

DIGITAL TRANSISTOR

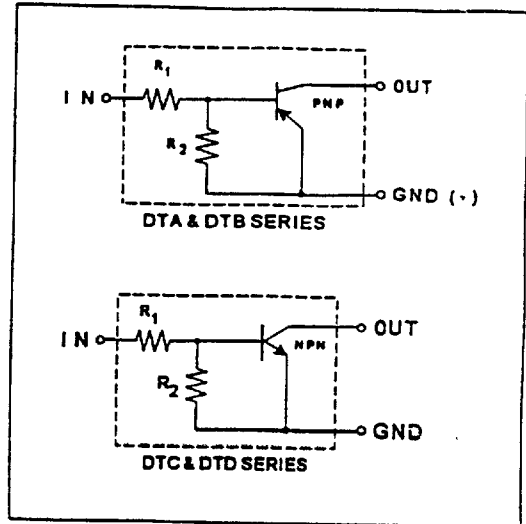
APPLICATION:

- Inverter, Driver & Interface Circuits

FEATURES:

- Replaces up to three parts (1 transistor & 2 resistors) with one part
- Available in a variety of surface mount or leaded (thru-hole) packages
- High packing density requires less board space
- Cost savings due to fewer components to purchase & stock & handle
- Improved reliability due to reduced number of components
- Available in PNP & NPN polarities
- Available in 100 mA & 500 mA devices
- Decreased parasitic effects
- Double diffused silicon, Epitaxial Planar Transistor with thin film internal bias resistors

EQUIVALENT CIRCUITS:



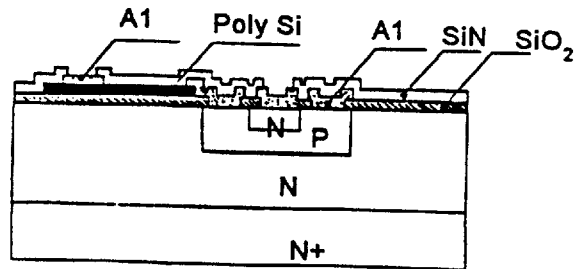
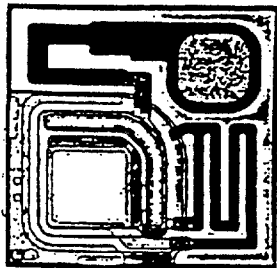
MAXIMUM RATINGS:

PARAMETER	PNP		NPN		UNITS
	DTA	DTB	DTC	DTD	
Power Supply Voltage (V_{cc})	50	50	50	50	Volts
Collector Current (I_c)	100	500	100	500	mA
Junction Temperature (T_j)	+125	+125	+125	+125	$^{\circ}C$
Storage Temperature (T_{stg})	-55 to +125	-55 to +125	-55 to +125	-55 to +125	$^{\circ}C$
Power Dissipation (P_d)	Rated by Package -- See Table Below				mW

MAXIMUM POWER DISSIPATION BY PACKAGE: P_d (mW)

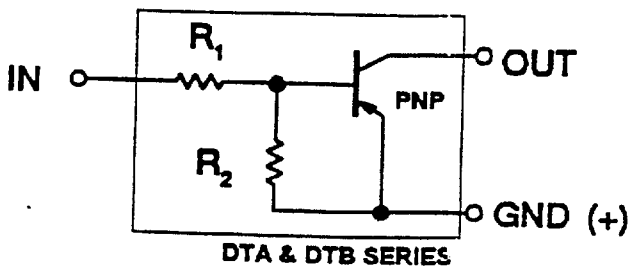
Test Condition	SURFACE MOUNT DEVICES				THRU-HOLE (LEADED) DEVICES				
	SST (SOT-23)	SMT (SC-59)	UMT	EM3	SPT (TO-92S)	ATR	ATV	FTR	FTL
Free Air/PCB	200	200	200	150	300	300	300	300	300
Ceramic Substrate	350	350	350	250	—	—	—	—	—

DIGITAL TRANSISTOR CONSTRUCTION:

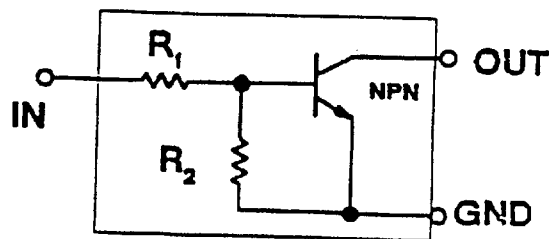


7828999 0014555 SOT

• Digital Transistor Summary Table



DTA & DTB SERIES



DTC & DTD SERIES

Resistor Values		PNP $I_c(\text{Max}) = 100 \text{ mA}$ 2N3908	PNP $I_c(\text{Max}) = 600 \text{ mA}$ PN2907A/2N4403	NPN $I_c(\text{Max}) = 100 \text{ mA}$ 2N3904	NPN $I_c(\text{Max}) = 500 \text{ mA}$ PN2222A/2N4401
R_1	R_2				
1/K 1/K 1/K	1K NONE 10K	- DTA 113T DTA 113Z	DTB 113E - DTB 113Z	- - DTC 113Z	DTD 113E - DTD 113Z
10K 0 10K 10K 10K	10K 10K NONE 4.7K 47K	DTA 114E DTA 114G DTA 114T DTA 114W DTA 114Y/DTA 214Y	DTB 114E - DTB 114T - -	DTC 114E DTC 114G DTC 114T/DTC 314T * DTC 114W DTC 114Y	DTD 114E DTD 114G DTD 114T - -
100K 0 100K 100K	100K 100K NONE 10K	DTA 115E DTA 115G DTA 115T DTA 115U	- - - -	DTC 115E DTC 115G DTC 115T DTC 115U	- - - -
.22K	4.7K	-	DTB 122J	-	DTD 122J
2.2K 2.2K 2.2K 2.2K	2.2K NONE 47K 10K	DTA 123E - DTA 123J DTA 123Y	DTB 123E DTB 123T - DTB 123Y	DTC 123E DTC 323T * DTC 123J DTC 123Y	DTD 123E DTD 123T - DTD 123Y
2.7K	1K	DTA 1D3R	-	DTC 1D3R	-
22K 0 22K 22K 22K	22K 22K NONE 47K	DTA 124E DTA 124G DTA 124T DTA 124X	- - - -	DTC 124E DTC 124G DTC 124T DTC 124X	- - - -
220K	NONE	DTA 125T	-	DTC 125T	-
3.3K	10K	-	DTB 133H	-	DTD 133H
4.7K 4.7K 4.7K 4.7K 4.7K	4.7K NONE 10K 22K 47K	DTA 143E DTA 143T DTA 143X DTA 143Y DTA 143Z	DTB 143E DTB 143T - - -	DTC 143E DTC 143T/DTC 343T * DTC 143X DTC 143Y DTC 143Z	DTD 143E DTD 143T - - -
47K 0 47K 47K 47K	47K 47K NONE 10K 22K	DTA 144E DTA 144G DTA 144T DTA 144V DTA 144W	- - - - -	DTC 144E DTC 144G DTC 144T DTC 144V DTC 144W	- - - - -
6.8K 6.8K	6.8K NONE	- -	- DTB 163T	DTC 363E * DTC 363T *	- DTD 163T

* $I_c = 600 \text{ mA}$

NOTE: See "How to Order" for complete part number

ROHM CORPORATION, Rohm Electronics Division, 3034 Owen Dr., Antioch, TN 37013 (615)641-2020 FAX (615)641-2022

7828999 0014556 446

DIGITAL TRANSISTOR: PNP

ELECTRICAL CHARACTERISTICS: 100 mA Series

Table with 20 columns: PART NUMBER, TYP, RESISTOR VALUE (R1, R2), R2/R1 (Min, Typ, Max), Ic Max, INPUT VOLT (Min, Max), hFE (Min, Vce, Ic), Icbo, Iebo, PART MARK, DIE TYPE, EQUIVALENT CIRCUIT.

