

PRIMARY CHARACTERISTICS

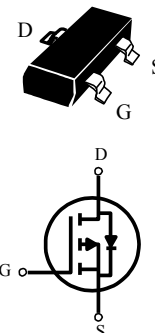
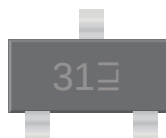
V_{DS}	$R_{DS(on)}$ m Ω Max	I_D
-30V	58@ $V_{GS}=-10V$	-4.3A
	72@ $V_{GS}=-4.5V$	
	86@ $V_{GS}=-2.5V$	

FEATURES

- Super high dense cell trench design for low $R_{DS(on)}$.
- Rugged and reliable

SOT-23
PACKAGE

Marking : 31


MECHANICAL DATA

- Case : Molded plastic, SOT-23
- Polarity : Shown above
- Terminals : Plated terminals, solderable per MIL-STD-750, Method 2026
- Epoxy : UL94-V0 rated flame retardant

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous ^a @ $T_A = 25^\circ\text{C}$ -Pulse ^b	I_D	-4.3	A
	I_{DM}	-16	A
Drain-Source Diode Forward Current ^a	I_S	-2.2	A
Maximum Power Dissipation ^a	P_D	1.25	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	- 55 to 150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Parameter	Symbol	Typ ^c	Max	Unit
Thermal Resistance, Junction-to-Ambient ^a	R_{thJA}	75	100	$^\circ\text{C/W}$

Note :

 a. Surface Mounted on FR4 Board , $t \leq 5\text{sec}$.

 b. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.

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

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V , I _D = -250uA	- 30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -20V , V _{GS} = 0V			-1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} = -12V , V _{DS} = 0V			-100	nA
ON CHARACTERISTICS ^b						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250uA	-0.7	-1.0	-1.3	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} = -10V , I _D = -4.2A		46	58	mΩ
		V _{GS} = -4.5V , I _D = -4.0A		55	72	mΩ
		V _{GS} = -2.5V , I _D = -1.0A		65	86	mΩ
DRAIN-SOURCE DIODE CHARACTERISTICS ^b						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V , I _S = -1.0A			-1.0	V
DYNAMIC CHARACTERISTICS ^c						
Input Capacitance	C _{ISS}	V _{DS} = 15V , V _{GS} = 0V f = 1.0MHz		1078		pF
Output Capacitance	C _{OSS}			155		pF
Reverse Transfer Capacitance	C _{RSS}			126		pF
SWITCHING CHARACTERISTICS ^c						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = -15V , I _D = -1A V _{GEN} = -4.5V R _L = 15 Ω R _{GEN} = 10 Ω		5		ns
Rise Time	t _r			3		ns
Turn-Off Delay Time	t _{D(OFF)}			30		ns
Fall Time	t _f			10		ns
Total Gate Charge	Q _g	V _{DS} = -15V I _D = -1A V _{GS} = -10V		25.2		nC
Gate-Source Charge	Q _{gs}			3.1		nC
Gate-Drain Charge	Q _{gd}			2.3		nC

Note :

b. Pulse Test : Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

c. Guaranteed by design, not subject to production testing.

