



TM01P10I

P-Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

General Features

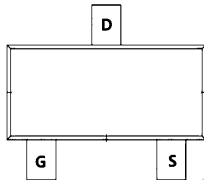
$V_{DS} = -100V$ $I_D = -0.9A$

$R_{DS(ON)} = 520m\Omega$ (typ.) @ $V_{GS} = -10V$

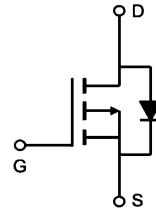
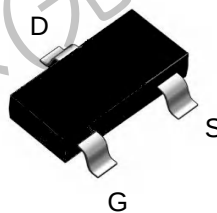
100% UIS Tested
100% R_g Tested



I: SOT-23



Marking: 1P10 OR MS01P



Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_A = 25^\circ C$	Continuous Drain Current, $V_{GS} @ -10V$	-0.9	A
$I_D @ T_A = 70^\circ C$	Continuous Drain Current, $V_{GS} @ -10V$	-0.7	A
I_{DM}	Pulsed Drain Current	-2.8	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation	1	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	---	162	$^\circ C/W$
R	Thermal Resistance Junction Case			$^\circ C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BVDSS	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=-250\mu A$	-100	---	---	V
$\Delta BVDSS/\Delta T_J$	BVDSS Temperature Coefficient	Reference to 25°C , $I_D=-1mA$	---	-0.0624	---	V/ $^{\circ}\text{C}$
RDS(ON)	Static Drain-Source On-Resistance ²	$V_{GS}=-10V$, $I_D=-0.8A$	---	520	650	m Ω
VGS(th)	Gate Threshold Voltage		-1.0	-2.0	-3.0	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient	$V_{GS}=V_{DS}$, $I_D=-250\mu A$	---	4.5	---	mV/ $^{\circ}\text{C}$
IDSS	Drain-Source Leakage Current	$V_{DS}=-80V$, $V_{GS}=0V$, $T_J=25^{\circ}\text{C}$	---	---	10	μA
		$V_{DS}=-80V$, $V_{GS}=0V$, $T_J=55^{\circ}\text{C}$	---	---	100	
IGSS	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
gfs	Forward Transconductance	$V_{DS}=-5V$, $I_D=-0.8A$	---	3	---	S
Rg	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1MHz$	---	16	32	Ω
Qg	Total Gate Charge (-4.5V)		---	4.5	---	nC
Qgs	Gate-Source Charge	$V_{DS}=-15V$, $V_{GS}=-4.5V$, $I_D=-0.5A$	---	1.14	---	
Qgd	Gate-Drain Charge		---	1.5	---	
Td(on)	Turn-On Delay Time		---	13.6	---	ns
Tr	Rise Time	$V_{DD}=-50V$, $V_{GS}=-10V$, $R_G=3.3\Omega$	---	6.8	---	
Td(off)	Turn-Off Delay Time	$I_D=-0.5A$	---	34	---	
Tf	Fall Time		---	3	---	
Ciss	Input Capacitance		---	553	---	pF
Coss	Output Capacitance	$V_{DS}=-15V$, $V_{GS}=0V$, $f=1MHz$	---	29	---	
Crss	Reverse Transfer Capacitance		---	20	---	
IS	Continuous Source Current ^{1,4}	$V_G=V_D=0V$, Force Current	---	---	-0.9	A
ISM	Pulsed Source Current ^{2,4}		---	---	-1.8	A
VSD	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=-1A$, $T_J=25^{\circ}\text{C}$	---	---	-1.2	V