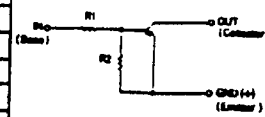


Table with 20 columns: PART NUMBER, TYP, RESISTOR VALUE (R1, R2), Vcbo, Vceo, Vcbo, Ic Max, hFE (Min, Typ, Max, Vce, Ic), Icbo, Iebo, PART MARK, DIE TYPE, EQUIVALENT CIRCUIT.

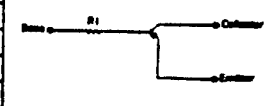
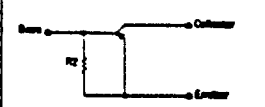


Table with 20 columns: PART NUMBER, TYP, RESISTOR VALUE (R1, R2), Vcbo, Vceo, Vcbo, Ic Max, hFE (Min, Typ, Max, Vce, Ic), Icbo, Iebo, PART MARK, DIE TYPE, EQUIVALENT CIRCUIT.



ELECTRICAL CHARACTERISTICS: 500 mA Series

Table with 20 columns: PART NUMBER, TYP, RESISTOR VALUE (R1, R2), R2/R1 (Min, Typ, Max), Ic Max, INPUT VOLT (Min, Max), hFE (Min, Vce, Ic), Icbo, Iebo, PART MARK, DIE TYPE, EQUIVALENT CIRCUIT.

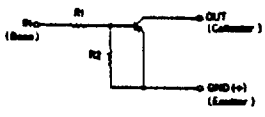
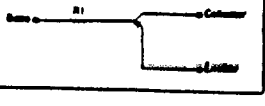


Table with 20 columns: PART NUMBER, TYP, RESISTOR VALUE (R1, R2), Vcbo, Vceo, Vcbo, Ic Max, hFE (Min, Typ, Max, Vce, Ic), Icbo, Iebo, PART MARK, DIE TYPE, EQUIVALENT CIRCUIT.



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DIGITAL TRANSISTOR: NPN
ELECTRICAL CHARACTERISTICS: 100 mA Series

Table with 23 columns: PART NUMBER, Vin(off) (Max, Vce, Ic), Vin(on) (Min, Vce, Ic), Vo(on) (TYP, Max, Ic, Ib), Ib (Max, Vin), Ic(OFF) (Max, Vce, Vin), Vce(SAT) (Max, Ic, Ib), Cob @ F=1MHz (TYP, Max, Vcb, Ie), CUT-OFF FREQ (ft, Vce, Ic). Rows include DTC113Z, DTC114E, DTC114W, DTC114Y, DTC115E, DTC115U, DTC123E, DTC123J, DTC123Y, DTC124E, DTC124X, DTC143E, DTC143X, DTC143Y, DTC143Z, DTC144E, DTC144V, DTC144W, DTC214Y, DTC1D3R.

Table with 23 columns: PART NUMBER, Vin(off) (Max, Vce, Ic), Vin(on) (Min, Vce, Ic), Vo(on) (TYP, Max, Ic, Ib), Ib (Max, Vin), Ic(OFF) (Max, Vce, Vin), Vce(SAT) (Max, Ic, Ib), Cob @ F=1MHz (TYP, Max, Vcb, Ie), CUT-OFF FREQ (ft, Vce, Ic). Rows include DTC143T, DTC114T, DTC124T, DTC144T, DTC115T, DTC125T, DTC113T.

Table with 23 columns: PART NUMBER, Vin(off) (Max, Vce, Ic), Vin(on) (Min, Vce, Ic), Vo(on) (TYP, Max, Ic, Ib), Ib (Max, Vin), Ic(OFF) (Max, Vce, Vin), Vce(SAT) (Max, Ic, Ib), Cob @ F=1MHz (TYP, Max, Vcb, Ie), CUT-OFF FREQ (ft, Vce, Ic). Rows include DTC114G, DTC124G, DTC144G, DTC115G, DTD114G.

