



TM05P03I

P-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

General Features

$V_{DS} = -30V$ $I_D = -4.6A$

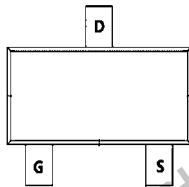
$R_{DS(ON)} = 36m\Omega$ (Typ.) @ $V_{GS} = -10V$

100% UIS Tested

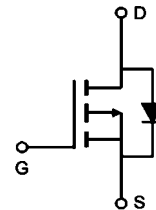
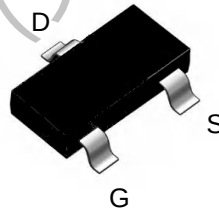
100% R_g Tested



I: SOT-23



Marking: A19T



Absolute Maximum Ratings $T_A = 25^\circ C$ un (less otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-4.6	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ -10V^1$	-3.0	A
I_{DM}	Pulsed Drain Current ²	-17	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation ³	1.4	W
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	162	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	---	$^\circ C/W$

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Electrical Characteristics (T_J=25°C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-30	-32	---	V
ΔBVDSS/ΔT _J	BV _{DSS} Temperature Coefficient	Reference to 25°C, I _D =-1mA	---	-0.014	---	V/°C
RDS(ON)	Static Drain-Source On-Resistance	V _{GS} =-10V, I _D =-3A	---	36	50	mΩ
		V _{GS} =-4.5V, I _D =-3A	---	49	65	
VGS(th)	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =-250uA	-0.5	-0.9	-1.1	V
ΔVGS(th)	VGS(th) Temperature Coefficient		---	2.6	---	mV/°C
IDSS	Drain-Source Leakage Current	V _{DS} =-24V, V _{GS} =0V, T _J =25°C	---	---	-1	uA
		V _{DS} =-24V, V _{GS} =0V, T _J =55°C	---	---	-5	
IGSS	Gate-Source Leakage Current	V _{GS} =±12V, V _{DS} =0V	---	---	±100	nA
gfs	Forward Transconductance	V _{DS} =-5V, I _D =-3A	---	5.6	---	S
Q _g	Total Gate Charge (-4.5V)	V _{DS} =-15V, V _{GS} =-4.5V, I _D =-3A	---	11.9	---	nC
Q _{gs}	Gate-Source Charge		---	1.8	---	
Q _{gd}	Gate-Drain Charge		---	3	---	
Td(on)	Turn-On Delay Time	V _{DD} =-15V, V _{GS} =-4.5V, R _G =3.3Ω, I _D =-3A	---	6.6	---	ns
T _r	Rise Time		---	27.8	---	
Td(off)	Turn-Off Delay Time		---	46.2	---	
T _f	Fall Time		---	20.6	---	
Ciss	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	390	---	pF
Coss	Output Capacitance		---	73	---	
Crss	Reverse Transfer Capacitance		---	71	---	
IS	Continuous Source Current ^{1,4}	V _G =V _D =0V, Force Current	---	---	-4.6	A
VSD	Diode Forward Voltage ²	V _{GS} =0V, I _S =-1A, T _J =25°C	---	---	-1.2	V

Note :

