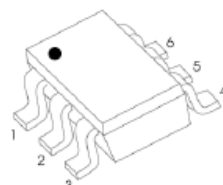
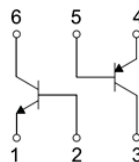


MAKING: K 46

FEATURES

Complementary Pair
One 3904-Type NPN
One 3906-Type PNP
Epitaxial Planar Die Construction
Ideal for Low Power Amplification and Switching



SOT-363

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

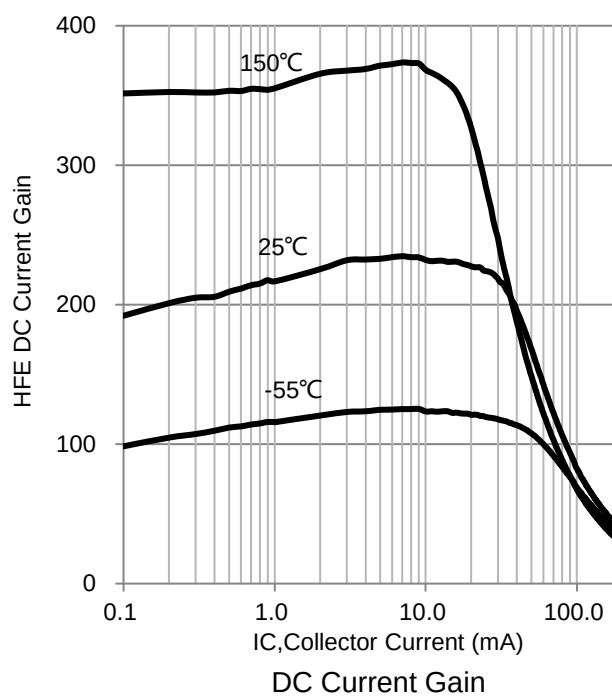
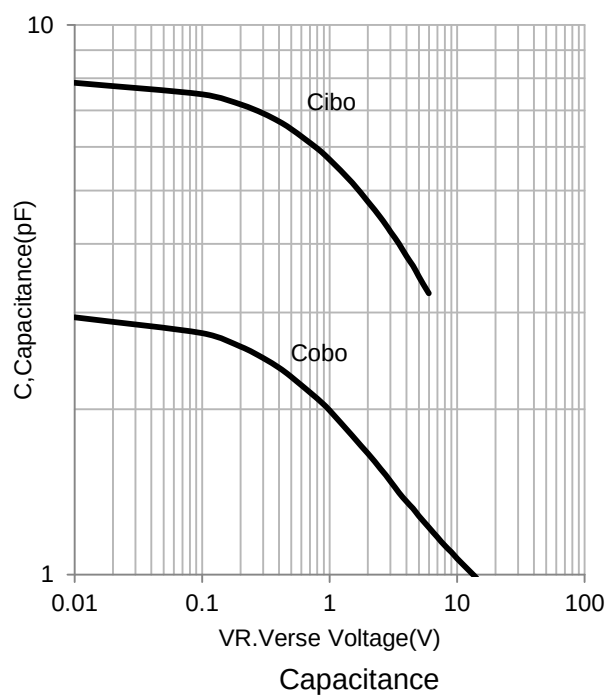
Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	5	V
I_C	Collector Current -Continuous	0.2	A
P_C	Collector Power Dissipation	0.2	W
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{stg}	Storage Temperature	-55-150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

