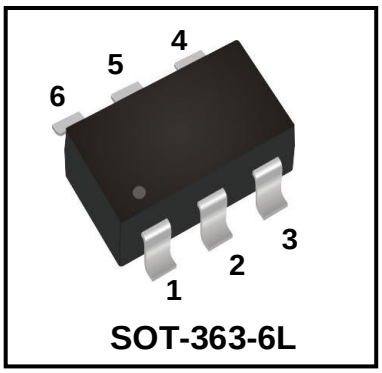
WT3946DW

Dual NPN+PNP Silicon Transistors

Features

- Lead Free Finish
- Ideal for Low Power Amplification and Switching
- Rugged and Reliable

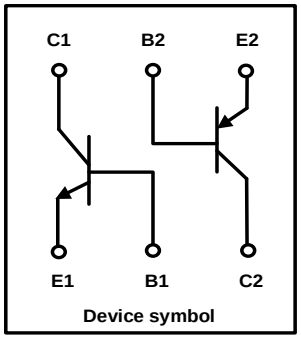


SOT-363-6L

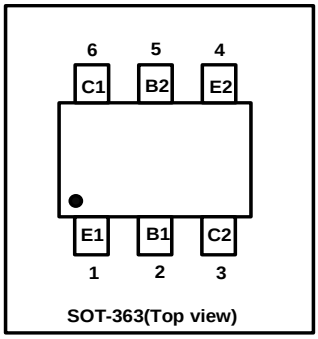
Mechanical Characteristics

- SOT-363-6L Package
- Marking : Making Code
- RoHS Compliant

Schematic & PIN Configuration



Device symbol



SOT-363(Top view)

Absolute Maximum Rating TR1(NPN:P1&P2&P6)

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	60	V
Collector Emitter Voltage	V_{CEO}	40	V
Emitter Base Voltage	V_{EBO}	5	V
Collector Current Continuous	I_C	0.2	A
Collector Power Dissipation	P_C	0.2	W
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55 ~ 150	°C

Absolute Maximum Rating TR2(PNP:P3&P4&P5)

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	-40	V
Collector Emitter Voltage	V_{CEO}	-40	V
Emitter Base Voltage	V_{EBO}	-5	V
Collector Current	I_C	-0.2	A
Collector Power Dissipation	P_C	0.2	W
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	-55 ~ 150	°C

Electrical Characteristics of TR1(NPN) (Tamb=25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = 10μA, I_E = 0	60	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = 1mA, I_B = 0	40	-	-	V
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	I_E = 10μA, I_C = 0	5	-	-	V
Collector Cut-off Current	I_{CBO}	V_{CB} = 30V, I_E = 0	-	-	50	nA
Collector Cut-off Current	I_{CEO}	V_{CE} = 30V, I_B = 0	-	-	500	nA
Emitter Cut-off Current	I_{EBO}	V_{EB} = 5V, I_C = 0	-	-	50	nA
DC Current Gain	$h_{FE(1)}$	V_{CE} = 1V, I_C = 0.1mA	40	-	-	-
	$h_{FE(2)}$	V_{CE} = 1V, I_C = 1mA	70	-	-	-
	$h_{FE(3)}$	V_{CE} = 1V, I_C = 10mA	100	-	300	-
	$h_{FE(4)}$	V_{CE} = 1V, I_C = 50mA	60	-	-	-
	$h_{FE(5)}$	V_{CE} = 1V, I_C = 100mA	30	-	-	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = 10mA, I_B = 1mA	-	-	0.2	V
		I_C = 50mA, I_B = 5mA	-	-	0.3	
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = 10mA, I_B = 1mA	-	-	0.85	V
		I_C = 50mA, I_B = 5mA	-	-	0.95	
Transition Frequency	f_T	V_{CE}=20V, I_C=10mA, f=100MHz	300	-	-	MHz
Collector Output Capacitance	C_{ob}	V_{CB} = 5V, I_E = 0, f=1MHz	-	3.5	-	pF
Noise Figure	NF	V_{CE}=5V,I_C=0.1mA,f=1kHz,R_S=1KΩ	-	-	5	dB
Delay Time	t_d	V_{CC} = 3V, $V_{BE(off)}$ = -0.5V, I_C = 10mA, I_{B1}= -I_{B2}=1mA	-	30	-	nS
Rise Time	t_r		-	30	-	nS
Storage Time	t_s	V_{CC} = 3V, I_C = 10mA, I_{B1} =-I_{B2} =1mA	-	180	-	nS
Fall Time	t_f		-	45	-	nS

