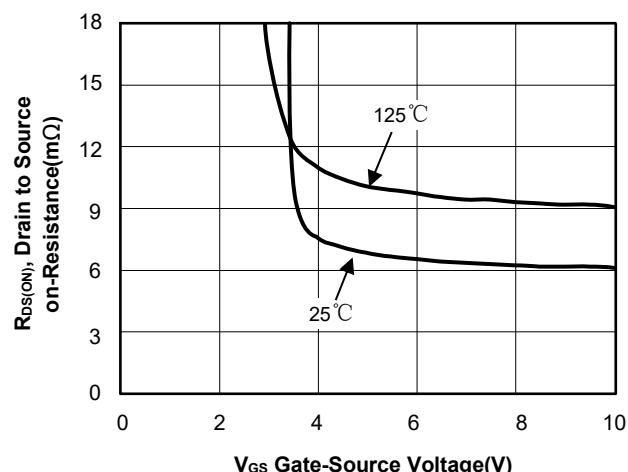
Drain Current vs. Drain-Source Voltage



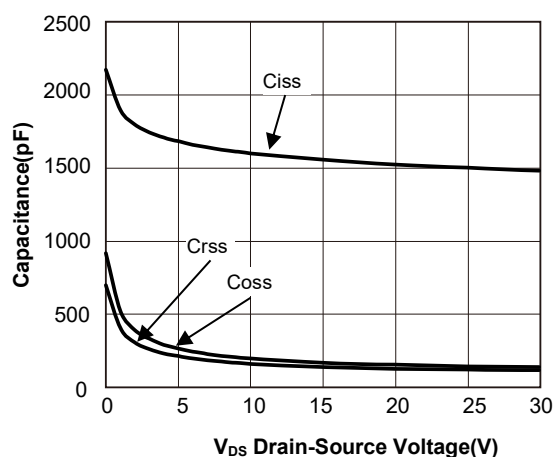
Gate-Source Voltage (V_{GS})



