



## SOT-23 Plastic-Encapsulate MOSFETS

### BSS123

### N-Channel Power MOSFET

$V_{DS}$	$R_{DS(ON)}$ (Typ.)	$I_D$
100 V	2.1 $\Omega$ @10V 2.2 $\Omega$ @4.5V	0.17A

### DESCRIPTION

The BSS123 provides excellent  $R_{DS(ON)}$  with low gate charge.

It can be used in a wide variety of applications.

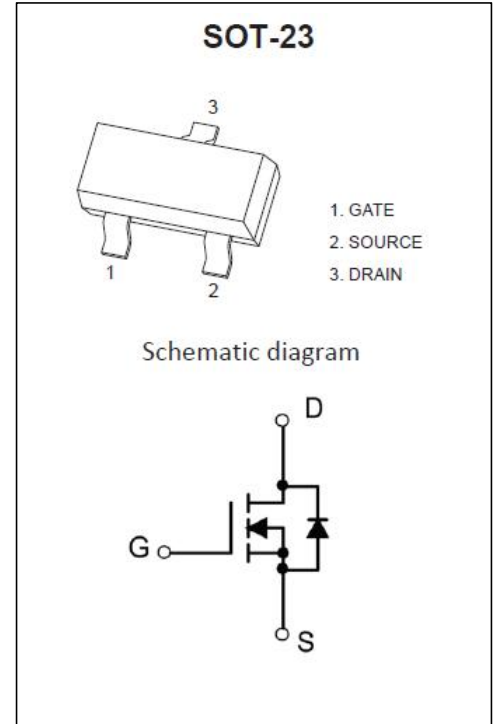
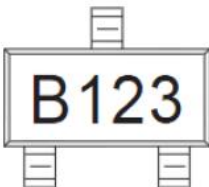
### FEATURES

- Surface Mount Package
- High Density Cell Design for Extremely Low  $R_{DS(ON)}$
- Voltage Controlled Small Signal Switch
- Rugged and Reliable
- AEC-Q101 Qualified

### APPLICATIONS

- Small Servo Motor Controls
- Power MOSFET Gate Drivers
- Switching Application

### MARKING



**ABSOLUTE MAXIMUM RATINGS( $T_J=25^{\circ}\text{C}$  unless otherwise specified)**

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	0.17	A
Pulsed Drain Current ( $t_p=10\mu\text{s}$ )	$I_{DM}$	0.68	A
Power Dissipation	$P_D$	0.42	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357	$^{\circ}\text{C/W}$
Junction Temperature	$T_J$	175	$^{\circ}\text{C}$
Storage Temperature	$T_{STG}$	-55~ +175	$^{\circ}\text{C}$

