Descriptions

This is 700V 4.0A N-Channel Power MOSFET in a TO-220/220FPL/251T/252/252T Plastic Package.

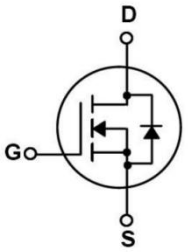
Features

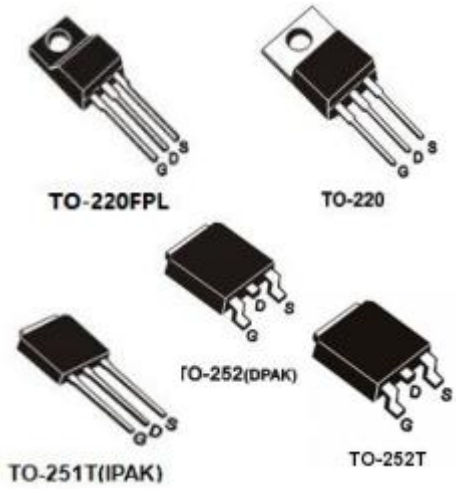
- LOW THERMAL RESISTANCE
- FAST SWITCHING
- HIGH INPUT RESISTANCE
- RoHS COMPLIANT

Applications

- ELECTRONIC BALLAST
- ELECTRONIC TRANSFORMER
- SWITCH MODE POWER SUPPLY

Equivalent Circuit & Pinning





Packaging SPEC

Part	Package	Marking	Packing method
CT4N70RA	TO-220	4N70	TUBE PACKING
CT4N70FP	TO-220FPL	4N70	TUBE PACKING
CT4N70IP	TO-251T	4N70	TUBE PACKING
CT4N70DP	TO-252	4N70	TUBE PACKING / TAPE & REEL PACKING
CT4N70DPT	TO-252T	4N70	TUBE PACKING / TAPE & REEL PACKING

Absolute Maximum Ratings(Ta=25℃)

PARAMETER	SYMBOL	VALUE	UNIT
Drain-source Voltage	V_{DS}	700	V
gate-source Voltage	V_{GS}	±30	V
Continuous Drain Current TC=25℃	I_D	4.0	A
Continuous Drain Current TC=100℃	I_D	2.4	A
Drain Current —Pulsed ①	I_{DM}	16	A
Power Dissipation	P_{tot}	TO-220:106 TO-220FPL/251T/252(T):36	W
Junction Temperature	Tj	150	。C
Storage Temperature	T_{STG}	-55-150	。C
Single Pulse Avalanche Energy ②	E_{AS}	260	mJ

Electrical Characteristics(Ta=25℃)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Drain-source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	700			V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DS}/\Delta Tj$	ID=250uA, Referenced to 25。C		0.65		V/。C
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS}, I_D=250μA	2.0		4.0	V
Drain-source Leakage Current	I_{DSS}	V_{DS} =700V, V_{GS} =0V, Tj=25。C			1	μA
		V_{DS} =560V, V_{GS} =0V, Tj=125。C			100	μA
Forward Transconductance	gfs	V_{DS} =15V, I_D=2.0A③		4.0		S

Electrical Characteristics(Ta=25℃)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Gate-body Leakage Current (V_{DS} = 0)	I_{GSS}	V_{GS} =±30V			±100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	V_{GS} =10V, I_D=2.0A ③		2.5	2.8	Ω
Input Capacitance	Ciss	V_{GS} = 0V, V_{DS} =25V F = 1.0MHZ		600		pF
Output Capacitance	Coss			50		
Reverse transfer Capacitance	Crss			10		
Turn -Off Delay Time	Td(off)	V_{DD}=350V, I_D =4.0A R_G=25Ω ③		25		ns
Total Gate Charge	Qg	I_D =4.0A, V_{DS} = 560V V_{GS} = 10V ③		13.8		nC
Gate-to-Source Charge	Qgs			2.9		nC
Gate-to-Drain Charge	Qgd			4.3		nC
Continuous Diode Forward Current	I_S				4.0	A
Diode Forward Voltage	V_{SD}	Tj=25°C, Is=4.0A V_{GS} =0V ③			1.4	V
Reverse Recovery Time	trr	Tj=25°C,If=4.0A di/dt=100A/μs ③		250		ns
Reverse Recovery Charge	Qrr			1.5		uC