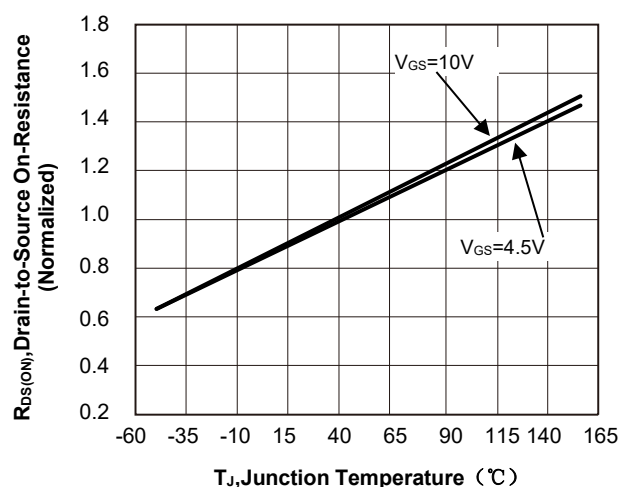
On-Resistance vs. Drain-Current



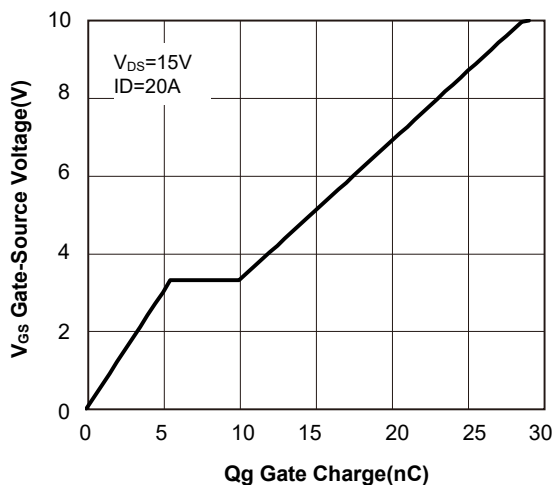
On-Resistance vs. Gate-Source Voltage



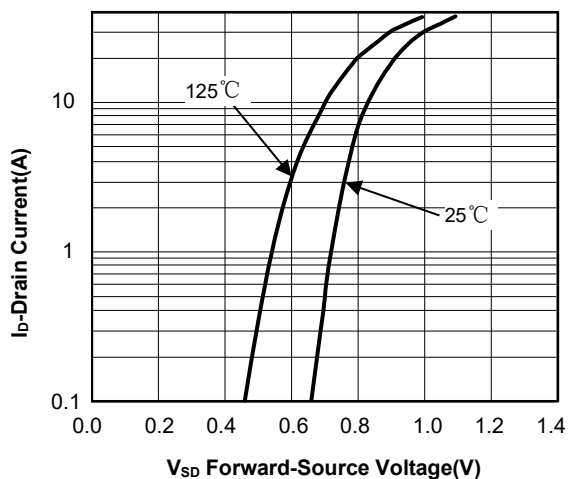
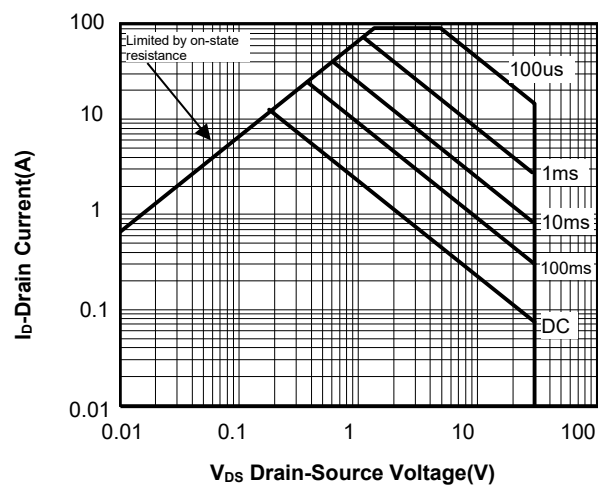
Capacitance vs. Drain-Source Voltage



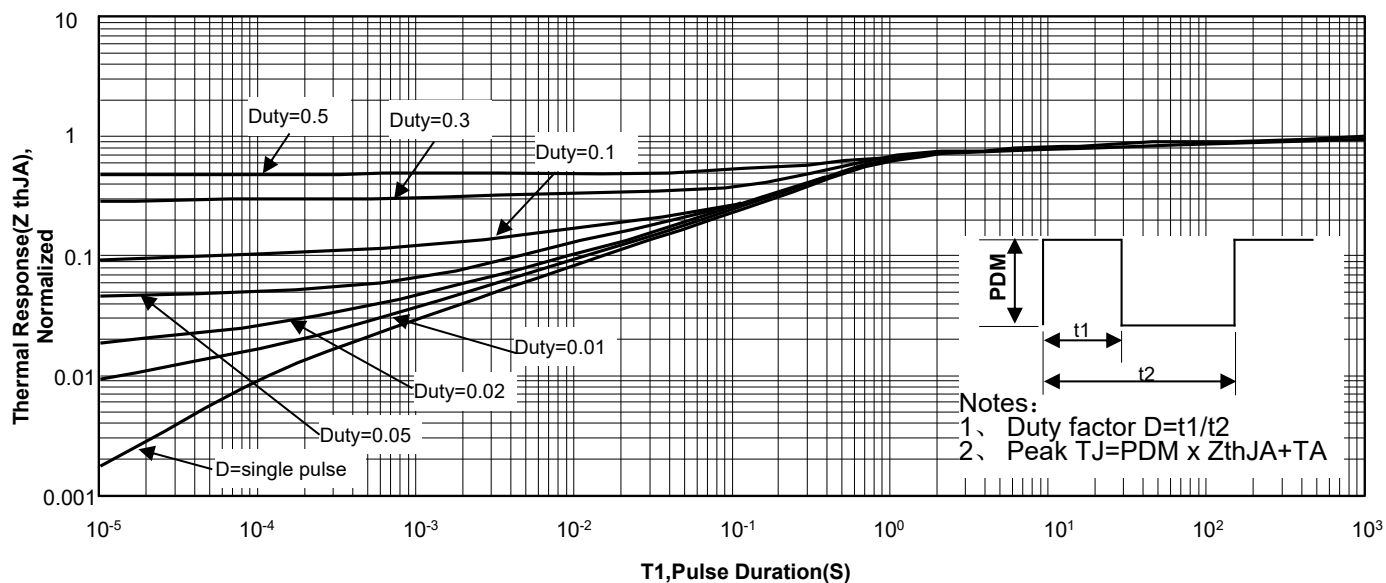
Normalized On-Resistance vs. Temperature