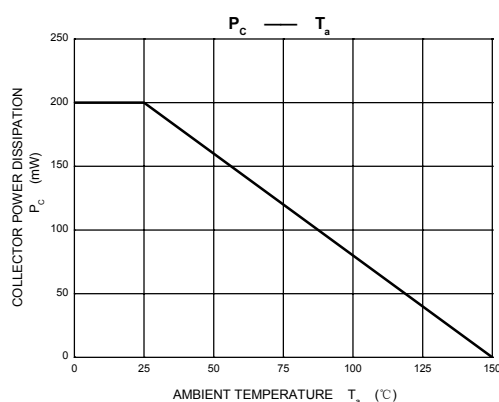
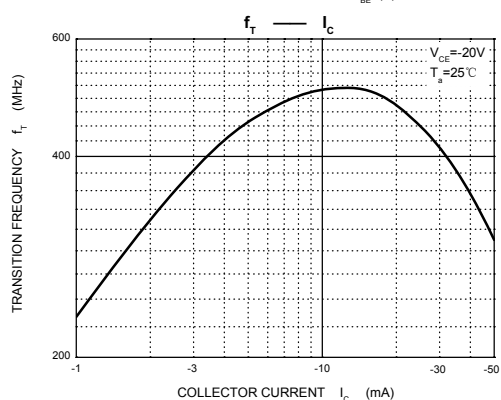
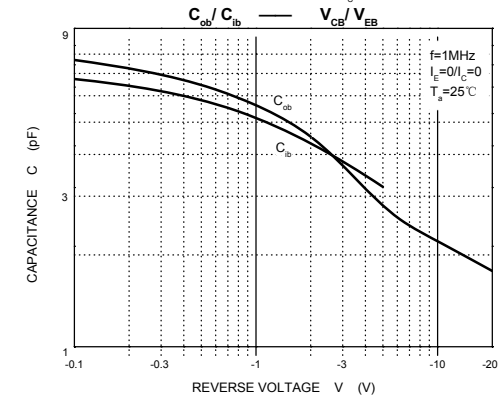
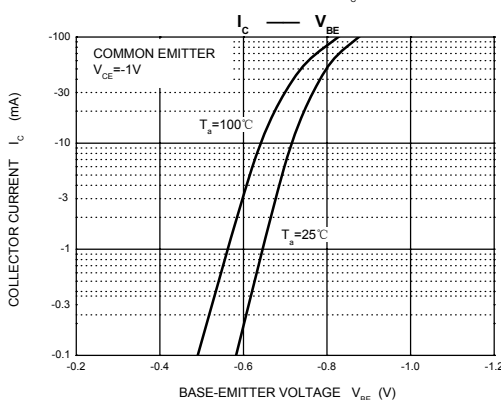
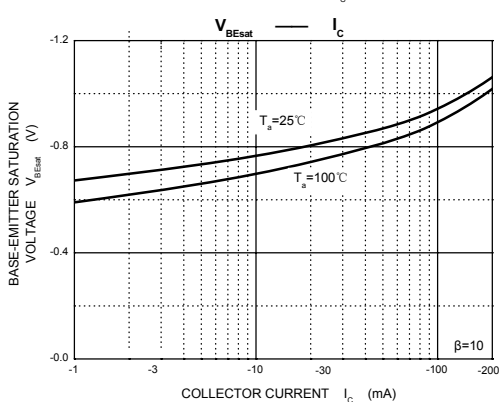
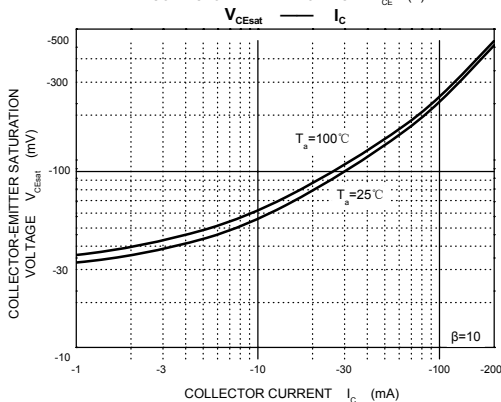
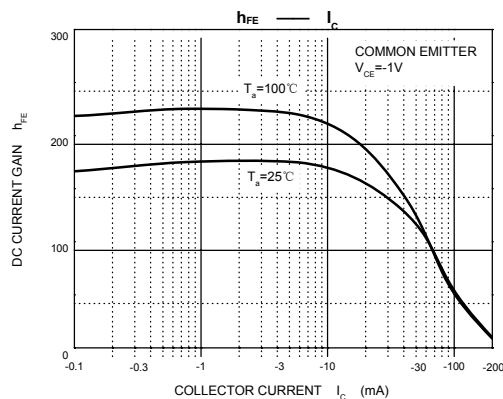
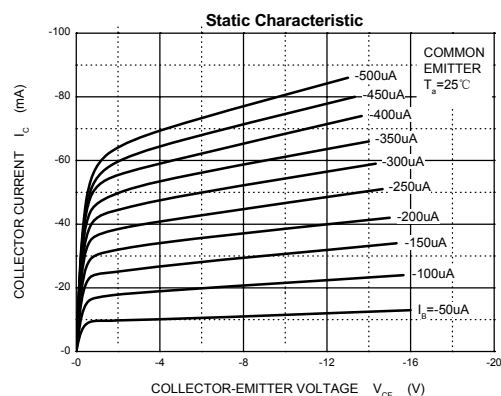
Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 10\mu A, I_E = 0$	60		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 1mA, I_B = 0$	40		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 10\mu A, I_C = 0$	5		V
Collector cut-off current	I_{CBO}	$V_{CB} = 30V, I_E = 0$		0.05	μA
Collector cut-off current	I_{CEO}	$V_{CE} = 30V, I_B = 0$		0.5	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 5V, I_C = 0$		0.05	μA
DC current gain	$h_{FE(1)}$	$V_{CE} = 1V, I_C = 1mA$	70	300	
	$h_{FE(2)}$	$V_{CE} = 1V, I_C = 10mA$	100		
	$h_{FE(3)}$	$V_{CE} = 1V, I_C = 50mA$	60		
	$h_{FE(4)}$	$V_{CE} = 1V, I_C = 100mA$	30		
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C = 10mA, I_B = 1mA$		0.2	V
	$V_{CE(sat)2}$	$I_C = 50mA, I_B = 5mA$		0.3	V
Base-emitter saturation voltage	$V_{BE(sat)1}$	$I_C = 10mA, I_B = 1mA$	0.65	0.85	V
	$V_{BE(sat)2}$	$I_C = 50mA, I_B = 5mA$		0.95	V
Transition frequency	f_T	$V_{CE} = 20V, I_C = 20mA, f = 100MHz$	300		MHz
Noise figure	NF	$V_{CE} = 5V, I_C = 0.1mA, f = 1KHz, R_g = 1K\Omega$		5	dB
Output capacitance	C_{ob}	$V_{CB} = 5V, I_E = 0, f = 1MHz$		4	pF
Delay time	t_d	$V_{CC} = 3V, V_{BE} = 0.5V$		35	nS
Rise time	t_r	$I_C = 10mA, I_{B1} = -I_{B2} = 1mA$		35	nS
Storage time	t_s	$V_{CC} = 3V, I_C = 10mA$		200	nS
Fall time	t_f	$I_{B1} = -I_{B2} = 1mA$		50	nS