Thermal Characteristics

PARAMETER	SYMBOL	MAX		UNIT
		TO-220	TO-220FPL/251/252(T)	
Thermal Resistance Junction-case	Rth_{JC}	1.18	3.47	℃/W
Thermal Resistance Junction-ambient	Rth_{JA}	62.5	62.5	℃/W

Notes:
①Repetitive rating: Pulse width limited by maximum junction temperature
② Starting Tj=25oC, VDD =50V, L=32mH, RG =25Ω, IAS=4.0A
③ Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%

Electrical Characteristic Curve

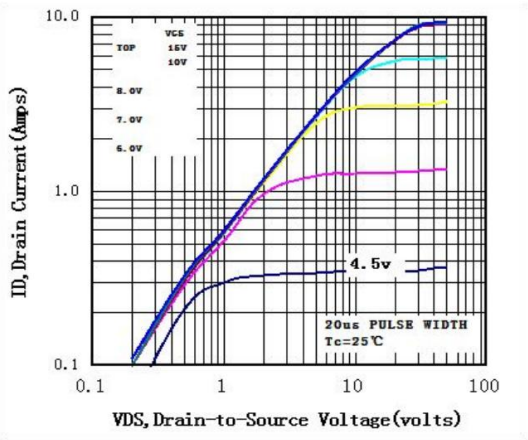


图 1 输出特性曲线, Tc=25℃

Fig1 Typical Output Characteristics, Tc=25℃

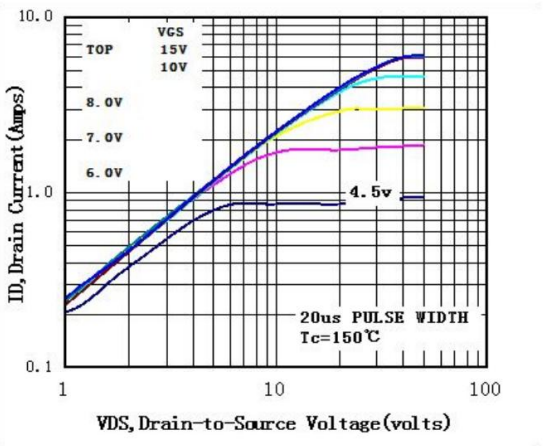


图 2 输出特性曲线, Tc=150℃

