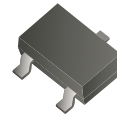


BSS123T-HF

N-Channel

RoHS Device

Halogen Free



Features

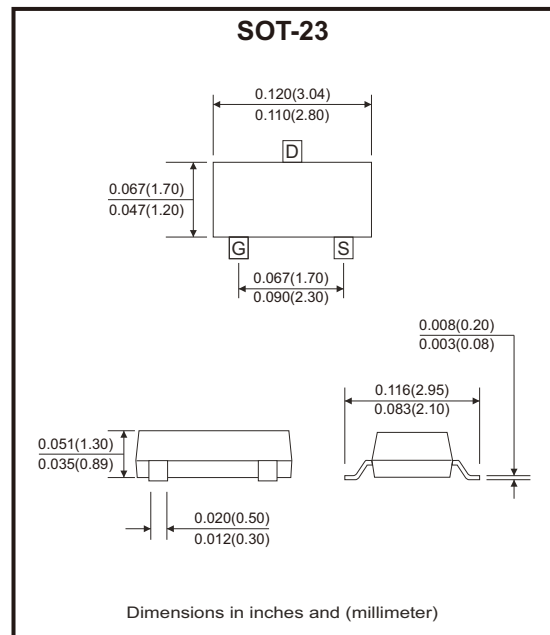
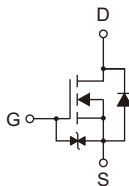
- ESD protected gate.
- High speed switching.
- Easily designed drive circuits.
- Low voltage drive.
- Easy to use in parallel.

Mechanical data

- Case: SOT-23, molded plastic.
- Terminal: Solderable per MIL-STD-750, method 2026.
- Mounting position: Any.

Circuit Diagram

- G : Gate
- S : Source
- D : Drain



Maximum Ratings (at $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain source voltage	V_{DS}	100	V
Gate source voltage	V_{GS}	± 20	
Continuous drain current @ $V_{GS}=10\text{V}$, $T_A=25^{\circ}\text{C}$	I_D	190	mA
Continuous drain current @ $V_{GS}=10\text{V}$, $T_A=70^{\circ}\text{C}$	I_D	152	
Pulsed drain current (Note 1)	I_{DM}	760	
Total power dissipation (Note 2)	P_D	300	mW
Operating junction temperature range	T_J	-55 to +150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction to ambient (Note 2)	$R_{\theta JA}$	416	$^{\circ}\text{C/W}$

Notes: 1. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

2. When the device is mounted on a glass epoxy board with area measuring 1 x 0.75 x 0.62 inch.

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static						
Drain source breakdown voltage (Note 1)	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	100			V
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1		2.5	
Gate body leakage current	I _{GSS}	V _{GS} = ±16V, V _{DS} = 0V			±10	μA
Zero gate voltage drain current	I _{DSS}	V _{DS} = 80V, V _{GS} = 0V			1	
		V _{DS} = 80V, V _{GS} = 0V, T _J = 55°C			5	
Static drain source on-resistance (Note 1)	R _{DS(on)}	I _D = 100mA, V _{GS} = 10V		2.8	5.6	Ω
		I _D = 100mA, V _{GS} = 4.5V		3.0	7.0	
Forward transconductance	g _{fs}	V _{DS} = 10V, I _D = 100mA	100			mS
Dynamic						
Input capacitance	C _{iss}	V _{DS} = 25V, V _{GS} = 0V, f = 1MHz		26	39	pF
Output capacitance	C _{oss}			11	16	
Reverse transfer capacitance	C _{rss}			3.1	4.6	
Turn-on delay time (Note 1)	t _{d(on)}	V _{DS} = 50V, I _D = 0.26A, V _{GS} = 10V, R _G = 6Ω		4.2	6.3	ns
Rise time (Note 1)	t _r			15.2	22.8	
Turn-off delay time (Note 1)	t _{d(off)}			10.2	15.3	
Fall time (Note 1)	t _f			18.8	28.2	
Total gate charge (Note 1)	Q _g	V _{DS} = 80V, I _D = 0.26A, V _{GS} = 10V		1.85	2.8	nC
Gate source charge (Note 1)	Q _{gs}			0.72	1.1	
Gate drain charge (Note 1)	Q _{gd}			0.17	0.26	
Body Diode						
Diode forward voltage (Note 1)	V _{SD}	I _S = 0.34A		0.9	1.3	V