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Typical Characteristics

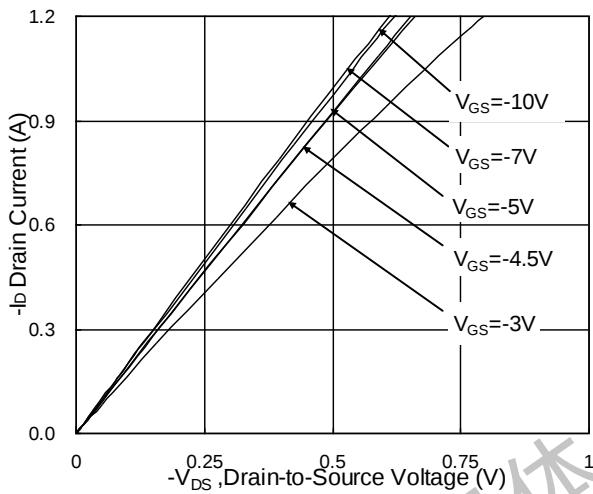


Fig.1 Typical Output Characteristics

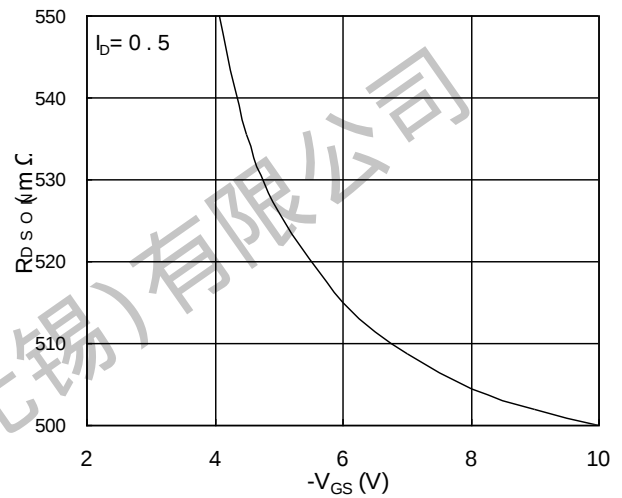


Fig.2 On-Resistance vs. Gate-Source

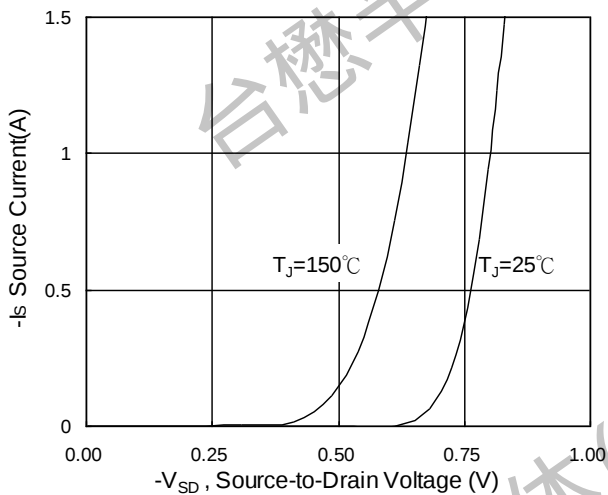


Fig.3 Forward Characteristics Of Reverse

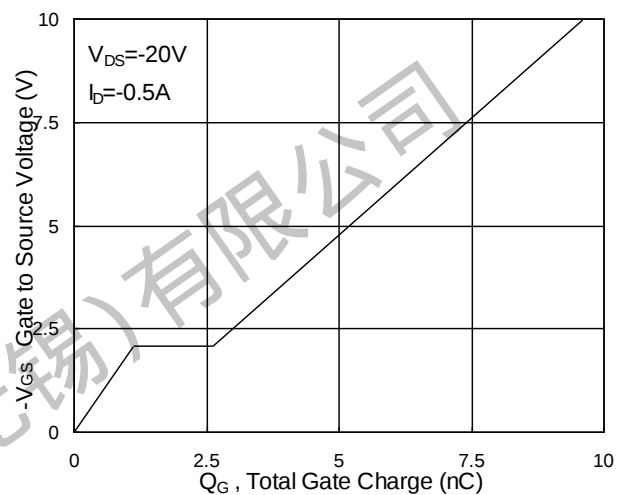