Fig2 Typical Output Characteristics, Tc=150℃

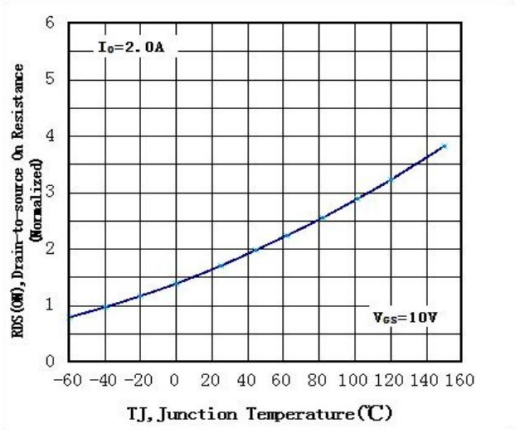


图 3 归一化导通电阻与温度曲线

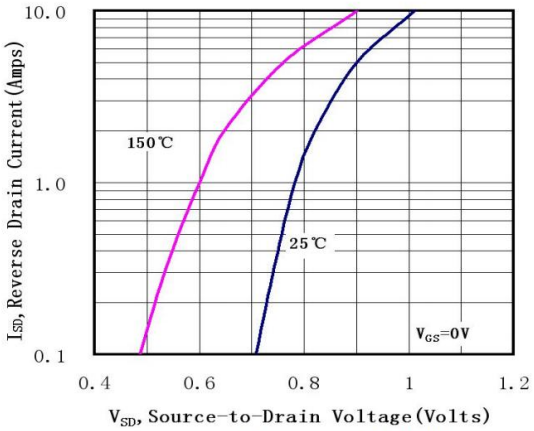


图 4 二极管正向电压曲线

Fig3 Normalized Resistance Vs.Temperature

Fig4 Typical Source-Drain Diode Forward Voltage

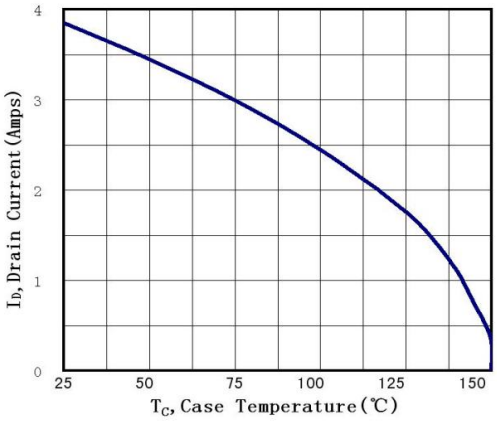


图 5 最大漏极电流与壳温曲线

Electrical Characteristic Curve

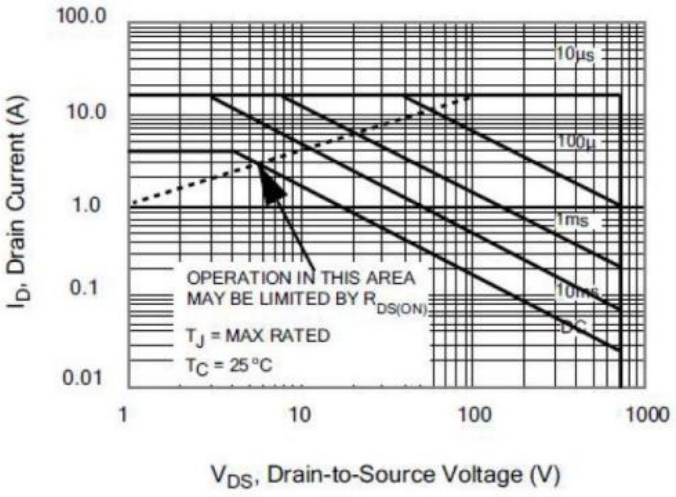


图 6-1 SIF4N70F(TO-220)
最大安全工作区曲线
Fig6-1 Maximum Safe Operating Area

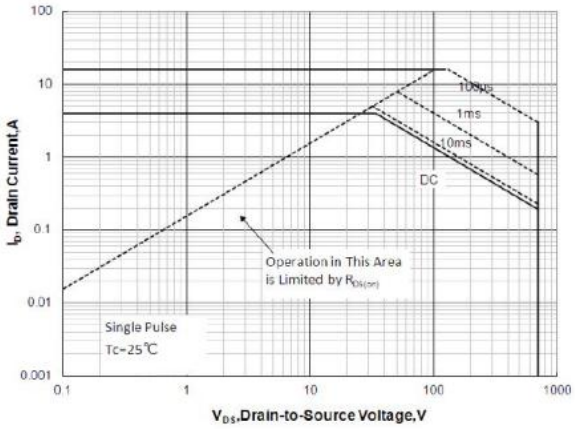


图 6-2 SIF4N70F(TO-220FP/251T/252(T))
最大安全工作区曲线

Marking Instructions

COT
4N70
******

Note:

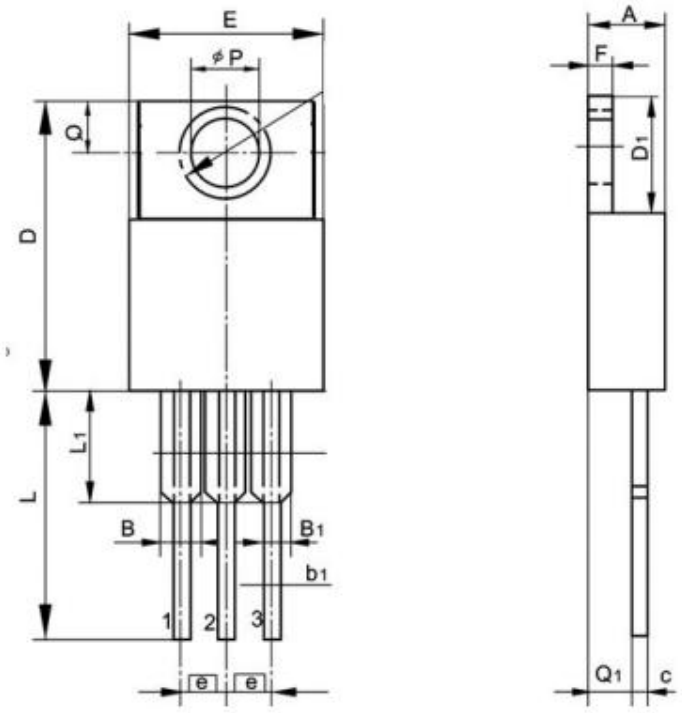
COT:	Company Code
4N70:	Product Type.
******:	*: Inner Code * : Year Code **: Week Code **: Lot Code.

Package Outline Dimensions

TO-220 封装机械尺寸
TO-220 MECHANICAL DATA

单位：毫米/UNIT：mm

符号 SYMBOL	最小值 min	典型值 nom	最大值 max	符号 SYMBOL	最小值 min	典型值 nom	最大值 max
A	4.00		4.80	E	9.90		10.70
B	1.20		1.50	e		2.54	
B1	1.00		1.40	F	1.10		1.45
b1	0.65		1.00	L	12.50		14.50
c	0.35		0.75	L1	3.00	3.50	4.00
D	15.00		16.50	Q	2.50		3.00
D1	5.90		6.90	Q1	2.00		3.00
				ϕP	3.60		3.90