Notes: 1. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Typical Rating and Characteristic Curves (BSS123T-HF)

Fig.1 - Typical Output Characteristics

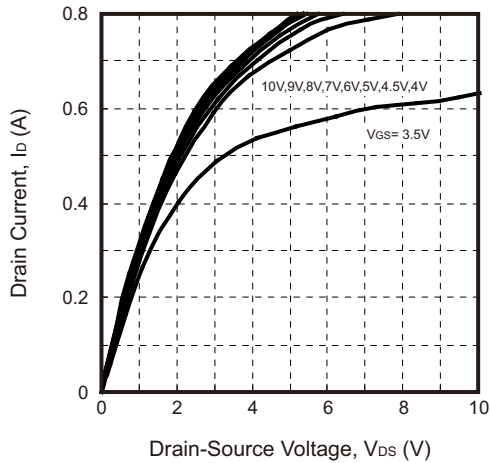


Fig.2 - Breakdown Voltage vs Junction Temperature

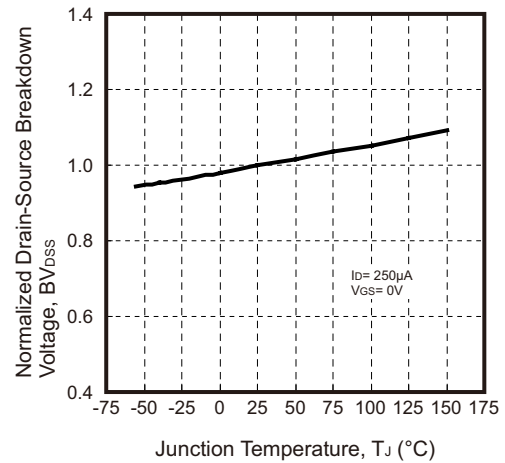


Fig.3 - Static Drain-Source On-State Resistance vs Drain Current

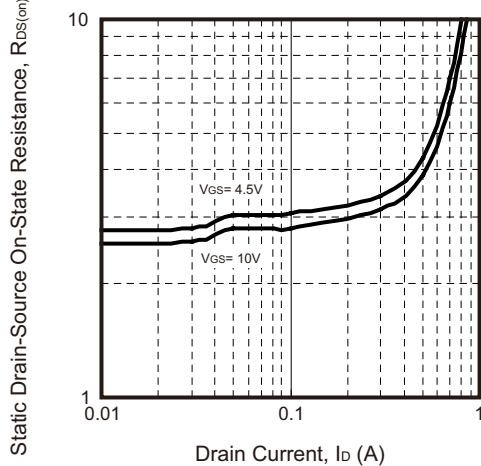


Fig.4 - Reverse Drain Current vs Source-Drain Voltage

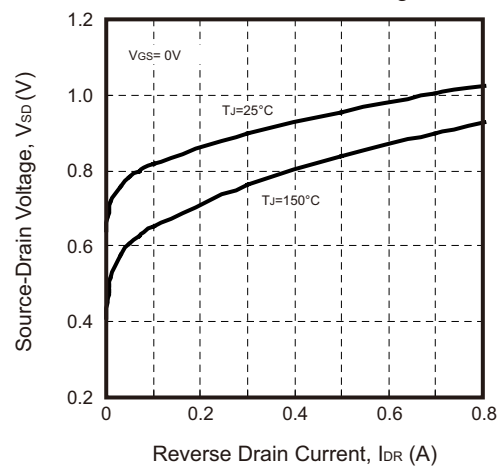


Fig.5 - Static Drain-Source On-State Resistance vs Gate-Source Voltage

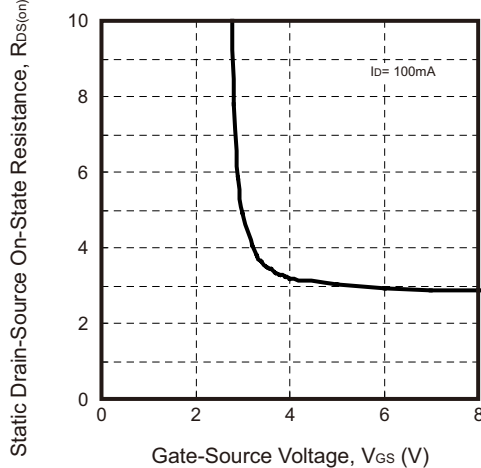
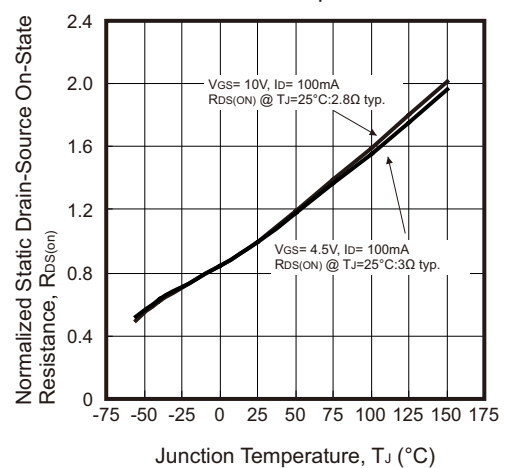


Fig.6 - Drain-Source On-State Resistance vs Junction Temperature



Typical Rating and Characteristic Curves (BSS123T-HF)