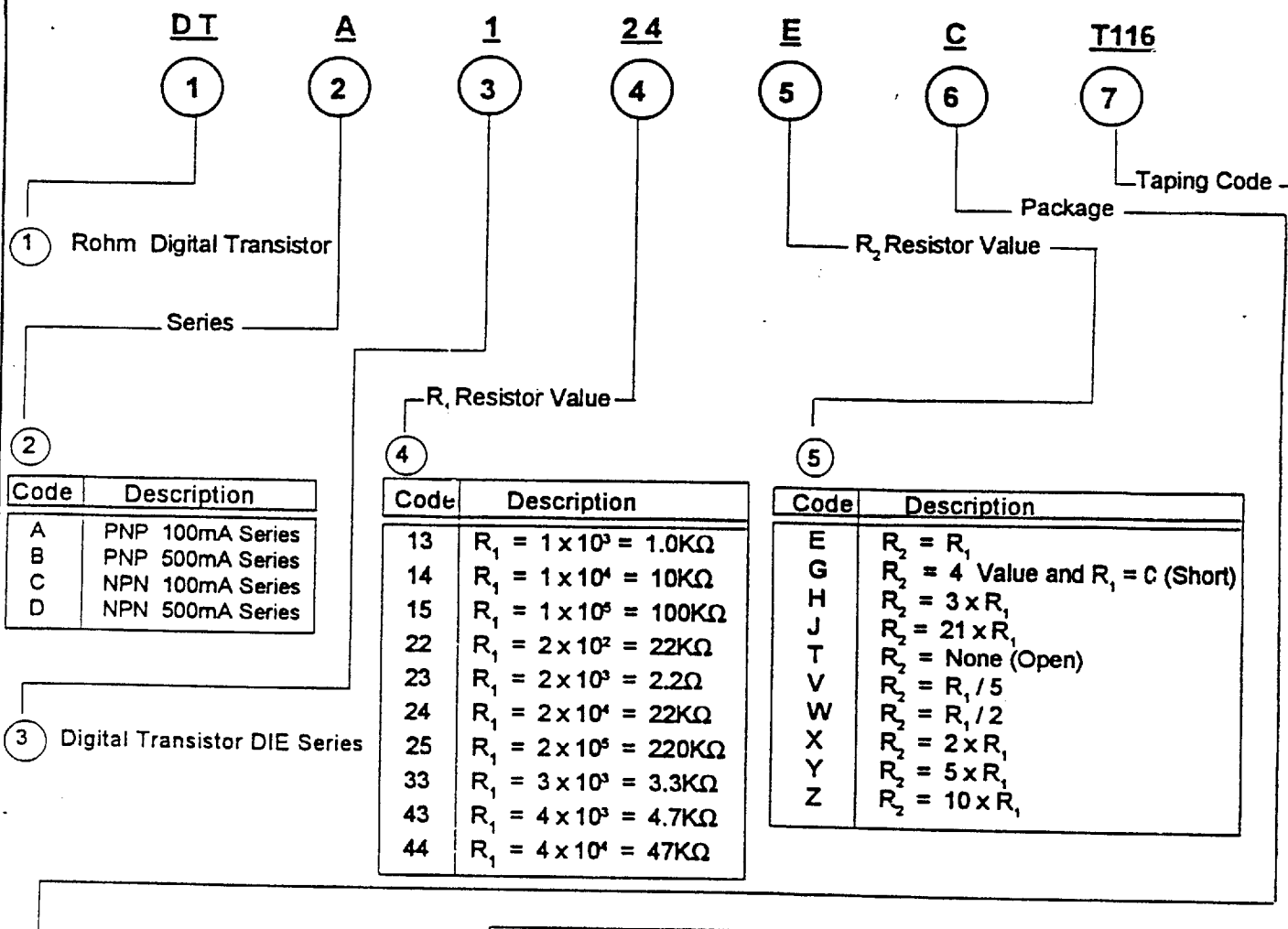
ELECTRICAL CHARACTERISTICS: 500 mA Series

Table with 23 columns: PART NUMBER, Vin(off) (Max, Vce, Ic), Vin(on) (Min, Vce, Ic), Vo(on) (TYP, Max, Ic, Ib), Ib (Max, Vin), Ic(OFF) (Max, Vce, Vin), Vce(SAT) (Max, Ic, Ib), Cob @ F=1MHz (TYP, Max, Vcb, Ie), CUT-OFF FREQ (ft, Vce, Ic). Rows include DTD113E, DTD113Z, DTD114E, DTD123E, DTD143E, DTD123Y, DTD122J, DTD133H.