**MOSFET ELECTRICAL CHARACTERISTICS( $T_C=25^{\circ}\text{C}$  unless otherwise noted)**

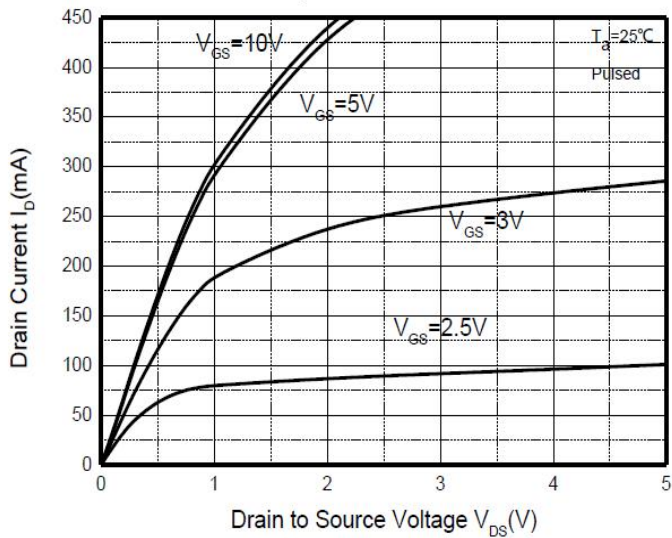
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	100			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 80V, V_{GS} = 0V$			1	$\mu\text{A}$
Gate-body leakage current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
Gate threshold voltage <sup>1</sup>	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	1	1.8	3	V
Drain-source on-resistance <sup>1</sup>	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 0.17A$		2.1	4	$\Omega$
		$V_{GS} = 4.5V, I_D = 0.17A$		2.2	5	
Forward transconductance <sup>1</sup>	$g_{FS}$	$V_{DS} = 10V, I_D = 0.17A$		0.45		S
Diode forward voltage <sup>1</sup>	$V_{SD}$	$I_S = 0.17A, V_{GS} = 0V$		0.8	1.3	V
Dynamic characteristics						
Input Capacitance	$C_{iss}$	$V_{DS} = 25V, V_{GS} = 0V, f = 1\text{MHz}$		32		pF
Output Capacitance	$C_{oss}$			8		
Reverse Transfer Capacitance	$C_{rss}$			2.6		
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{GS} = 10V, V_{DD} = 30V,$ $I_D = 0.28A, R_{GEN} = 50\Omega$		7		ns
Turn-on rise time	$t_r$			6		
Turn-off delay time	$t_{d(off)}$			10		
Turn-off fall time	$t_f$			9		
Total Gate Charge	$Q_g$	$V_{DS} = 10V, I_D = 0.22A, V_{GS} = 10V$		1.5		nC
Gate-Source Charge	$Q_{gs}$			0.16		
Gate-Drain Charge	$Q_{gd}$			0.2		

Notes :

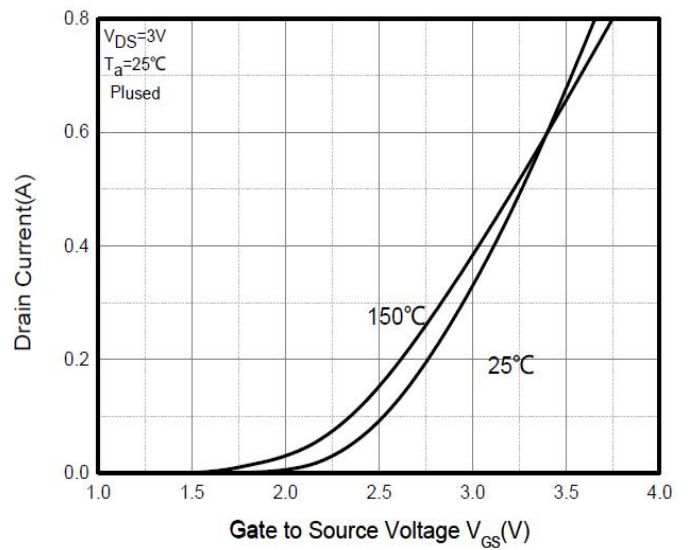
 1. Pulse Test : Pulse Width =300 $\mu\text{s}$ , duty cycle  $\leq 2\%$ .