Fig.7 - Capacitance vs Drain-Source Voltage

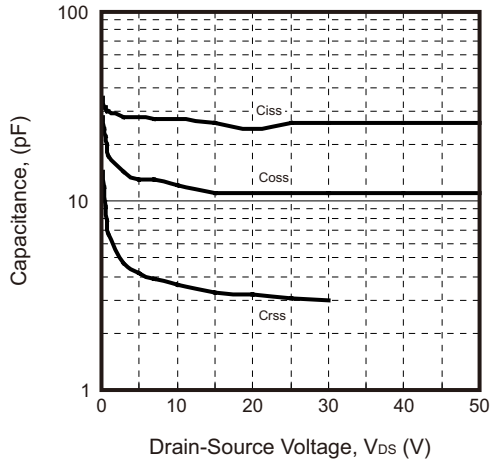


Fig.8 - Threshold Voltage vs Junction Temperature

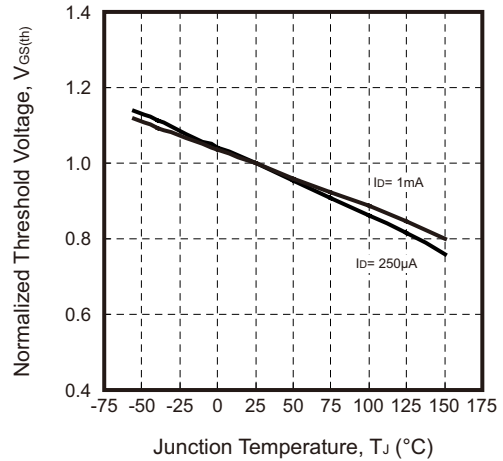


Fig.9 - Forward Transfer Admittance vs Drain Current

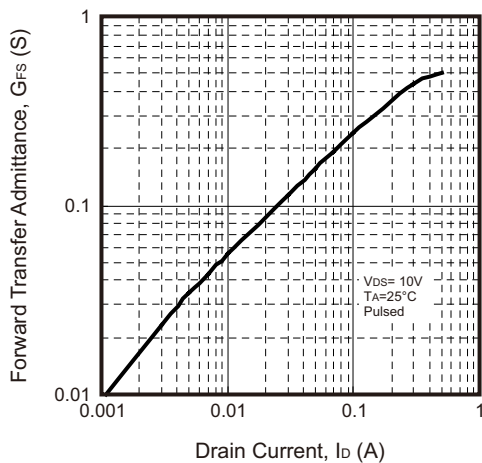


Fig.10 - Gate Charge Characteristics

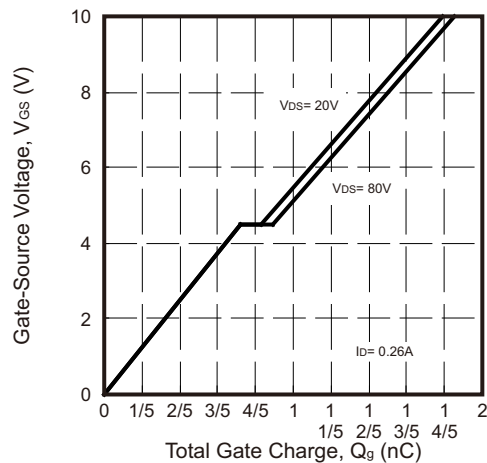


Fig.11 - Maximum Safe Operating Area

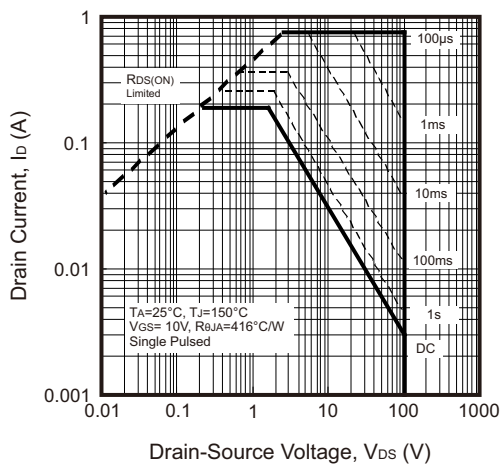
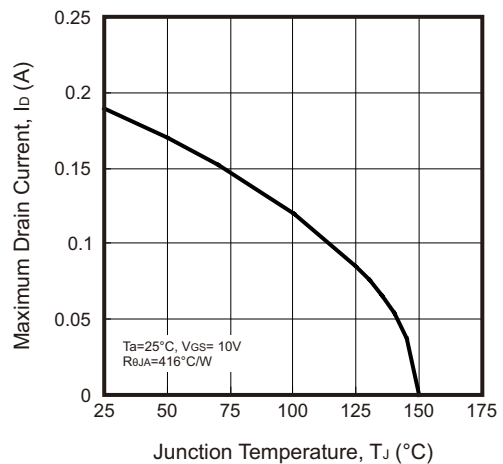


Fig.12 - Maximum Drain Current vs Junction Temperature



Typical Rating and Characteristic Curves (BSS123T-HF)

Fig.13 - Typical Transfer Characteristics

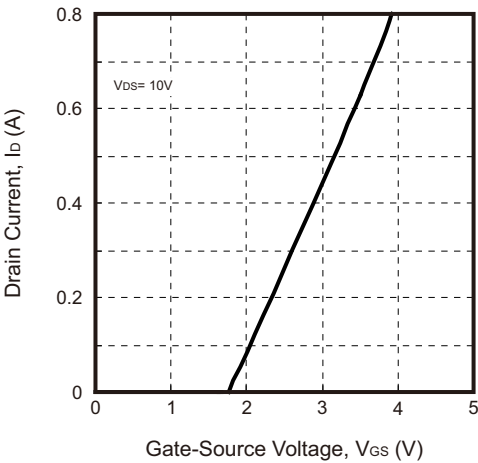


Fig.14 - Single Pulse Power Rating, Junction to Ambient (Note on page 2)