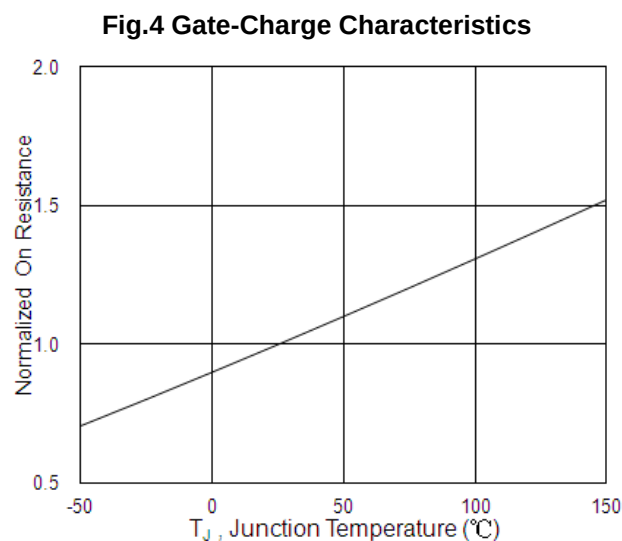
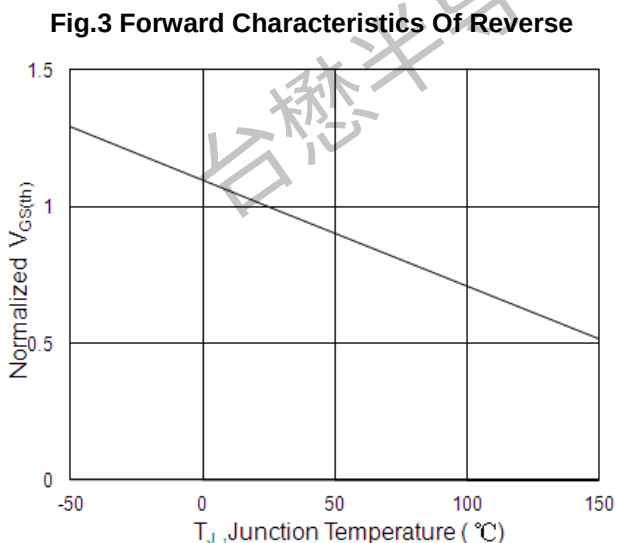
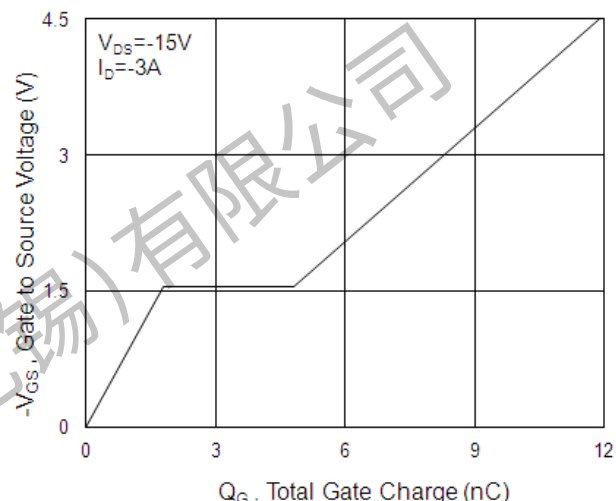
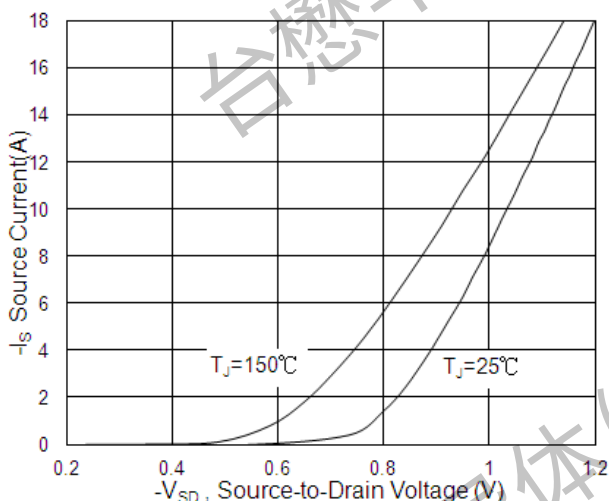
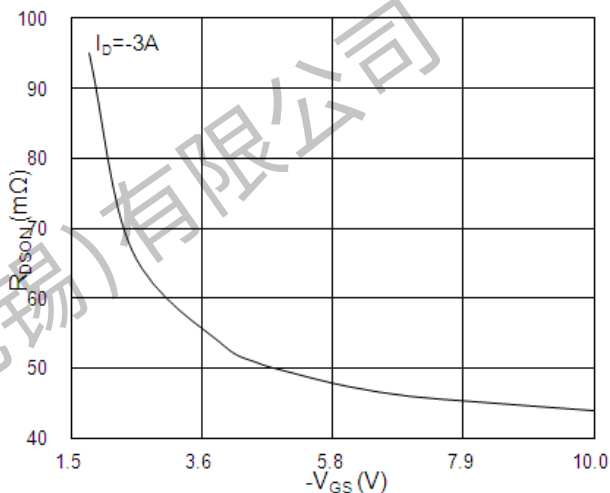
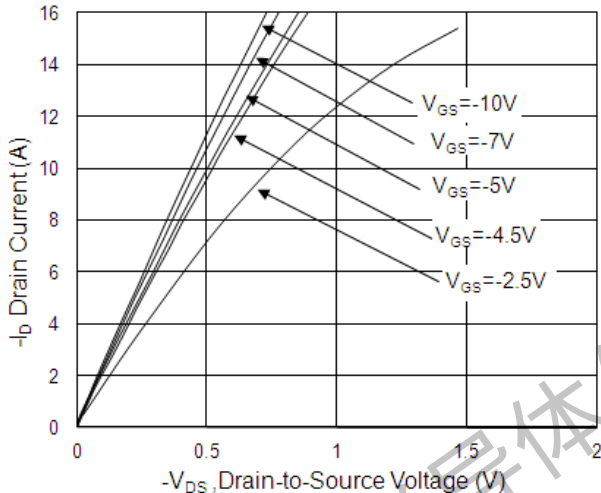
- 1.The data tested by surface mounted on a 1 inch 2 FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3.The power dissipation is limited by 150°C junction temperature
- 4.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.