# Characteristics Curve:

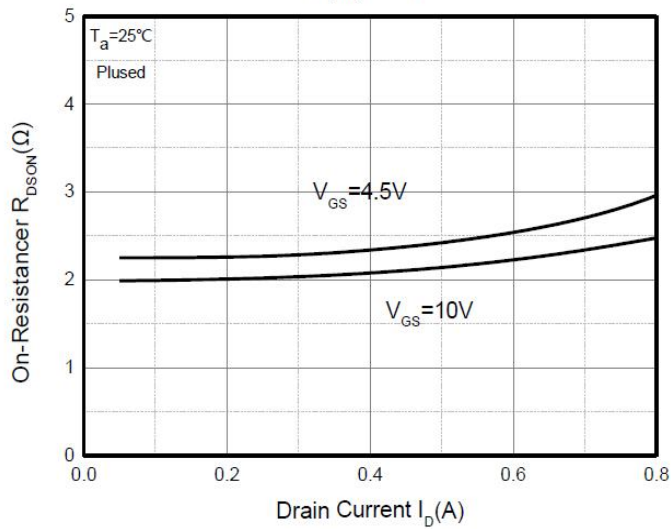
Output Characteristics



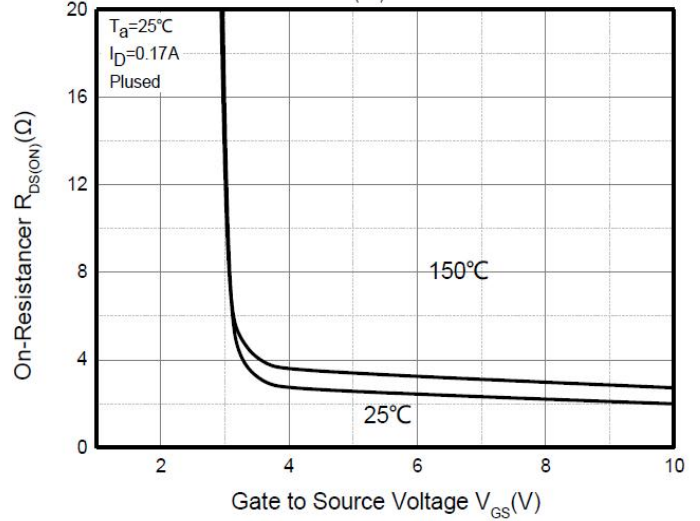
Transfer Characteristics



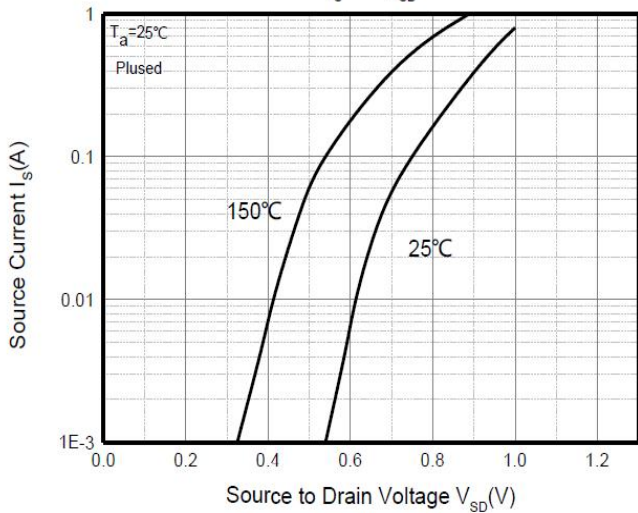
$R_{DS(ON)} - I_D$



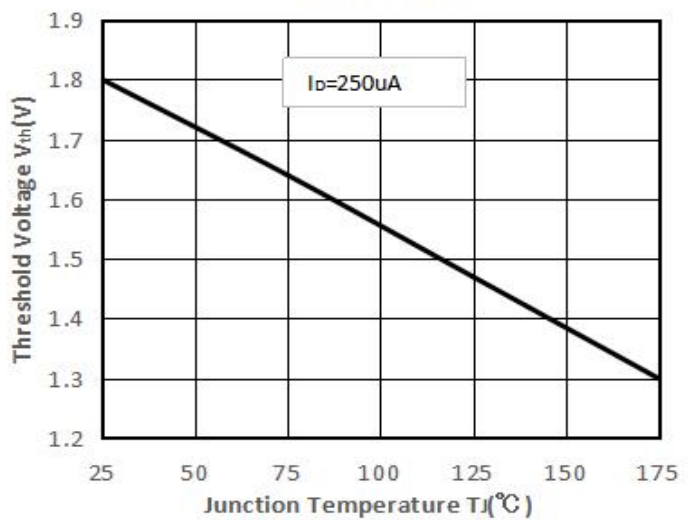