Table with 23 columns: PART NUMBER, Vin(off) (Max, Vce, Ic), Vin(on) (Min, Vce, Ic), Vo(on) (TYP, Max, Ic, Ib), Ib (Max, Vin), Ic(OFF) (Max, Vce, Vin), Vce(SAT) (Max, Ic, Ib), Cob @ F=1MHz (TYP, Max, Vcb, Ie), CUT-OFF FREQ (ft, Vce, Ic). Rows include DTD123T, DTD143T, DTD163T, DTD114T.

• Digital Transistors

HOW TO ORDER:



Code	Description
A	PNP 100mA Series
B	PNP 500mA Series
C	NPN 100mA Series
D	NPN 500mA Series

Code	Description
13	R ₁ = 1 × 10 ³ = 1.0KΩ
14	R ₁ = 1 × 10 ⁴ = 10KΩ
15	R ₁ = 1 × 10 ⁵ = 100KΩ
22	R ₁ = 2 × 10 ² = 22KΩ
23	R ₁ = 2 × 10 ³ = 2.2KΩ
24	R ₁ = 2 × 10 ⁴ = 22KΩ
25	R ₁ = 2 × 10 ⁵ = 220KΩ
33	R ₁ = 3 × 10 ³ = 3.3KΩ
43	R ₁ = 4 × 10 ³ = 4.7KΩ
44	R ₁ = 4 × 10 ⁴ = 47KΩ

Code	Description
E	R ₂ = R ₁
G	R ₂ = 4 Value and R ₁ = C (Short)
H	R ₂ = 3 × R ₁
J	R ₂ = 21 × R ₁
T	R ₂ = None (Open)
V	R ₂ = R ₁ / 5
W	R ₂ = R ₁ / 2
X	R ₂ = 2 × R ₁
Y	R ₂ = 5 × R ₁
Z	R ₂ = 10 × R ₁

	PKG	DESCRIPTION	TAPING CODE	DESCRIPTION	PKG. QTY.	PACKAGE SIZE
SURFACE MOUNT	K	SMT (SC-59/JAPANESE SOT-23)	* T146	1 PIN SIDE ON FEED HOLE SIDE	3,000	178mm/7" Reel
			* T147	2 PIN SIDE ON FEED HOLE SIDE	3,000	178mm/7" Reel
			* T246	1 PIN SIDE ON FEED HOLE SIDE	10,000	330mm/13" Reel
	C	SST (EUROPEAN SOT-23)	* T116	1 PIN SIDE ON FEED HOLE SIDE	3,000	178mm/7" Reel
			* T117 * T216	2 PIN SIDE ON FEED HOLE SIDE 1 PIN SIDE ON FEED HOLE SIDE	3,000 10,000	178mm/7" Reel 330 mm/13" Reel
U	UMT (DTA & DTC ONLY)	* T106	1 PIN SIDE ON FEED HOLE SIDE	3,000	178 mm/7" Reel	
		T107	2 PIN SIDE ON FEED HOLE SIDE	3,000	178 mm/7" Reel	
E	EM3 (DTA & DTC ONLY)	* TL	1 PIN SIDE ON FEED HOLE SIDE	3,000	178 mm/7" Reel	
		TR	2 PIN SIDE ON FEED HOLE SIDE	3,000	178 mm/7" Reel	
LEADED DEVICES	S	SPT (Short TO-92)	* TP NONE	AMMO BOX RADIAL BULK	5,000 2,000	W-335/H-135/D-40(mm) Polyethylene Bag
	V	ATV	* TV2	AMMO BOX RADIAL	2,500	W-334/H-280/D-41(mm)
			TV3	AMMO BOX RADIAL	2,500	W-334/H-280/D-41(mm)
	L	FTL	* TL2	AMMO BOX RADIAL	2,500	W-334/H-280/D-41(mm)
			TL3	AMMO BOX RADIAL	2,500	W-334/H-280/D-41(mm)
	F	FTR	* NONE C1	BULK TUBE	2,000 8,000	Polyethylene Bag L-565/W-4.2/H-11.5(mm)
A	ATR	* NONE C2	BULK TUBE	2,000 8,000	Polyethylene Bag L-565/W-4.2/H-12.6(mm)	