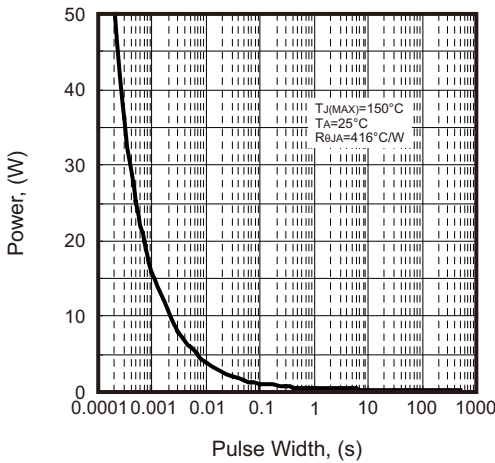
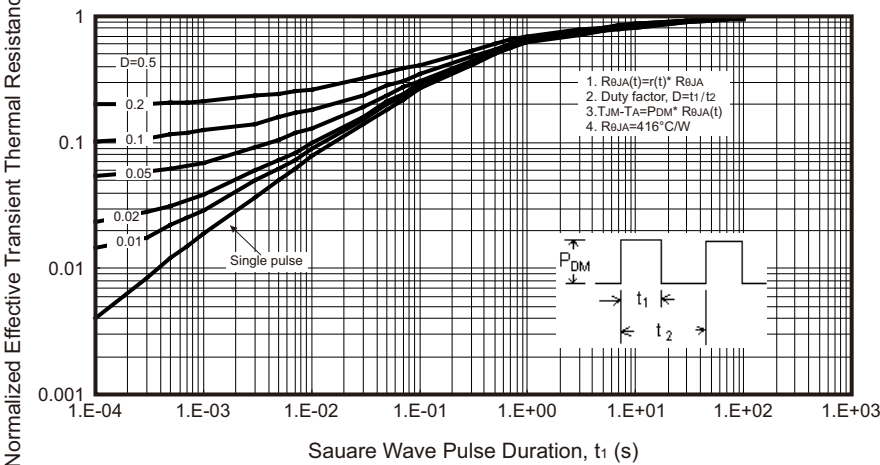