$R_{DS(ON)} - V_{GS}$



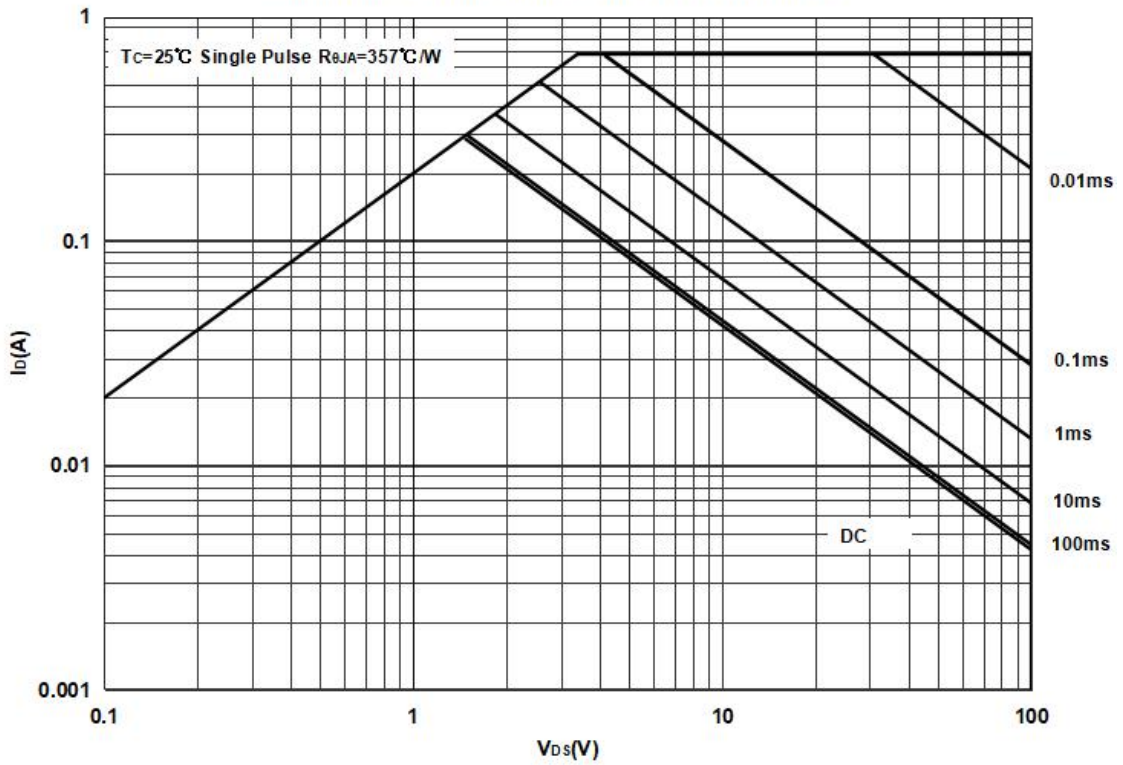
$I_s - V_{SD}$



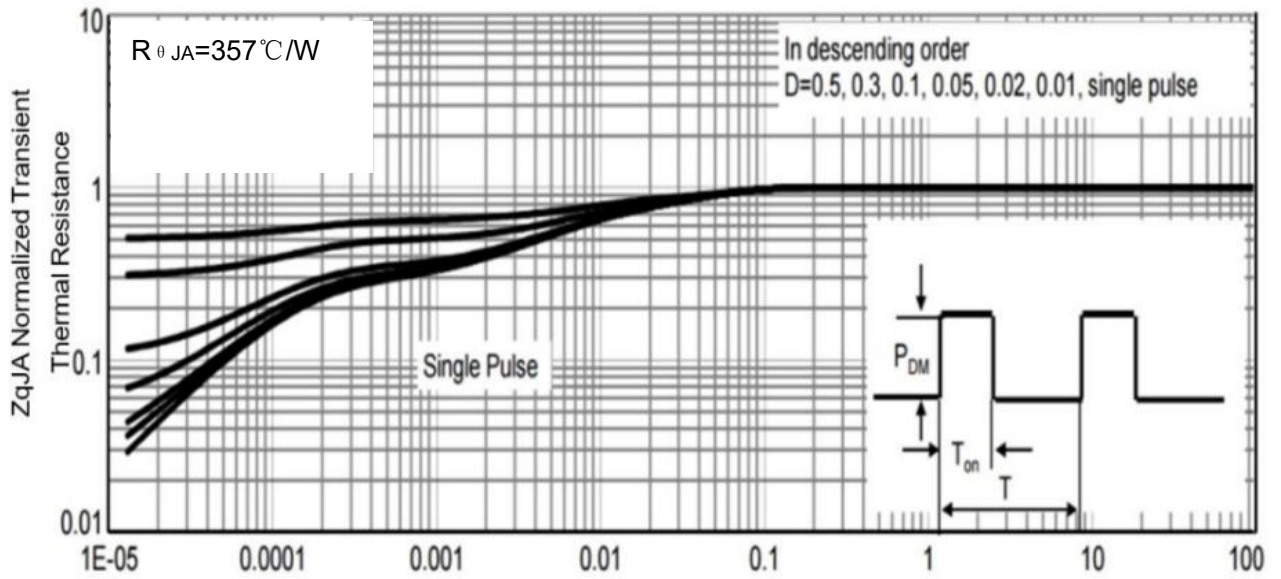
Threshold Voltage



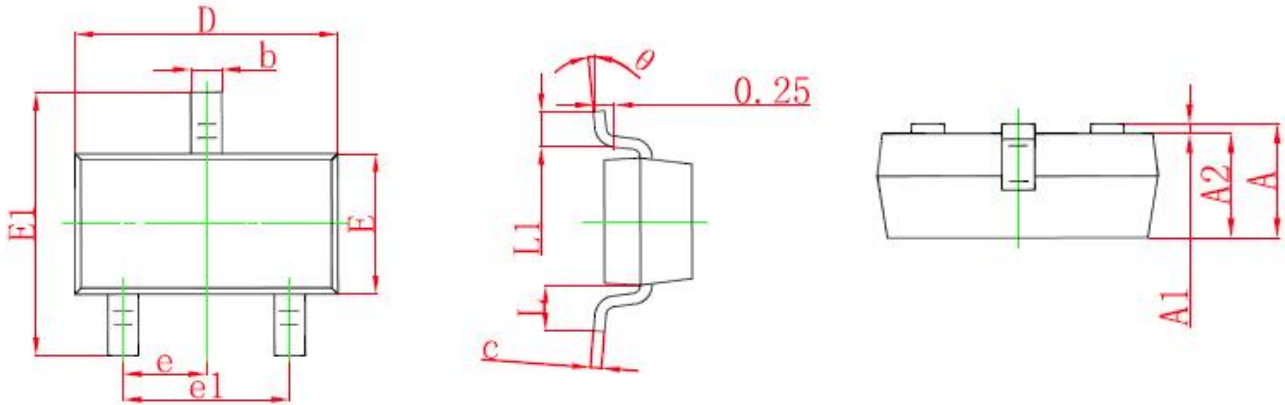
### Maximum Forward Biased Safe Operating Area



### Normalized Thermal Transient Impedance

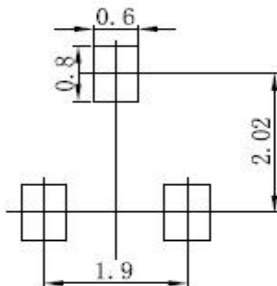


## SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

## SOT-23 Suggested Pad Layout



### Note:

1. Controlling dimension: in millimeters.
2. General tolerance:  $\pm 0.05\text{mm}$ .
3. The pad layout is for reference purposes only.