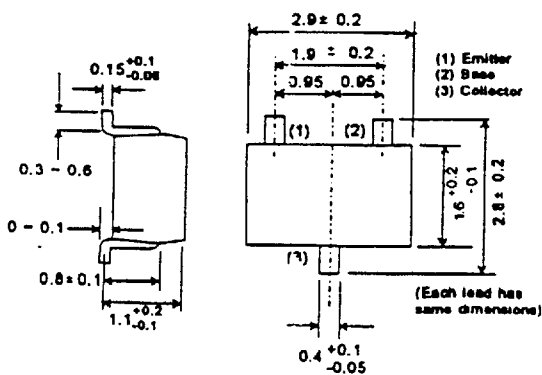
Note: SOT-23, SC-59 and SPT packages are standard products.

* Standard Taping Codes

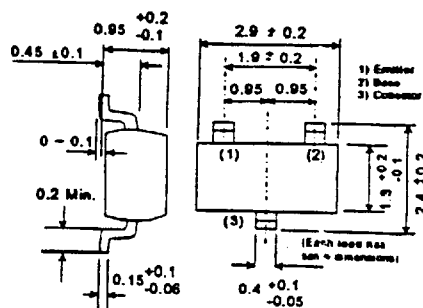
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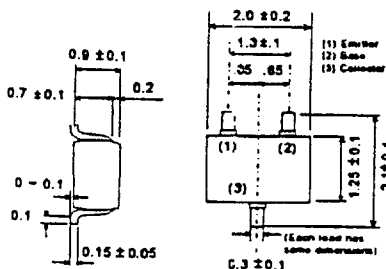
• Surface Mount Packages: Unit (mm)



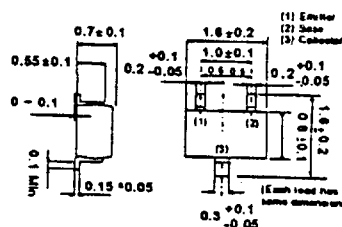
SMT (SC-59/Japanese SOT-23)



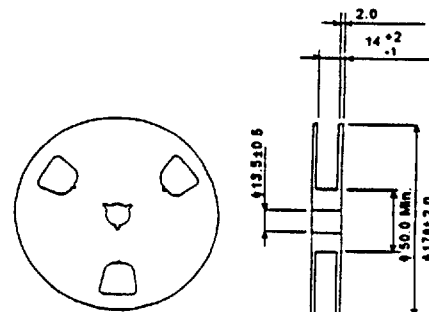
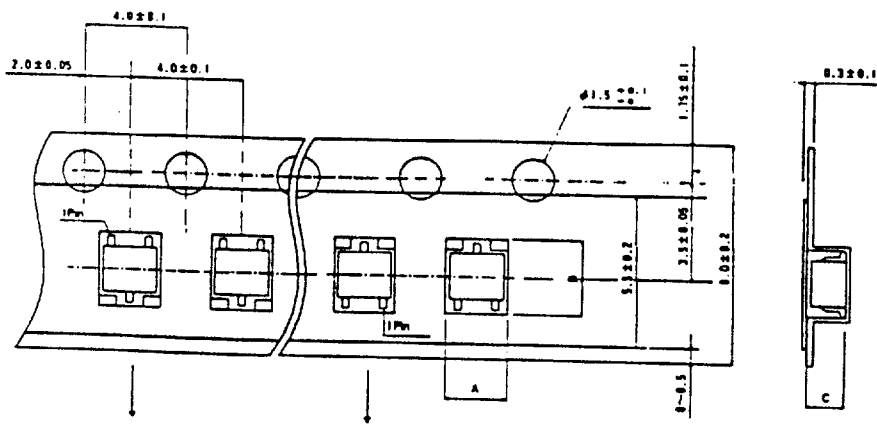
SST (European SOT-23)