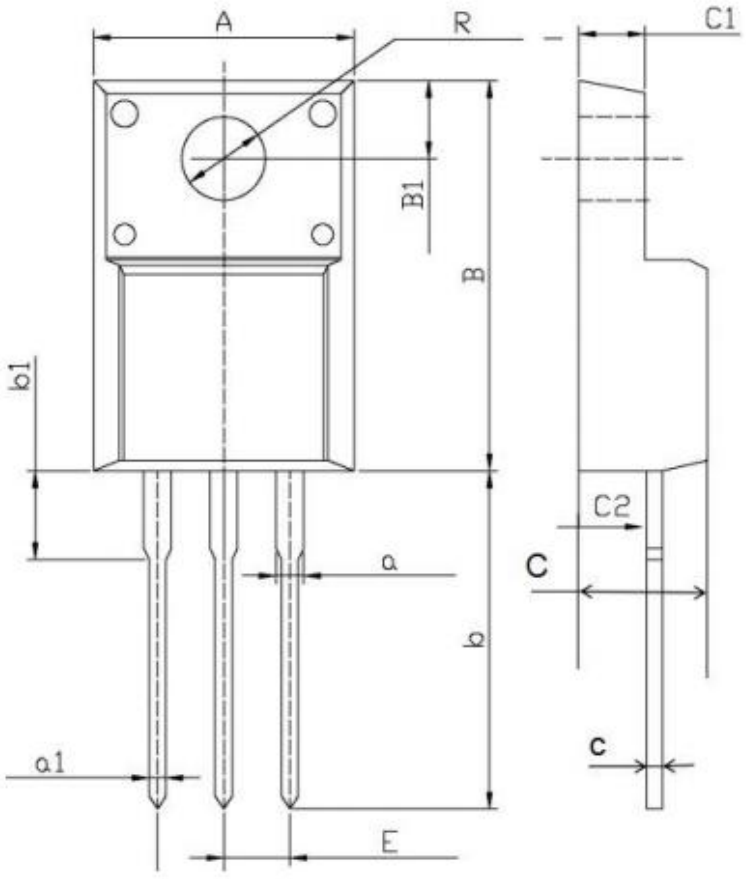


Package Outline Dimensions

TO-220FPL 封装机械尺寸
TO-220FPL MECHANICAL DATA

单位:毫米/UNIT：mm

符号 SYMBOL	最小值 min	典型值 nom	最大值 max	符号 SYMBOL	最小值 min	典型值 nom	最大值 max
A	9.90		10.36	a	1.08		1.48
B	15.40		16.40	a1	0.70		0.90
B1	3.05		3.55	E	2.34		2.75
C	4.40		5.00	C1	2.25		2.85
c	0.40		0.60	C2	2.45		3.05
b	12.40		13.50	R	2.90		3.35
b1	2.60		3.60				



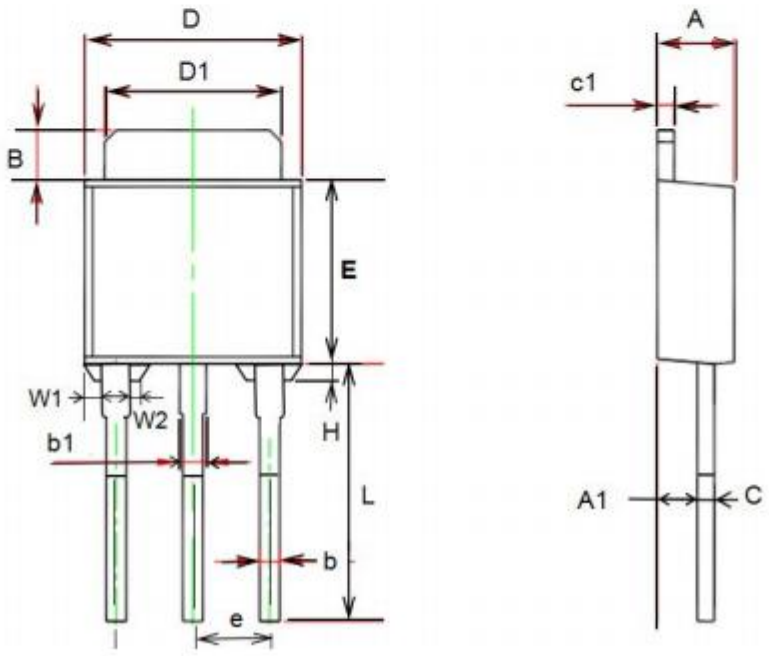
Package Outline Dimensions

TO-251T 封装机械尺寸
TO-251T (IPAK) MECHANICAL DATA

单位:毫米/UNIT：mm

符号/SYMBOL	最小值/min	典型值/nom	最大值/max
A	2.10		2.50
A_1	0.95		1.30
B	0.80		1.25
b	0.50		0.80
b_1	0.70		0.80
c	0.45		0.70
c1	0.45		0.70
D	6.35		6.80
D_1	5.10		5.50
E	5.30		6.30
e	2.25	2.30	2.35
L	7.00		9.20
H	0.35		0.45
W1	0.30		0.50
W2	0.20		0.40

[S/L]