Fig.4 Gate-Charge Characteristics

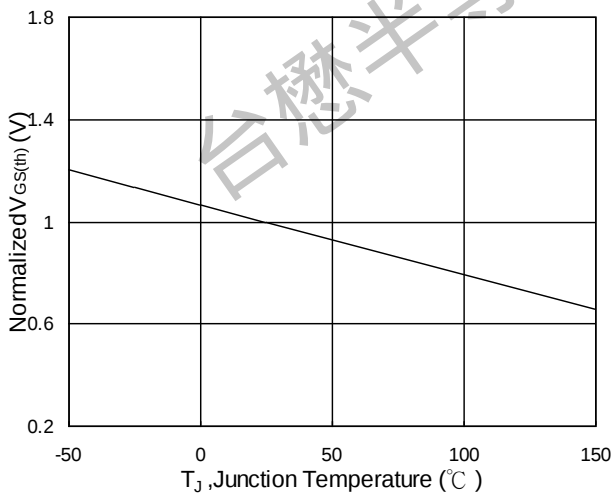


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

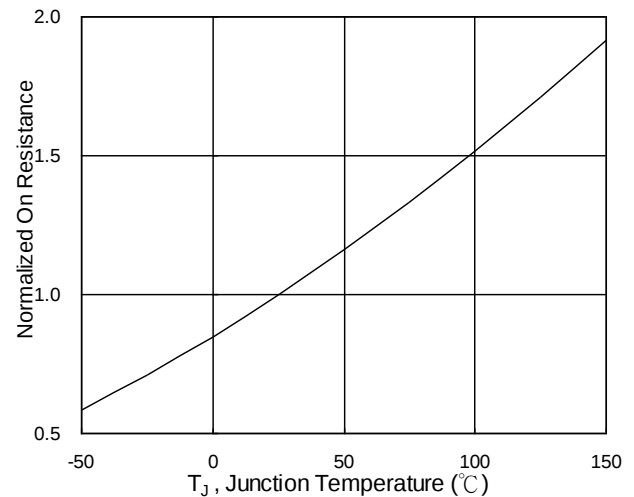


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

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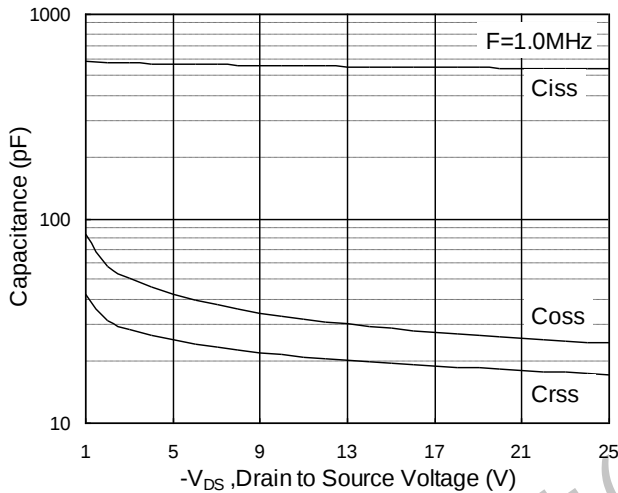