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Typical Characteristics





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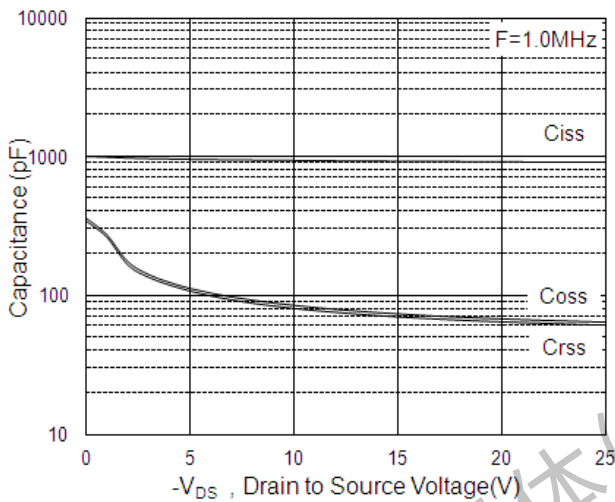


Fig.7 Capacitance

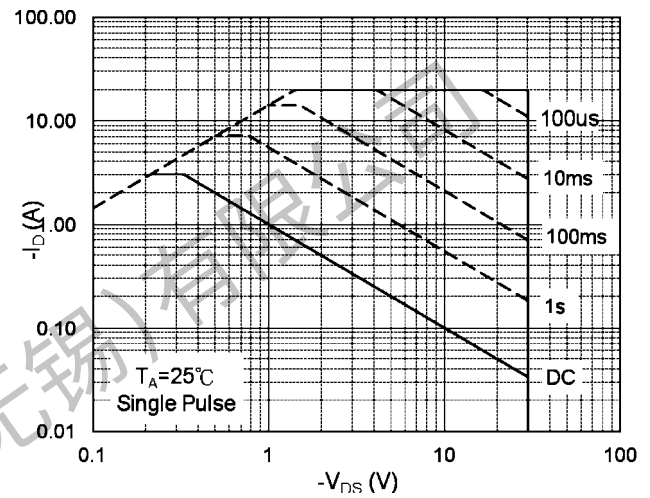


Fig.8 Safe Operating Area

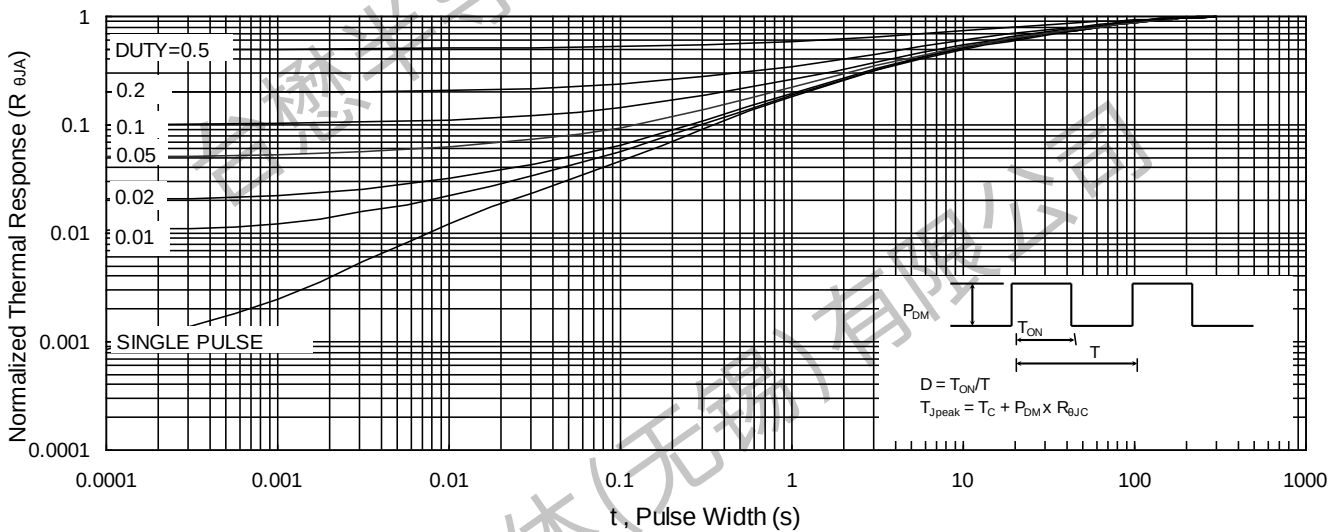