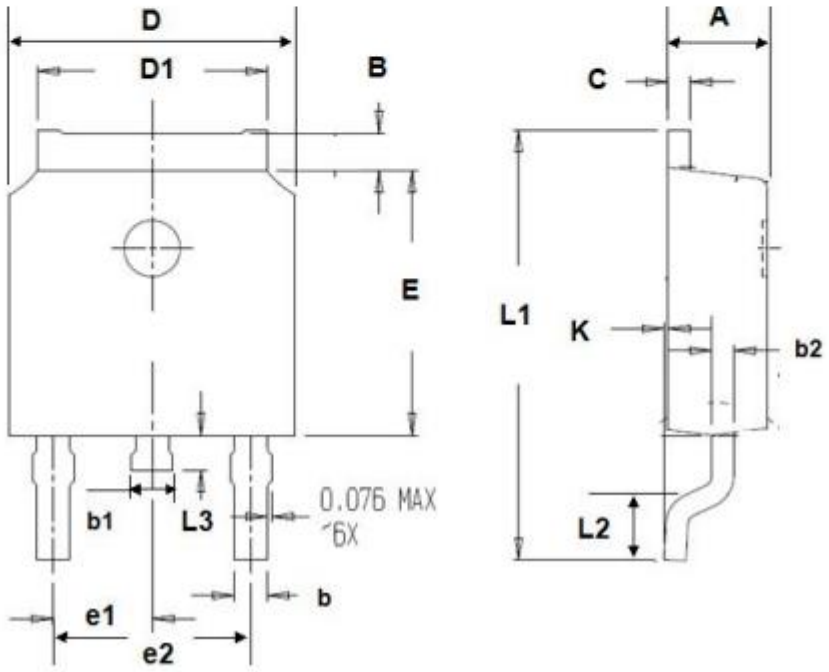


Package Outline Dimensions

TO-252 封装机械尺寸
TO-252 MECHANICAL DATA

单位:毫米/UNIT：mm

符号 SYMBOL	最小值 min	最大值 max	符号 SYMBOL	最小值 min	最大值 max
A	2.10	2.50	B	0.85	1.25
b	0.50	0.80	**b1**	**0.70**	**1.20**
b2	0.45	0.70	C	0.45	0.70
D	6.30	6.75	D1	5.10	5.50
E	5.30	6.30	e1	2.25	2.35
L1	9.20	10.60	e2	4.45	4.75
L2	0.90	1.75	L3	0.60	1.10
K	0.00	0.23			