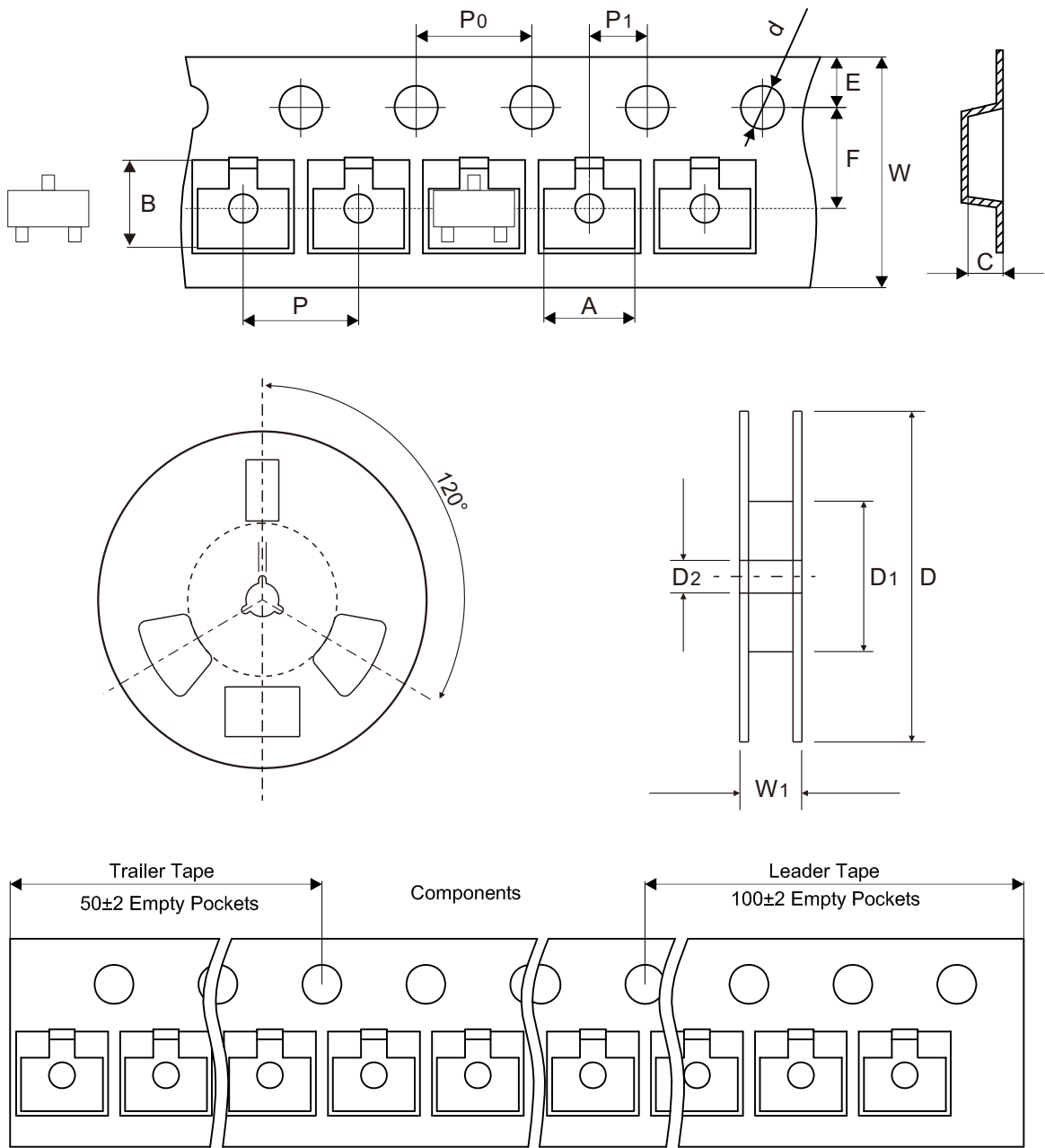