Electrical Characteristics of TR2(PNP) (Tamb=25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	I_C = -10μA, I_E = 0	-40	-	-	V
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	I_C = -1mA, I_B = 0	-40	-	-	V
Emitter-Base Bbreakdown Voltage	$V_{(BR)EBO}$	I_E = -10μA, I_C = 0	-5	-	-	V
Collector Cut-off Current	I_{CBO}	V_{CB} = -40V,I_E = 0	-	-	-100	nA
Emitter Cut-off Current	I_{EBO}	V_{EB} = -5V,I_C = 0	-	-	-100	nA
DC Current Gain	$h_{FE(1)}$	V_{CE} = -1V, I_C = -0.1mA	60	-	-	-
	$h_{FE(2)}$	V_{CE} = -1V, I_C = -1mA	80	-	-	-
	$h_{FE(3)}$	V_{CE} = -1V, I_C = -10mA	100	-	300	-
	$h_{FE(4)}$	V_{CE} = -1V, I_C = -50mA	60	-	-	-
	$h_{FE(5)}$	V_{CE} = -1V, I_C = -100mA	30	-	-	-
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	I_C = -10mA,I_B = -1mA	-	-	-0.25	V
		I_C = -50mA,I_B = -5mA	-	-	-0.4	
Base-Emitter Saturation Voltage	$V_{BE(sat)}$	I_C = -10mA,I_B = -1mA	-	-	-0.85	V
		I_C = -50mA,I_B = -5mA	-	-	-0.95	
Transition Frequency	f_T	V_{CE}= -20V,I_C= -10mA,f=100MHz	250	-	-	MHz
Noise Figure	NF	V_{CE}=-5V,I_C=-0.1mA,f=1kHz,R_g=1KΩ	-	-	4	dB
Delay Time	t_d	V_{CC} = -3V, V_{BC} = -0.5V, I_C = -10mA, I_{B1} = I_{B2} = -1mA	-	-	35	ns
Rise Time	t_r		-	-	35	ns
Storage Time	t_s	V_{CC} = -3V, I_C = -10mA, I_{B1} = -I_{B2} = -1mA	-	-	225	ns
Fall Time	t_f		-	-	75	ns

Typical Characteristics of TR1(NPN)