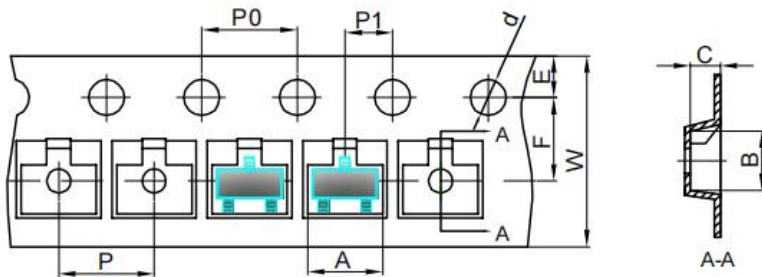
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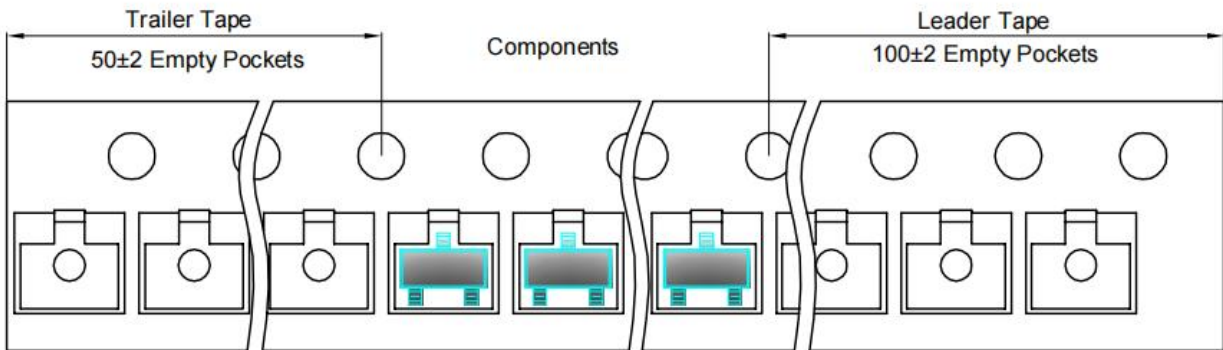
# SOT-23 Tape and reel

## SOT-23 Embossed Carrier Tape

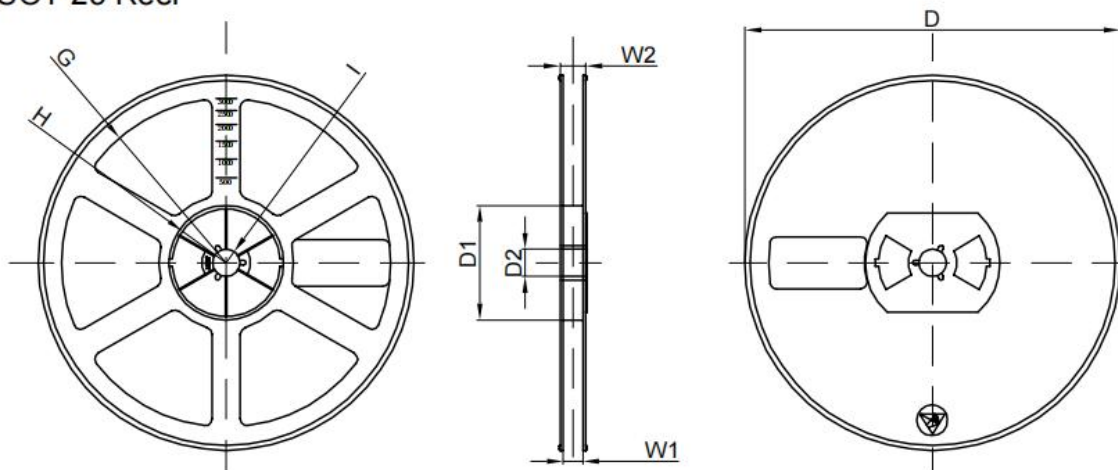


Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

## SOT-23 Tape Leader and Trailer



## SOT-23 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	30,000 pcs	203×203×195	120,000 pcs	438×438×220	

Date of change	Rev #	revise content
2023/2/24	A/0	/