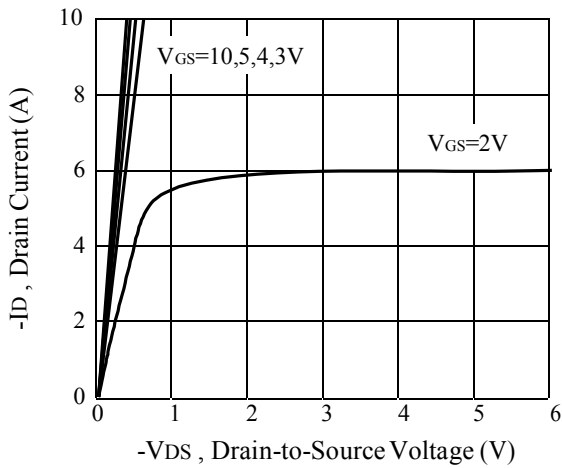


Figure 1. Output Characteristics

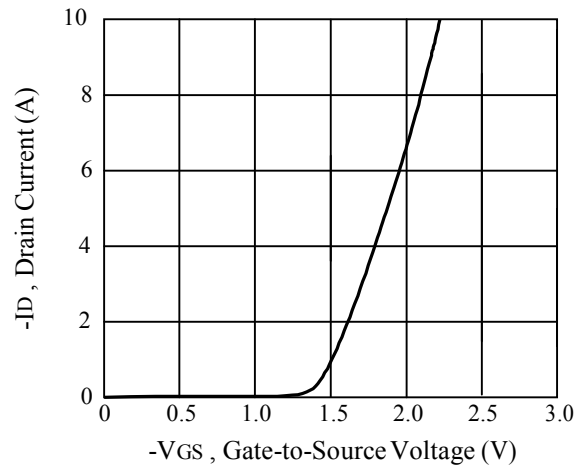


Figure 2. Transfer Characteristics

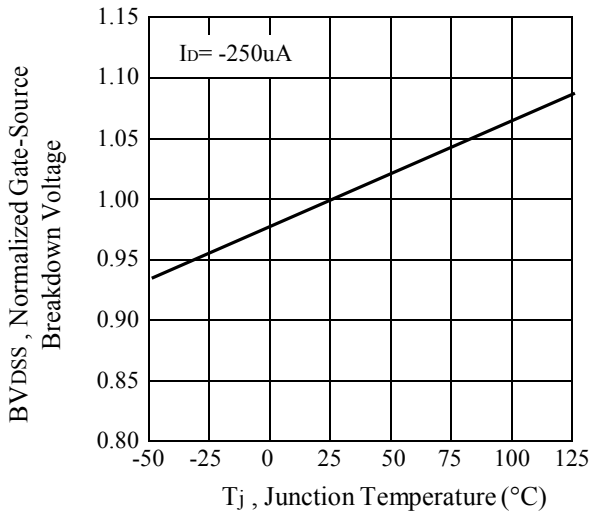


Figure 6. Breakdown Voltage Variation with Temperature

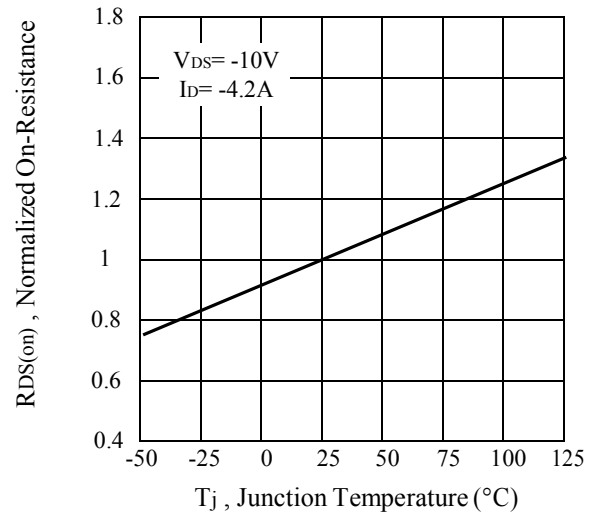


Figure 4. On-Resistance Variation with Temperature

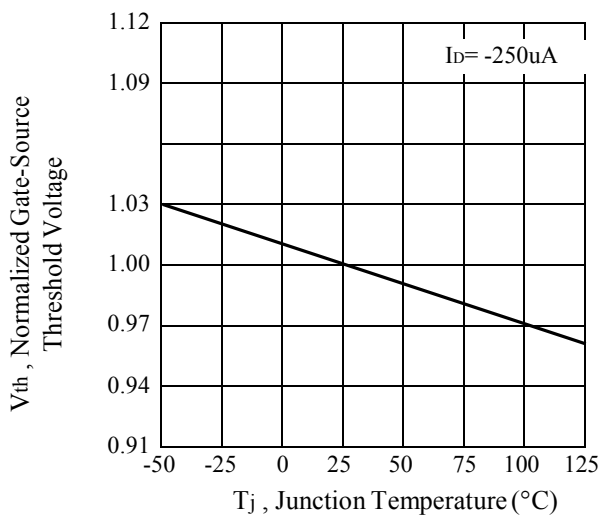