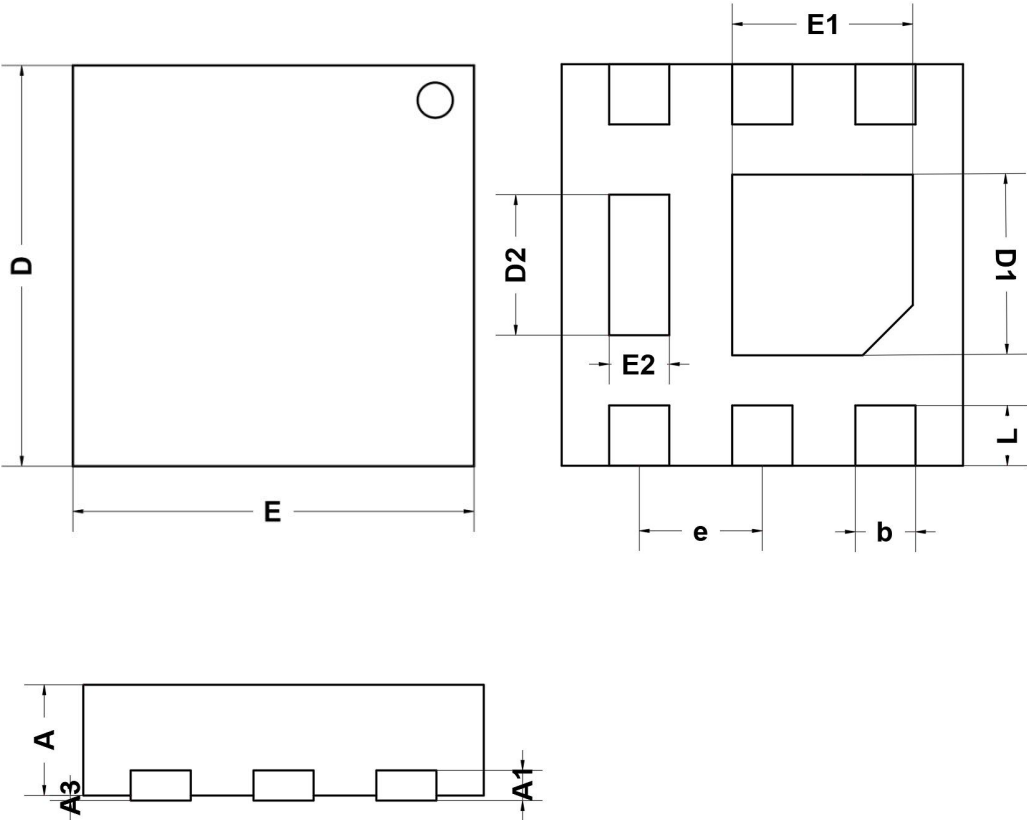
Drain Current vs. Drain-Source Voltage



Drain Current vs. Forward-Source Voltage

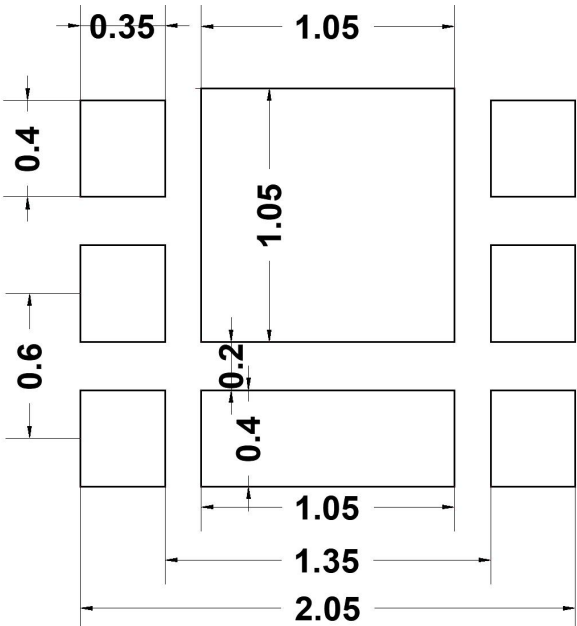


DFN2020-6 Package Outline Drawing



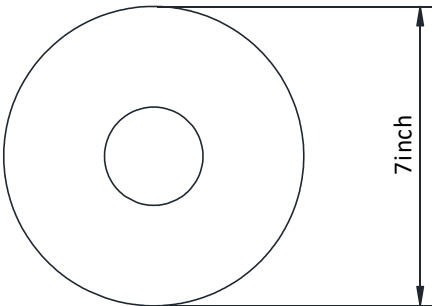
Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	0.5	0.55	0.6
A1	0.15REF		
A3	0.00	0.025	0.05
D	1.95	2.00	2.05
E	1.95	2.00	2.05