UMT



EM3



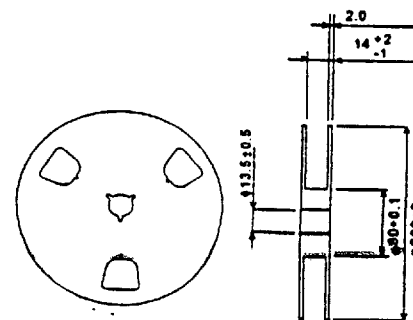
178 mm/7" Reel

Package	Code
SMT	T147
SST	T117
UMT	T107
EM3	TR

Package	Code
SMT	T146/T246
SST	T116/T216
UMT	T106/T206
EM3	TL

Package	Size		
	A	B	C
SMT	3.1 ± 0.2	3.2 ± 0.2	1.35 ± 0.1
SST	3.1 ± 0.2	2.8 ± 0.2	1.25 ± 0.2
UMT	2.2 ± 0.1	2.4 ± 0.1	1.15 ± 0.1
EM3	1.8 ± 0.1	1.8 ± 0.2	0.9 ± 0.2

Tape and Reel Dimensions

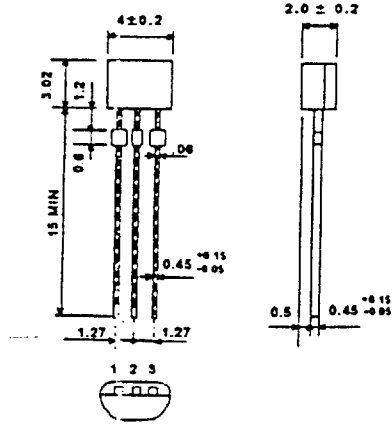


330 mm/13" Reel

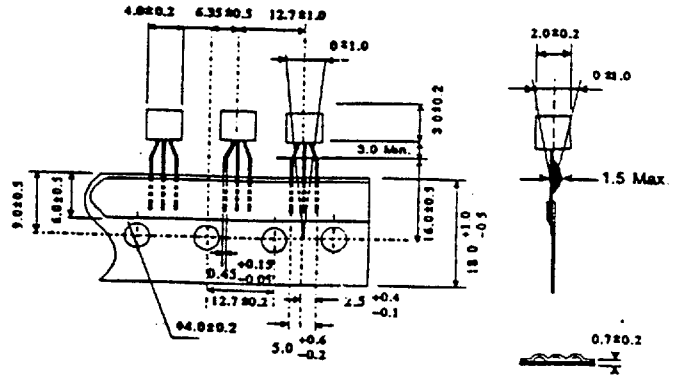
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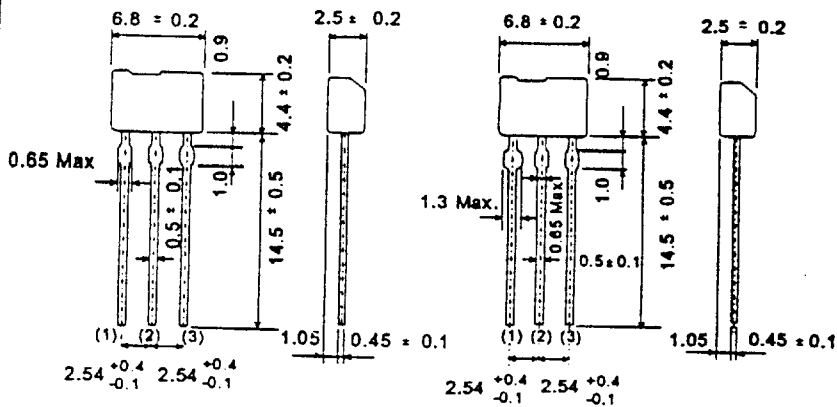
Leaded (thru-hole) Packages