Figure 5. Gate Threshold Variation with Temperature

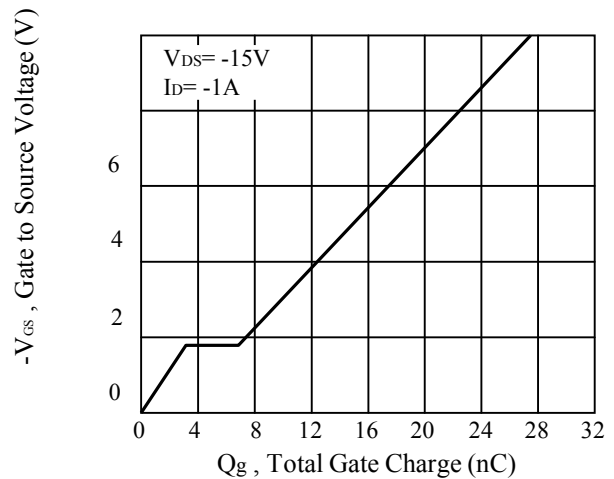


Figure 7. Gate Charge

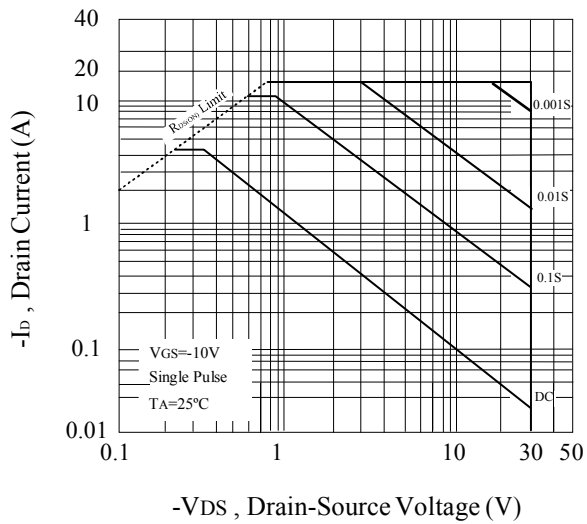


Figure 9. Maximum Safe Operating Area

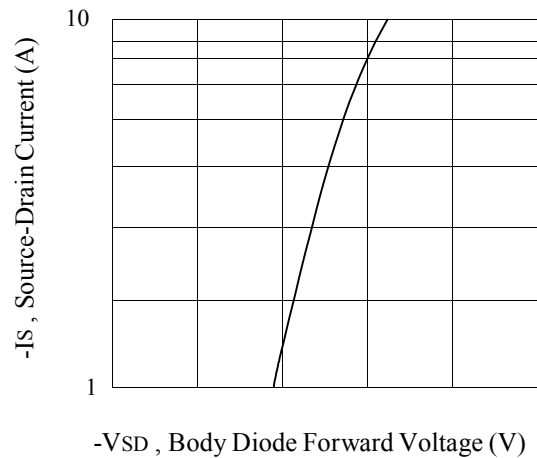


Figure 8. Body Diode Forward Voltage Variation with Source Current

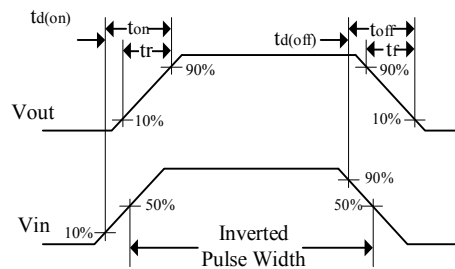
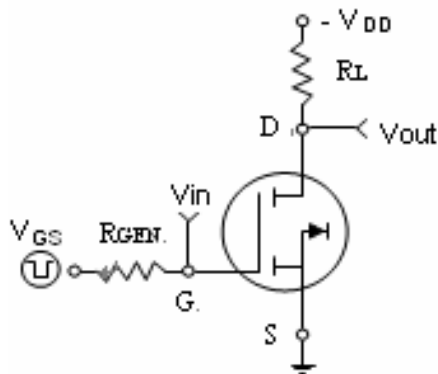