D1	0.875	0.90	0.925
E1	0.875	0.90	0.925
D2	0.675	0.70	0.725
E2	0.275	0.30	0.325
L	0.25	0.30	0.35
b	0.3REF		
e	0.65BSC		

Suggested Land Pattern

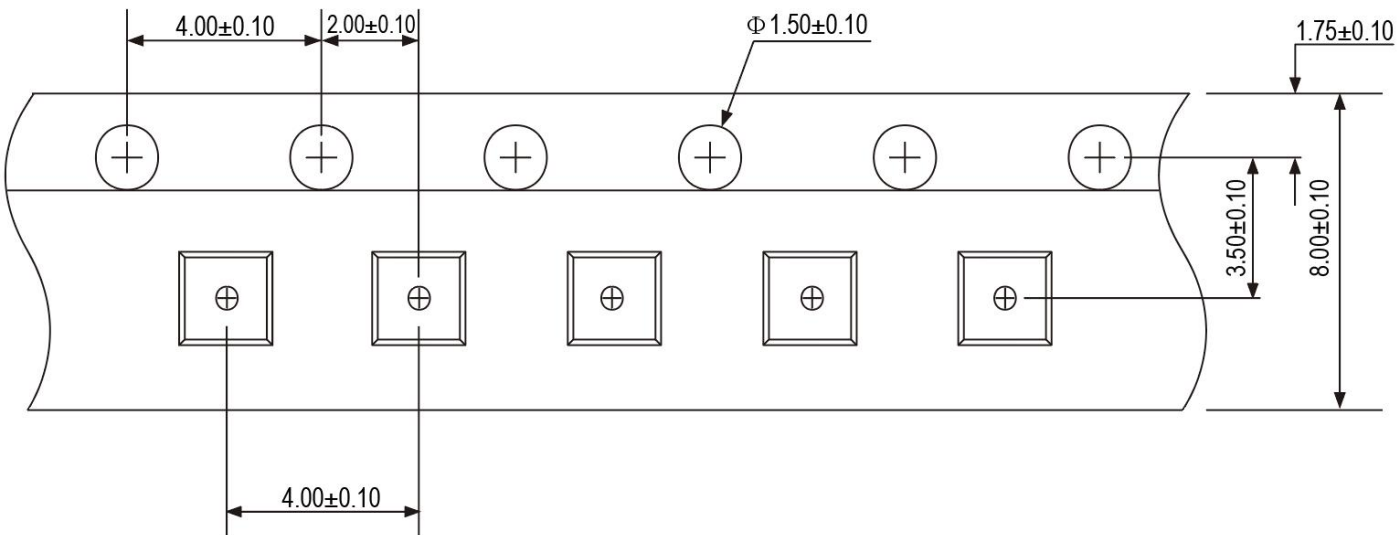


TAPE AND REEL INFORMATION

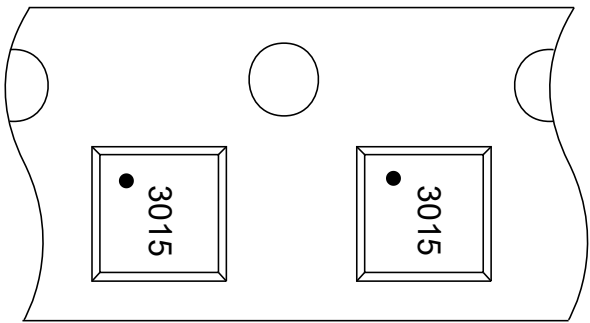
Reel Dimensions



Tape Dimensions



Unit:mm



User Direction of Feed

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