Fig.9 Normalized Maximum Transient Thermal Impedance

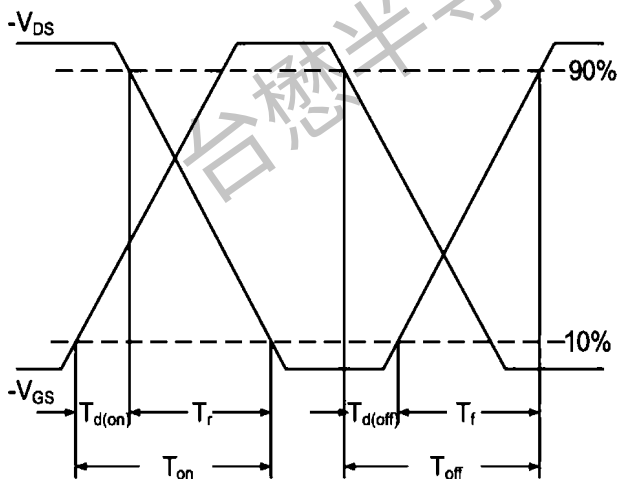


Fig.10 Switching Time Waveform

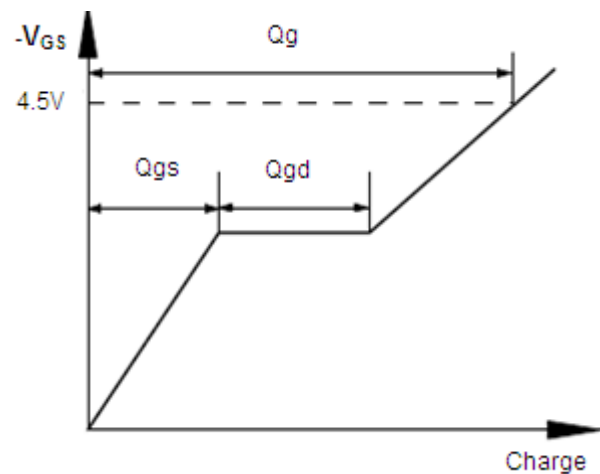


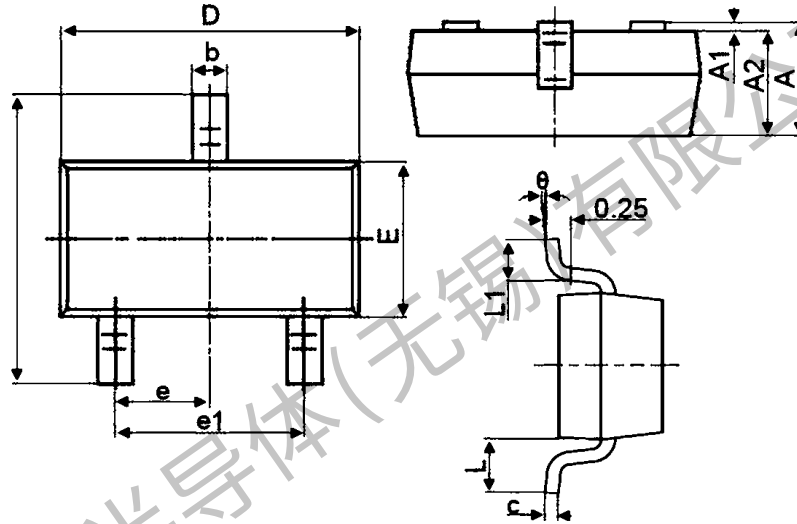
Fig.11 Gate Charge Waveform



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Package Mechanical Data:SOT-23