Figure 1. Static Characteristics

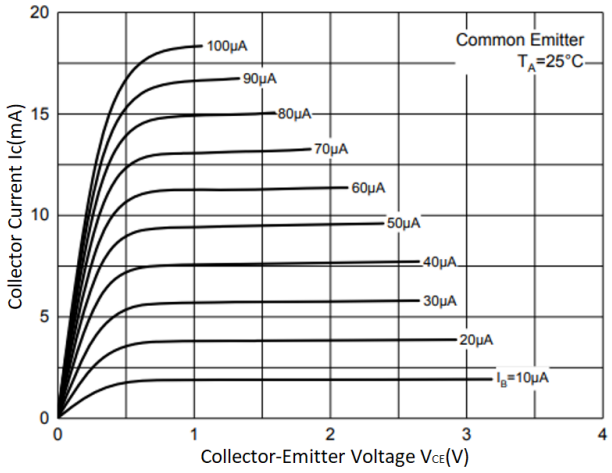


Figure 2. h_{FE} vs. I_C

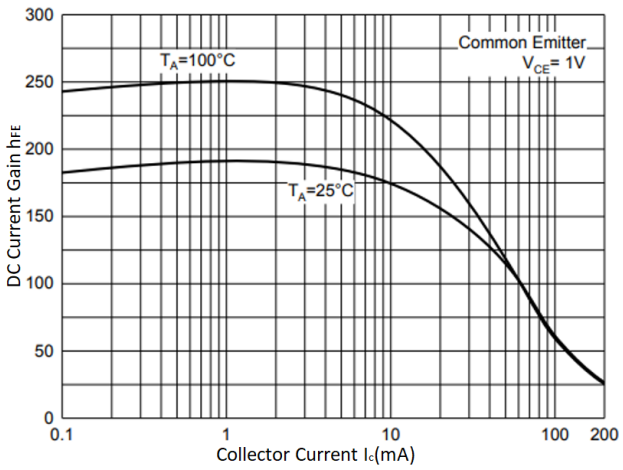


Figure 3. $V_{CE(sat)}$ vs. I_C

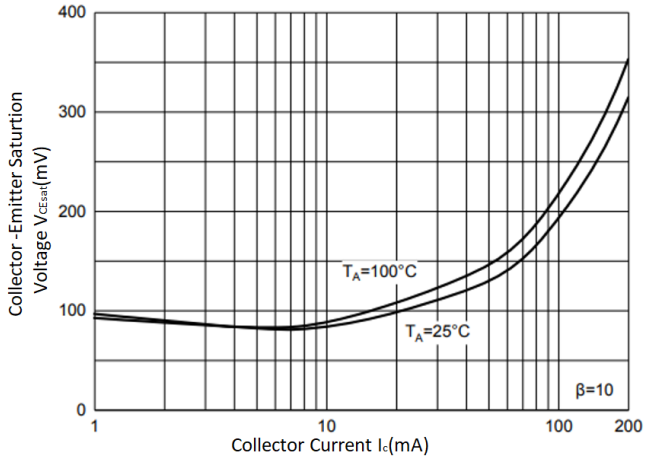


Figure 4. $V_{BE(sat)}$ vs. I_C

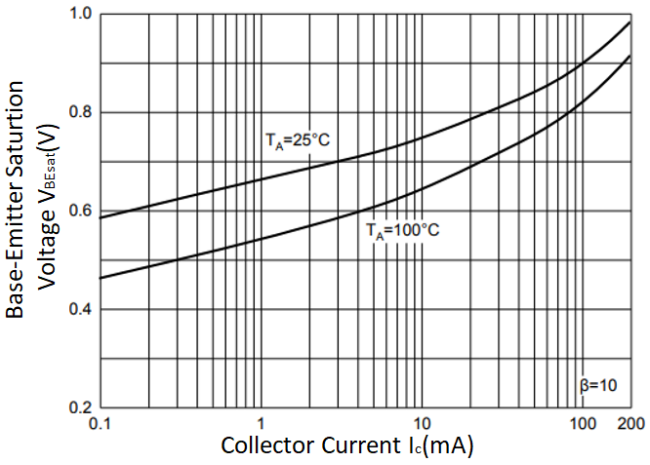


Figure 5. I_C vs. V_{BE}

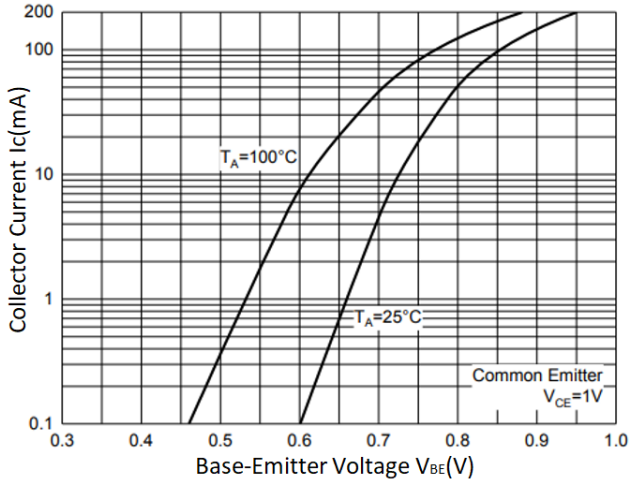
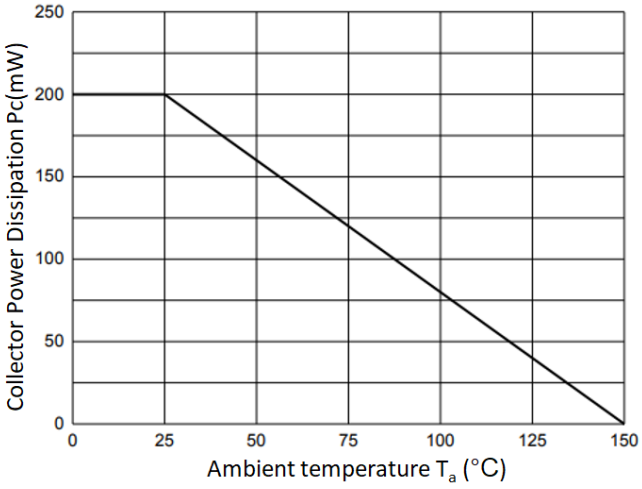


Figure 6. P_C vs. T_a



Typical Characteristics of TR2(PNP)