Figure 10. Switching Test Circuit and Switching Waveforms

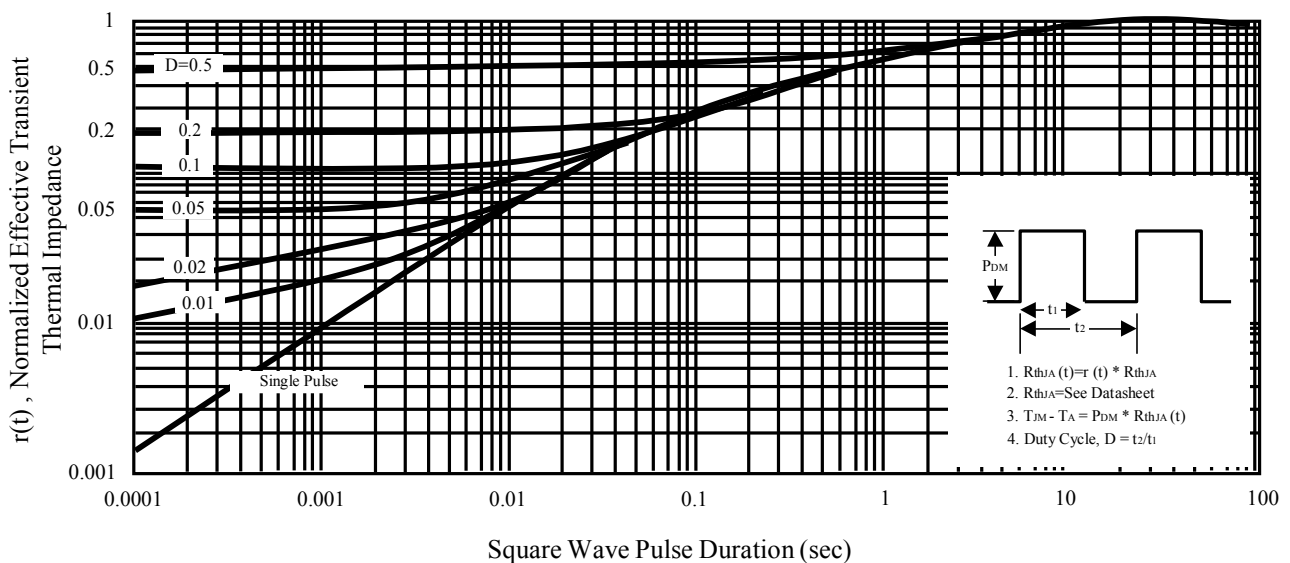
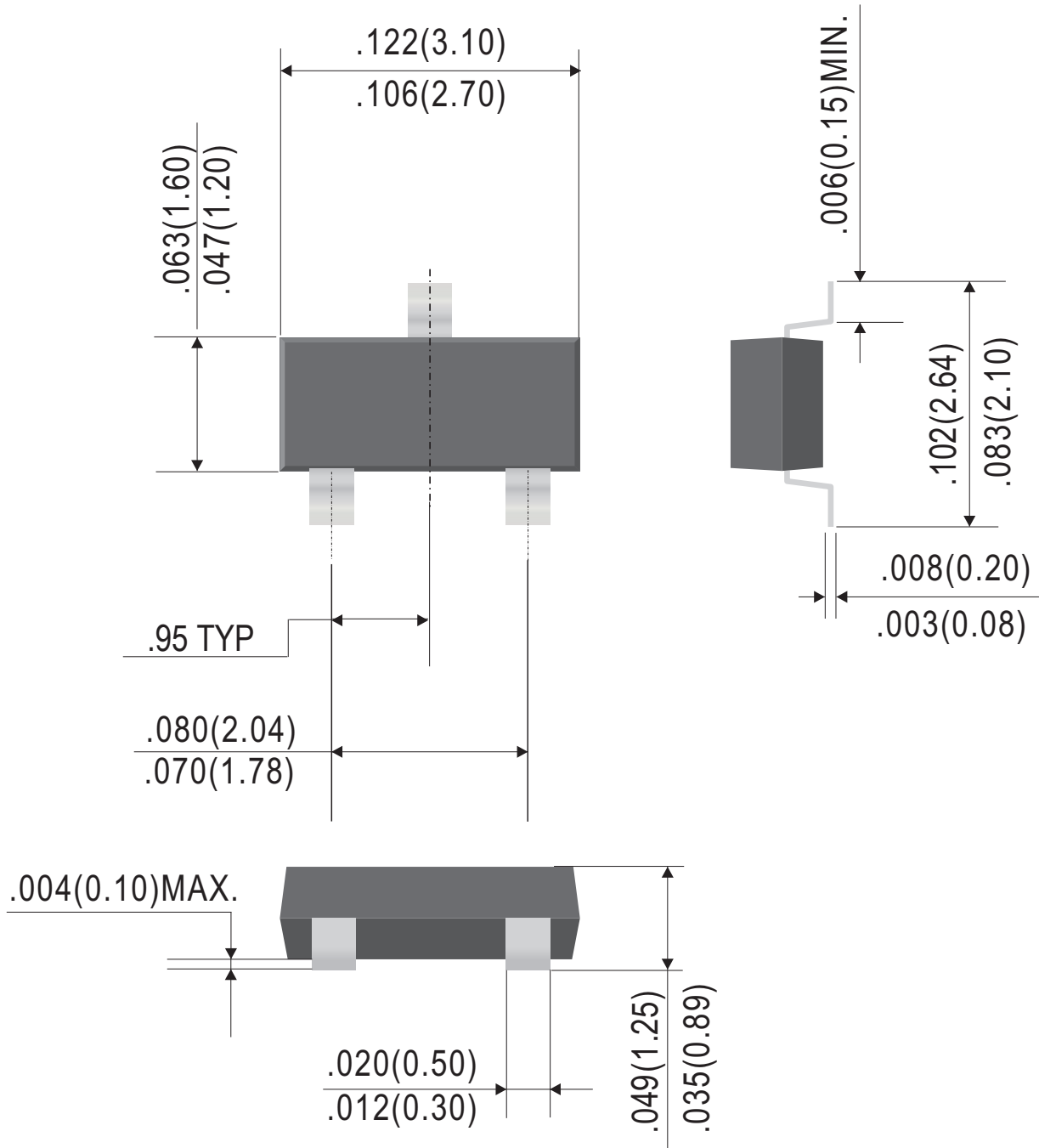