Fig.15 - Transient Thermal Response Curves



Reel Taping Specification



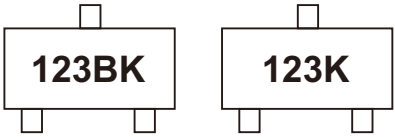
SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	See Note 1			1.50 + 0.10 - 0.00	179.00 Max	50.00 Min	13.00 ± 0.50
	(inch)				0.059 + 0.004 - 0.000	7.047 Max	1.969 Min	0.512 ± 0.020

SOT-23	SYMBOL	E	F	P	P0	P1	W	W1
	(mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	8.30 Max	14.40 Max
	(inch)	0.069 ± 0.004	0.138 ± 0.002	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	0.327 Max	0.567 Max

Notes: 1. A, B, and C are determined by component size.
The clearance between the components and the cavity must be within 0.05mm min. to 0.5mm max.

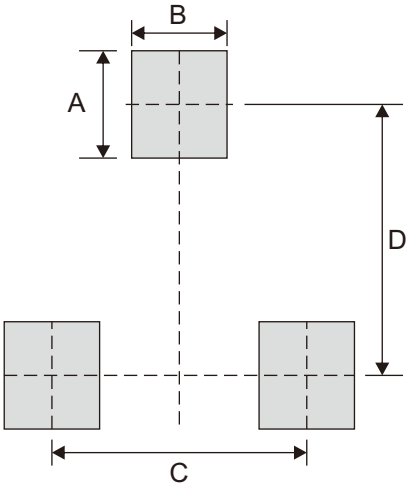
Marking Code

Part Number	Marking Code	
	123BK	123K
BSS123T-HF	123BK	123K



Suggested P.C.B. PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.90	0.035
B	0.80	0.031
C	1.90	0.075
D	2.02	0.080



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-23	3,000	7