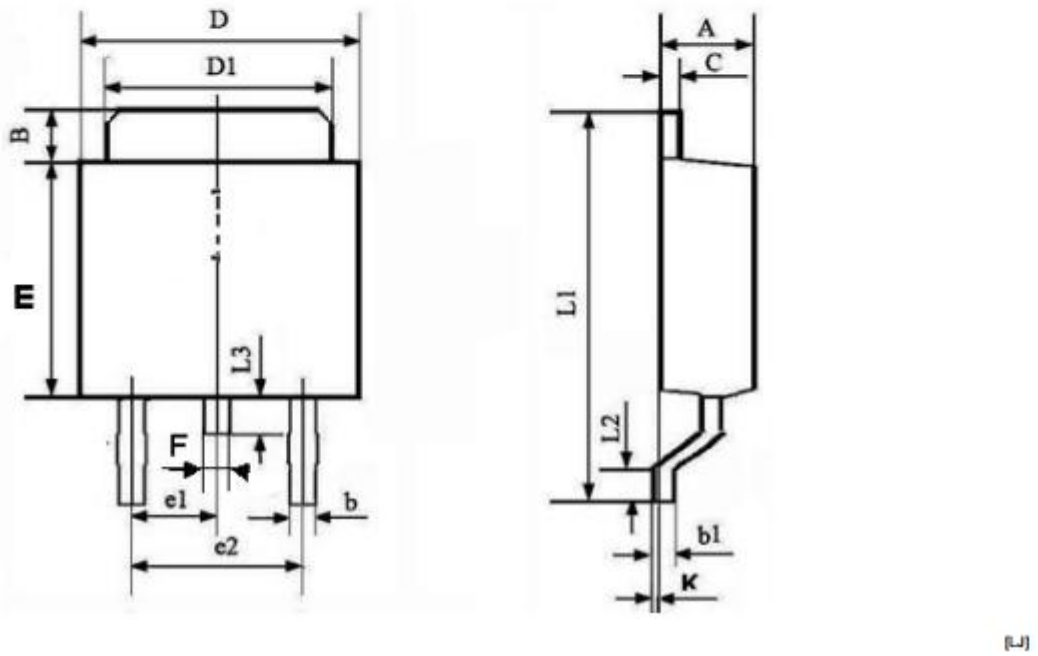


Package Outline Dimensions

TO-252T 封装机械尺寸
TO-252T MECHANICAL DATA

单位:毫米/UNIT：mm

符号 SYMBOL	最小值 min	最大值 max	符号 SYMBOL	最小值 min	最大值 max
A	2.20	2.40	B	0.85	1.25
b	0.50	0.80	C	0.45	0.70
b1	0.45	0.70	D	6.30	6.70
D1	5.10	5.50	E	5.30	6.20
L1	9.20	10.60	F	0.50	0.90
L2	0.90	1.50	e1	2.25	2.35
L3	0.60	1.10	e2	4.50	4.70
			K	0.00	0.18

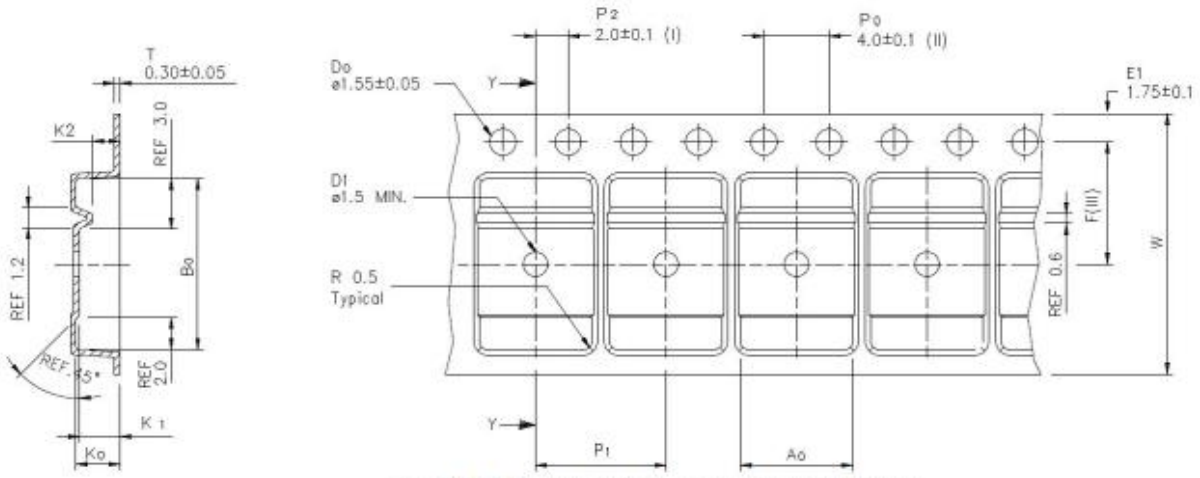


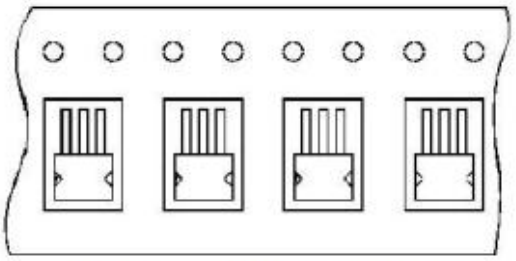
Package Outline Dimensions

TO-252 编带规格尺寸
TO-252 TAPE AND REEL DATA

单位:毫米/UNIT：mm

符号 SYMBOL	最小值 min	典型值 nom	最大值 max	符号 SYMBOL	最小值 min	典型值 nom	最大值 max
A0	6.80	6.90	7.00	B0	10.40	10.50	10.60
K0	2.60	2.70	2.90	K1	2.40	2.50	2.60
F	7.40	7.50	7.60	K2	1.60	1.70	1.80
W	15.90	16.00	16.10	P1	7.90	8.00	8.10





编带器件定位/UNIT ORIENTATION