Figure 11. Normalized Thermal Transient Impedance Curve



Outline Drawing

SOT-23



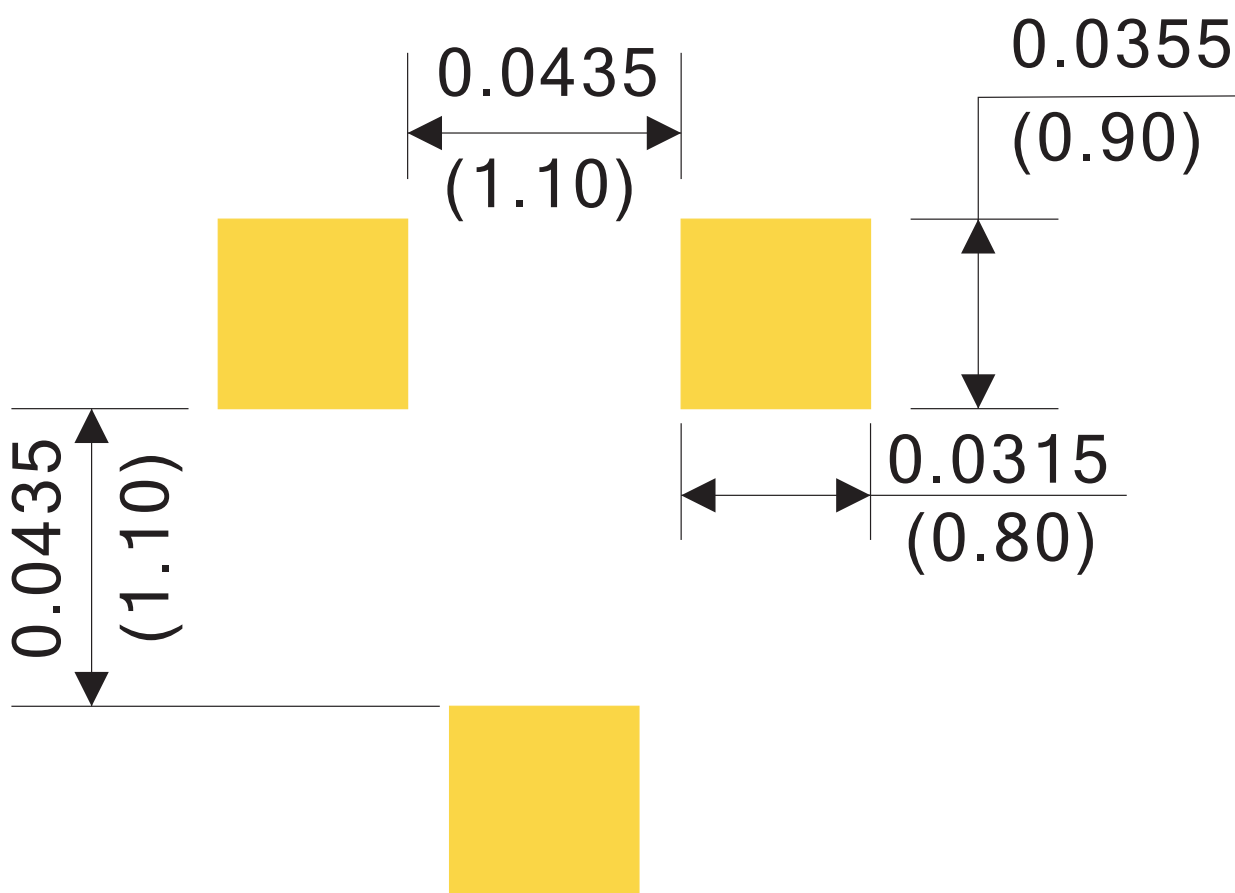
Dimensions in inches and (millimeters)