SPT(TO-92S) Package

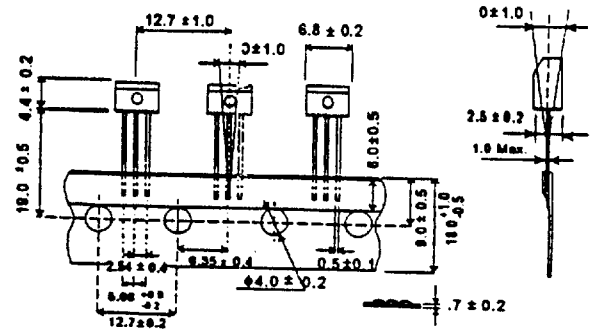


Ammo Box Taping Dimensions

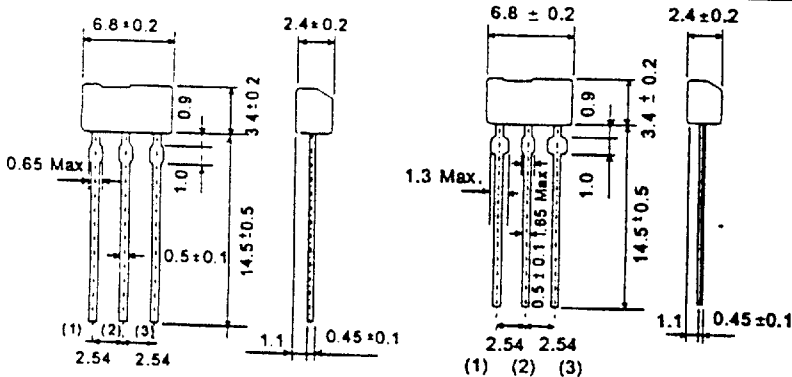


ATV(TV2 Style) Package

ATV(TV3 Style) Package

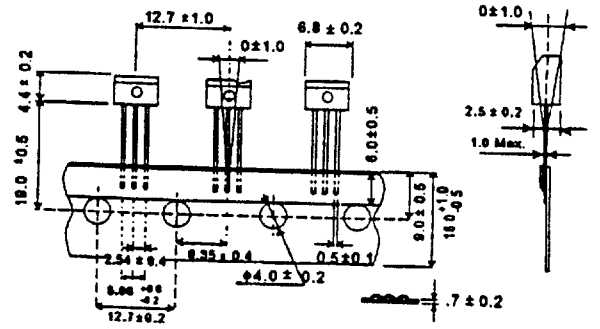


Ammo Box Taping Dimensions

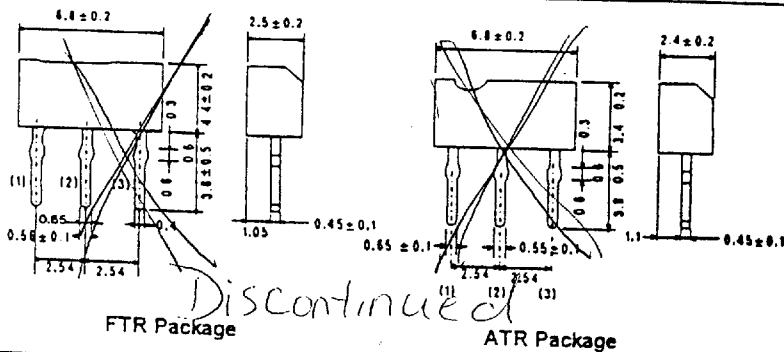


FTL(TL2 Style) Package

FTL(TL3 Style) Package



Ammo Box Taping Dimensions



FTR Package

ATR Package

PKG.	TAPING CODE	DESCRIPTION	PKG. QTY.
SPT(TO-92S)	TP	AMMO BOX RADIAL (Standard)	5,000
	NONE	BULK	2,000
ATV	TV2	AMMO BOX RADIAL (Standard)	2,500
	TV3	AMMO BOX RADIAL	2,500
FTL	TL2	AMMO BOX RADIAL (Standard)	2,500
	TL3	AMMO BOX RADIAL	2,500
FTR	NONE	BULK (Standard)	2,000
ATR	OT	TUBE	8,000
	OT	BULK (Standard)	2,000
ATR	OT	TUBE	8,000
	OT	BULK (Standard)	2,000

Discontinued

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