Fig.7 Capacitance

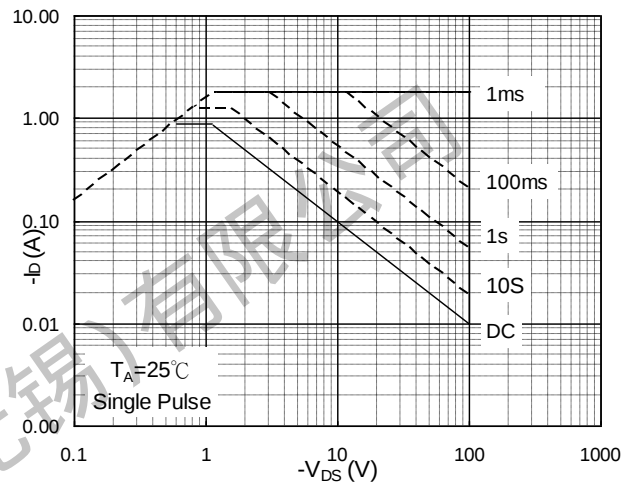


Fig.8 Safe Operating Area

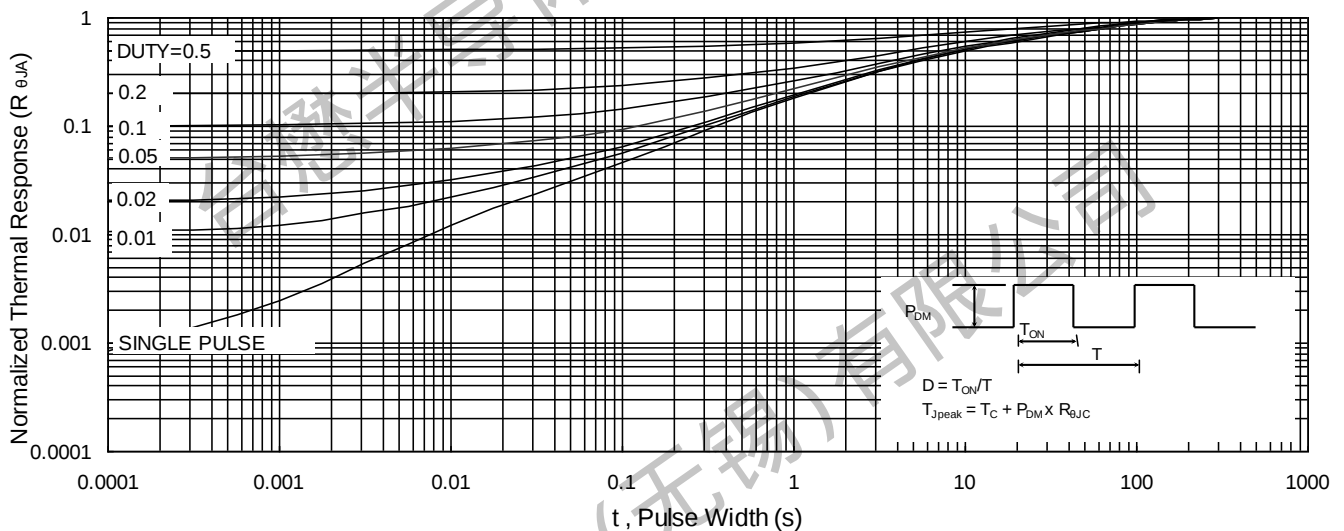


Fig.9 Normalized Maximum Transient Thermal Impedance

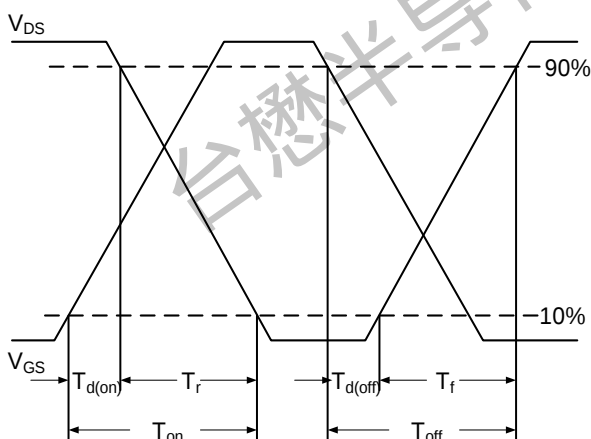


Fig.10 Switching Time Waveform

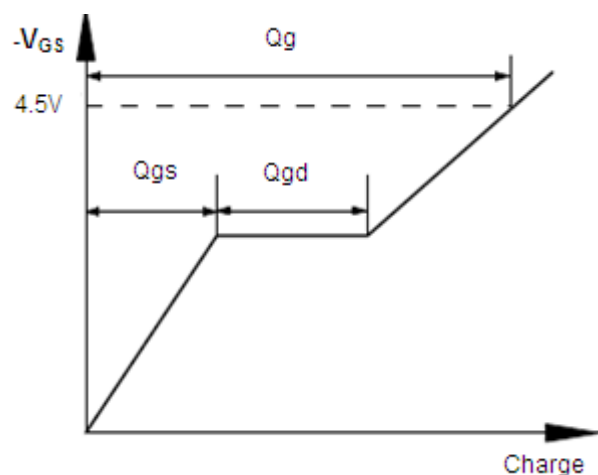
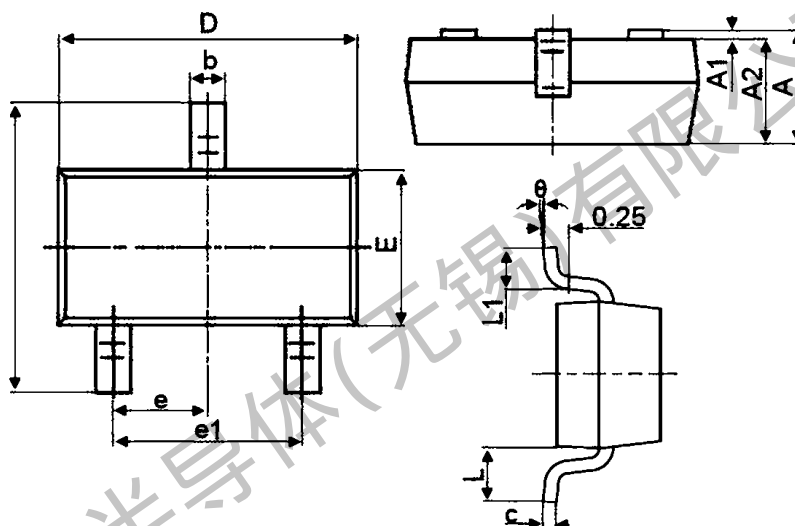


Fig.11 Gate Charge Waveform

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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°