Rev.E



Suggested Soldering Pad Layout

SOT-23



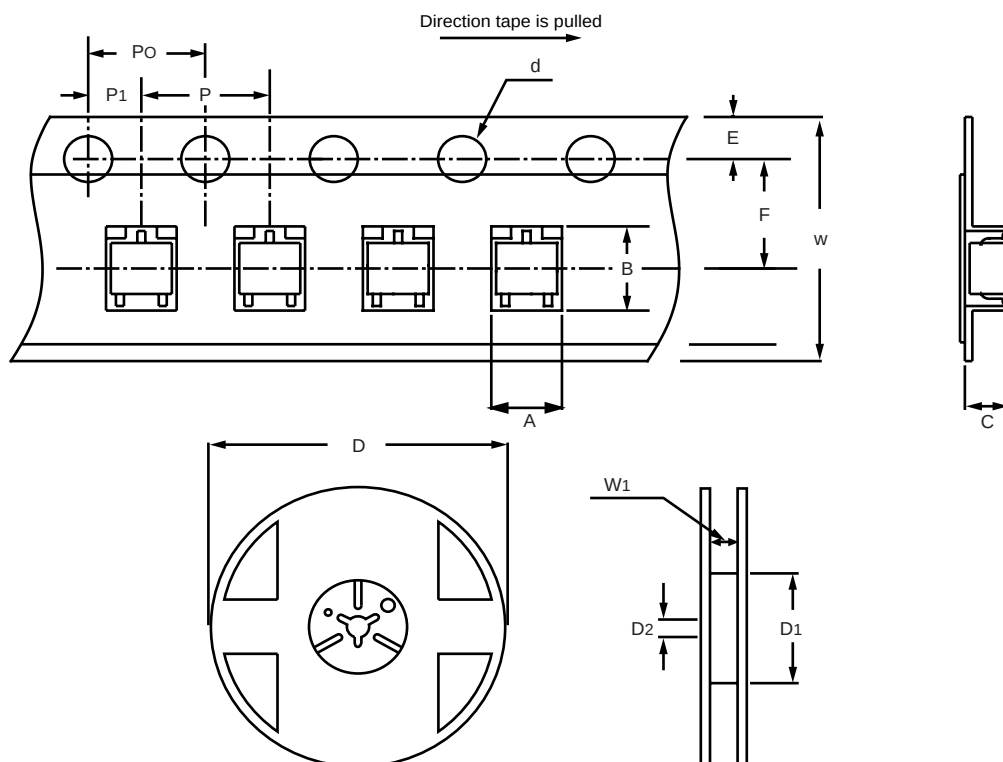
Dimensions in inches and (millimeters)

Rev.A

Reel Taping Sepecification - Surface Mount Device/SOT-23

Reel Packing

PACKAGE	PER REEL EA	REEL DIA (m/m)	BOX SIZE (m/m)	PER BOX EA	CARTION (m/m)	PER CARTION EA	GROSS WEIGHT (Kg)
SOT-23	3,000	178	192*195*136	30,000	440*410*410	360,000	15.0



ITEM	SYMBOL	SPECIFICATIONS (mm)	SPECIFICATIONS (inch)
Carrier width	A	3.1±0.1	0.122±0.004
Carrier length	B	2.85±0.1	0.112±0.004
Carrier depth	C	1.40±0.1	0.055±0.004
Sprocket hole	d	1.5 + 0.1/-0	0.059 + 0.004/-0
Reel outside diameter	D	180 + 0/-3	7.083 + 0/-0.118
Reel inner diameter	D1	60 + 1/-0	2.361 + 0.039/-0
Feed hole diameter	D2	13±0.2	0.512±0.008
Sprocket hole position	E	1.75±0.1	0.069±0.004
Punch hole position	F	3.5±0.05	0.138±0.002
Punch hole pitch	P	4.0±0.1	0.157±0.004
Sprocket hole pitch	P0	4.0±0.1	0.157±0.004
Embossment center	P1	2.0±0.05	0.079±0.002
Tape width	W	8.0±0.2	0.315±0.008
Reel width	W1	9.0±0.3	0.354±0.012

NOTE: 1.Devices are packed in accordance with EIAJ stand ETX-7001 and specifications listed above.

2.Available on 7 inch (3,000 c.t.) or 13 inch (10,000 c.t.) diameter reels.

Ordering Information:

Device PN	Packing
SE3401GD -T ⁽¹⁾ G ⁽²⁾ -WS	Tape&Reel: 3 Kpcs/Reel

Note: (1) Packing code, Tape & Reel Packing

(2) RoHS product for packing code suffix "G" ; Halogen free product for packing code suffix "H"

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