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

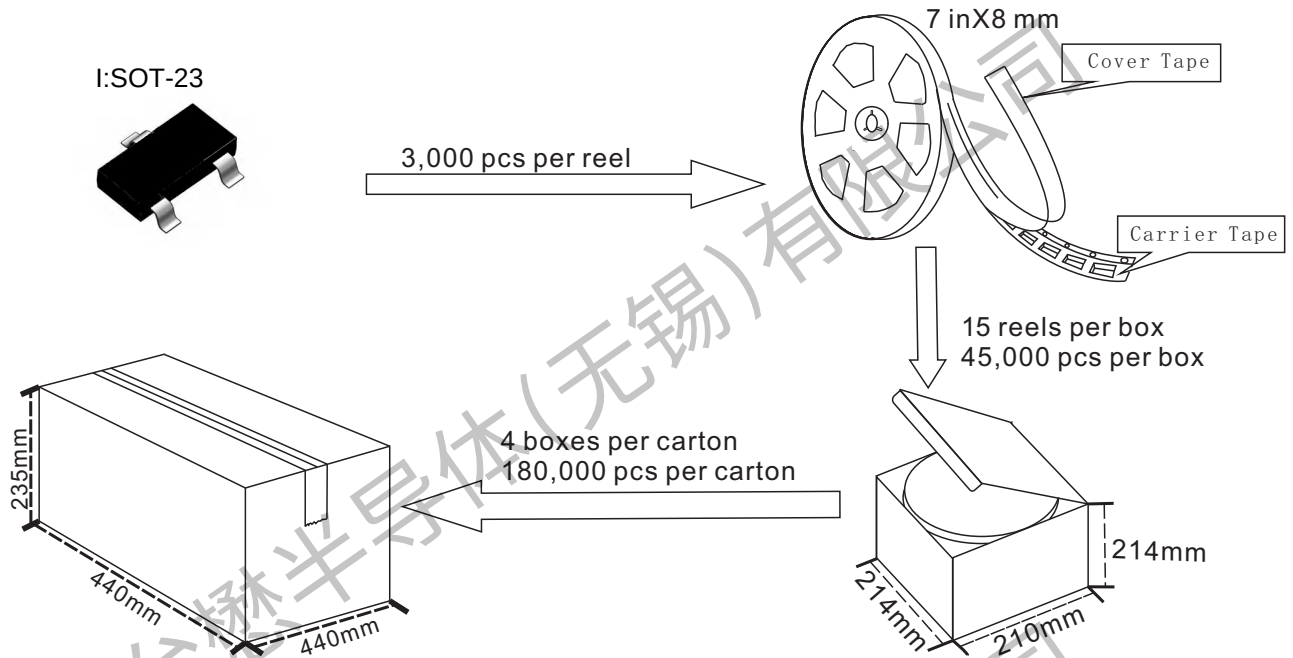


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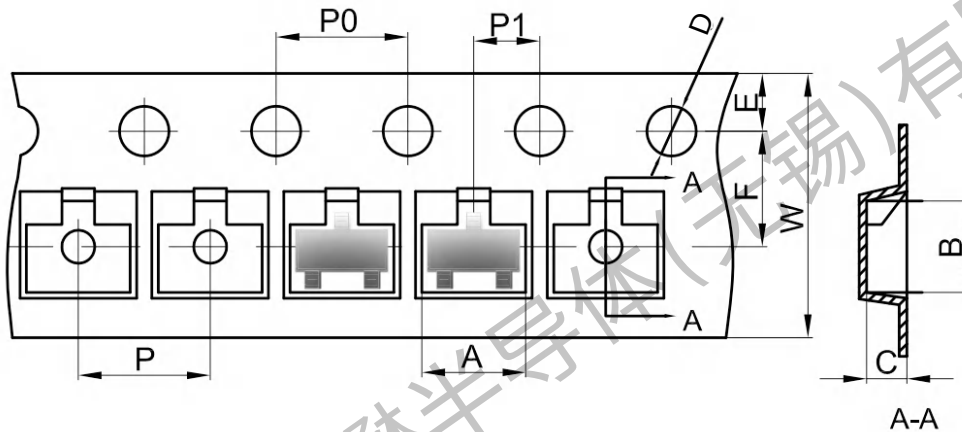
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SOT-23 Packing

1. The method of packaging and dimension are shown as below figure. (Dimension in mm)



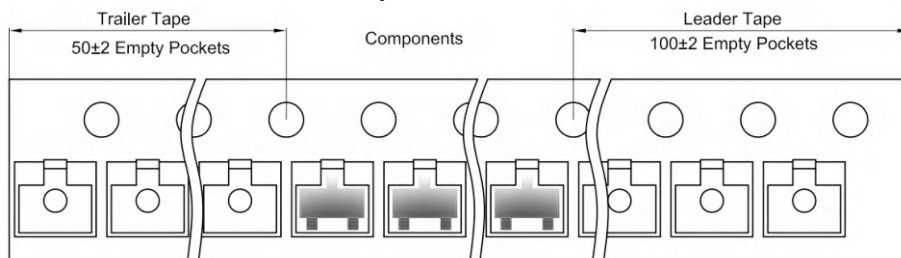
SOT-23 Embossed Carrier Tape



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



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Revision history:

Date	Rev	Description	Page
2024.06.09	24.06	Original	