Figure 1. Static Characteristic

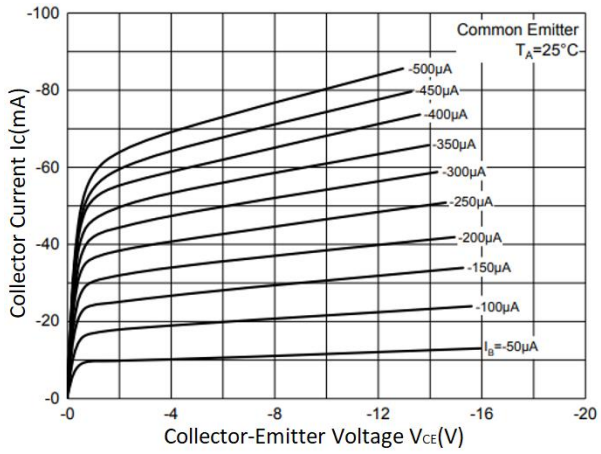


Figure 2. h_{FE} vs. I_C

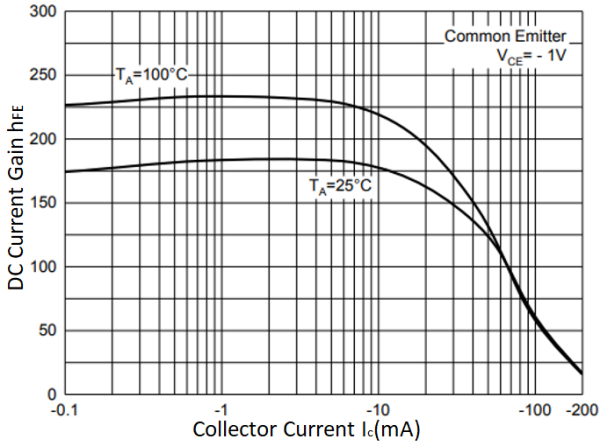


Figure 3. $V_{CE(sat)}$ vs. I_C

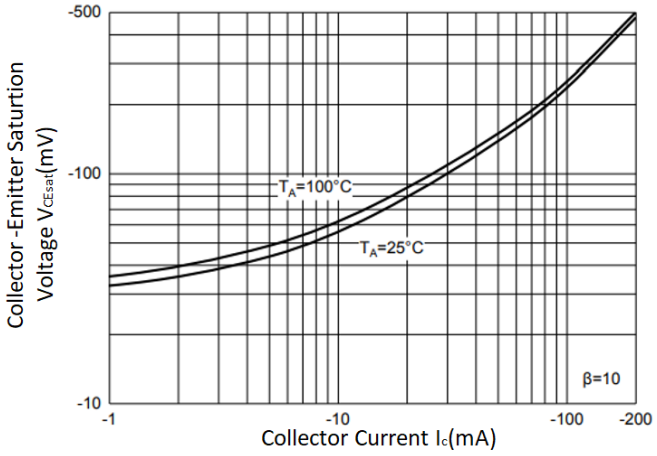


Figure 4. $V_{BE(sat)}$ vs. I_C

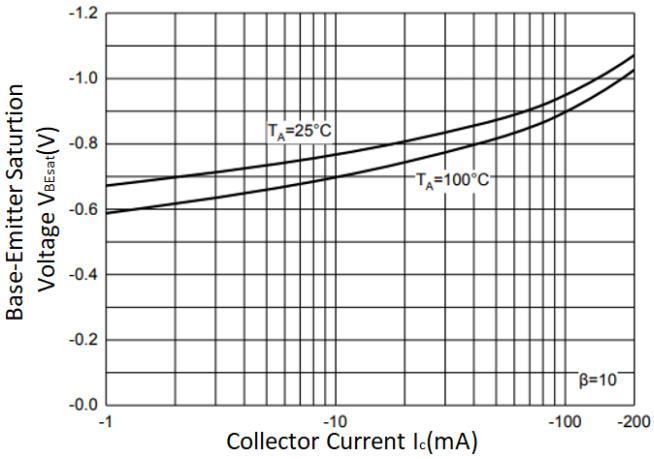


Figure 5. I_C vs. V_{BE}

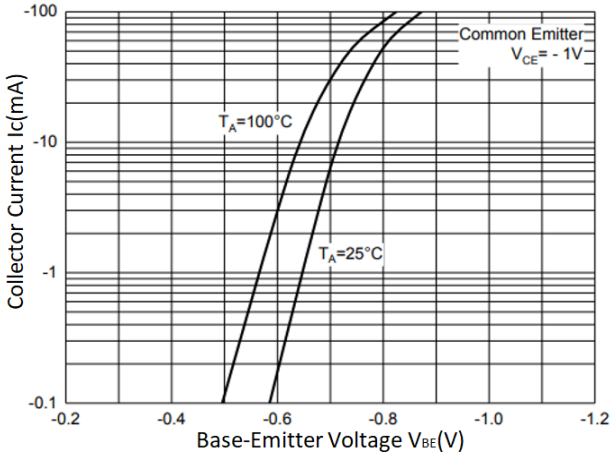
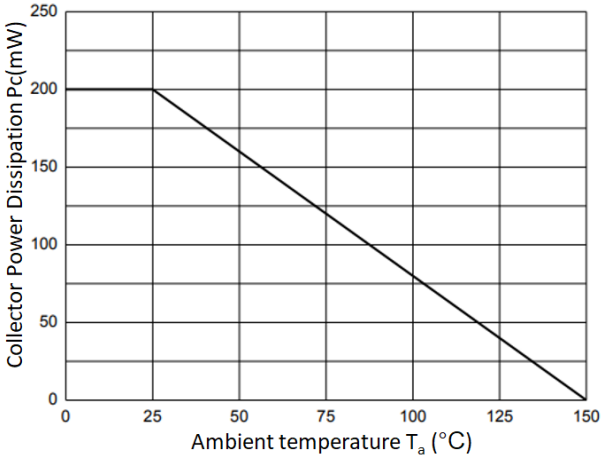
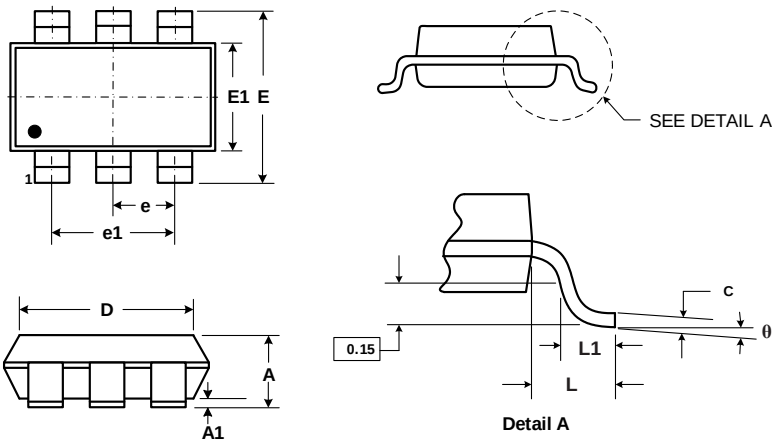


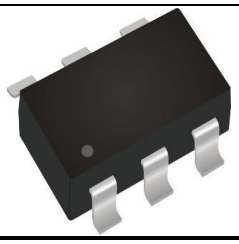
Figure 6. P_C vs. T_a



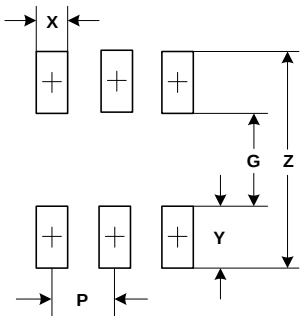
Outline Drawing – SOT-363-6L

PACKAGE OUTLINE





DIMENSIONS				
SYMBOL	INCHES		MILLIMETER	
	MIN	MAX	MIN	MAX
A	0.035	0.043	0.900	1.100
A1	0.000	0.004	0.000	0.100
D	0.079	0.087	2.000	2.200
E1	0.045	0.053	1.150	1.350
E	0.085	0.096	2.150	2.450
e	0.026 TYP		0.650 TYP	
e1	0.047	0.055	1.200	1.400
L	0.021 REF		0.525 REF	
L1	0.010	0.018	0.260	0.460
θ	0°	8°	0°	8°

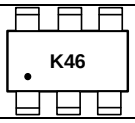


DIMENSIONS		
DIM	INCHES	MILLIMETERS
Z	0.090	2.30
G	0.073	1.85
P	0.020 TYP	0.65 TYP
X	0.008	0.20
Y	0.033	0.85

Notes

1. Dimensioning and tolerances per ANSI Y14.5M, 1985.
2. Controlling Dimension: Inches
3. Dimensions are exclusive of mold flash and metal burrs.

Marking Codes

Part Number	WT3946DW
Marking Code	

Package Information

Qty：3k/Reel

CONTACT INFORMATION

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