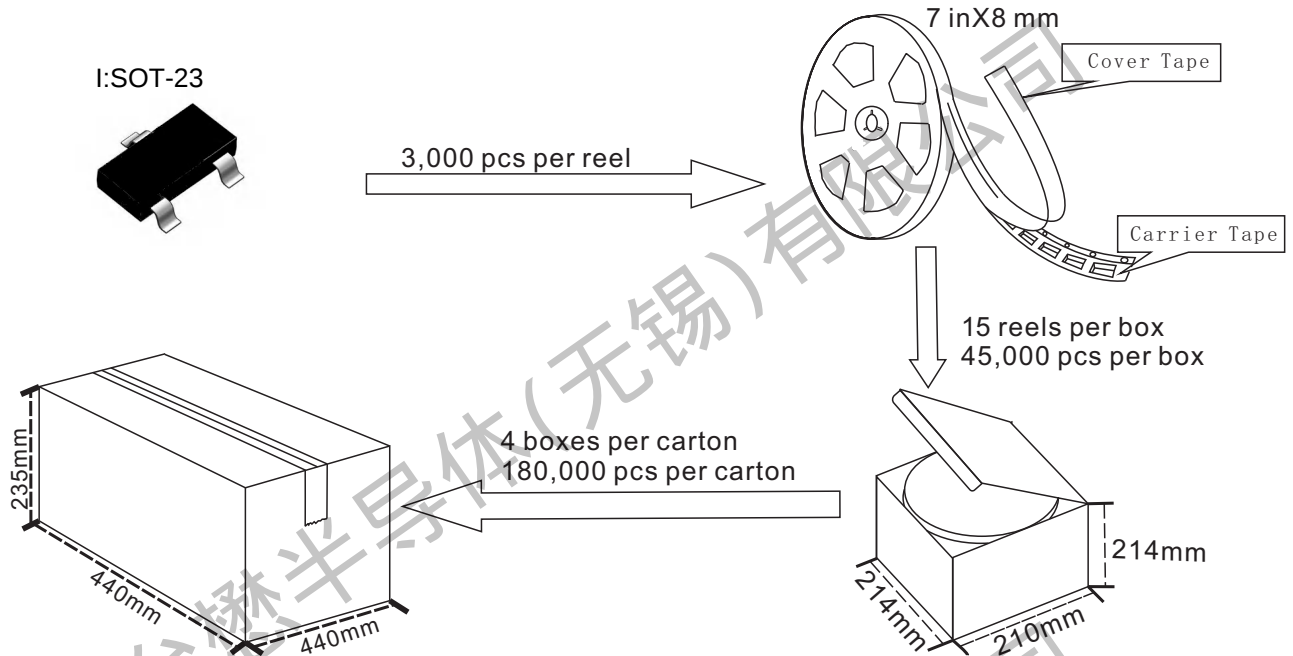


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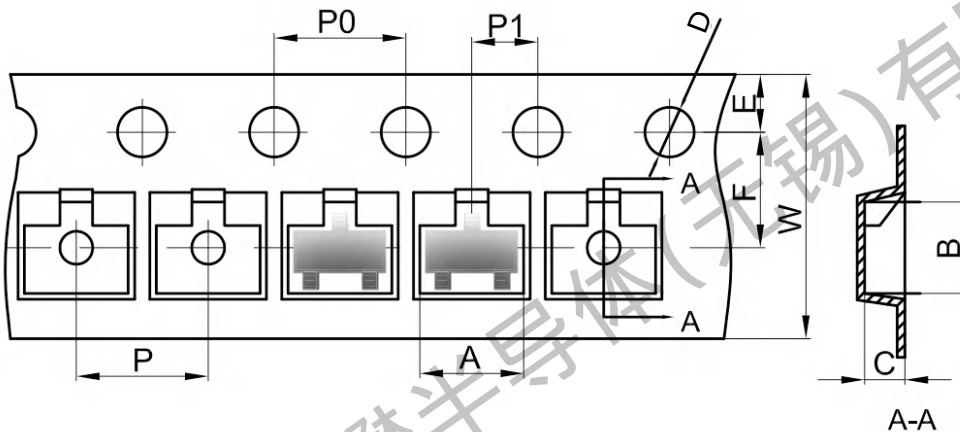
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SOT-23 Packing

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



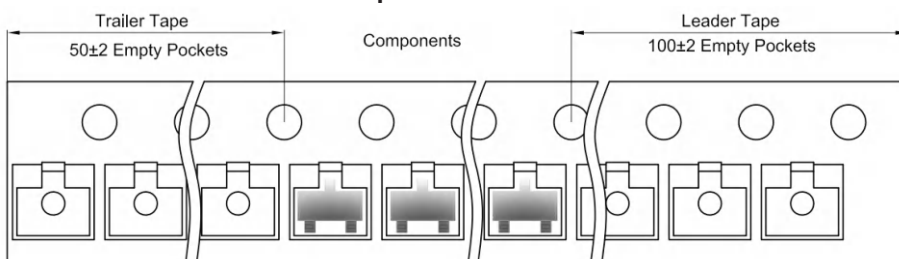
SOT-23 Embossed Carrier Tape



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
2023.04.28	23.04	Original	