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = -10\mu A, I_E = 0$	-40			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = -1mA, I_B = 0$	-40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = -10\mu A, I_C = 0$	-5			V
Collector cut-off current	I_{CBO}	$V_{CB} = -30V, I_E = 0$			-0.05	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = -5V, I_C = 0$			-0.05	μA
DC current gain	$h_{FE(1)}$	$V_{CE} = -1V, I_C = -1mA$	80		300	
	$h_{FE(2)}$	$V_{CE} = -1V, I_C = -10mA$	100			
	$h_{FE(3)}$	$V_{CE} = -1V, I_C = -50mA$	60			
	$h_{FE(4)}$	$V_{CE} = -1V, I_C = -100mA$	30			
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C = -10mA, I_B = -1mA$			-0.25	V
	$V_{CE(sat)2}$	$I_C = -50mA, I_B = -5mA$			-0.4	V
Base-emitter saturation voltage	$V_{BE(sat)1}$	$I_C = -10mA, I_B = -1mA$	-0.65		-0.85	V
	$V_{BE(sat)2}$	$I_C = -50mA, I_B = -5mA$			-0.95	V
Transition frequency	f_T	$V_{CE} = -20V, I_C = -10mA, f = 100MHz$	250			MHz
Collector output capacitance	C_{ob}	$V_{CB} = -5V, I_E = 0, f = 1MHz$			4.5	pF
Noise figure	NF	$V_{CE} = -5V, I_C = -0.1mA, f = 1KHz, R_g = 1K\Omega$			4	dB
Delay time	t_d	$V_{CC} = -3V, V_{BE} = -0.5V$			35	nS
Rise time	t_r	$I_C = -10mA, I_{B1} = -I_{B2} = -1mA$			35	nS
Storage time	t_s	$V_{CC} = -3V, I_C = -10mA$			225	nS
Fall time	t_f	$I_{B1} = -I_{B2} = -1mA$			75	nS

RATING AND CHARACTERISTIC CURVES

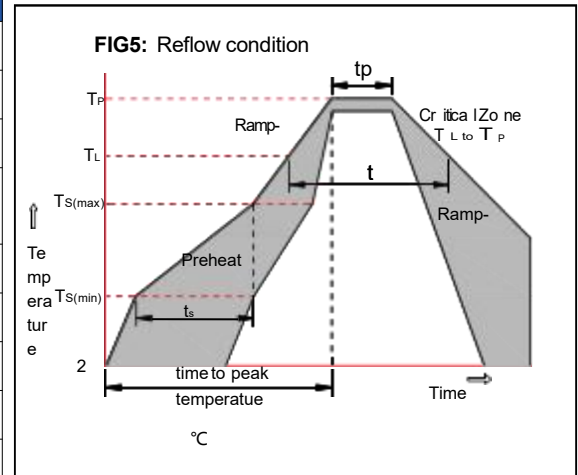


RATING AND CHARACTERISTIC CURVES



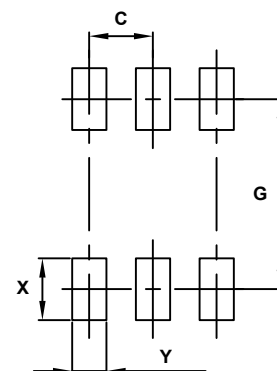
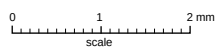
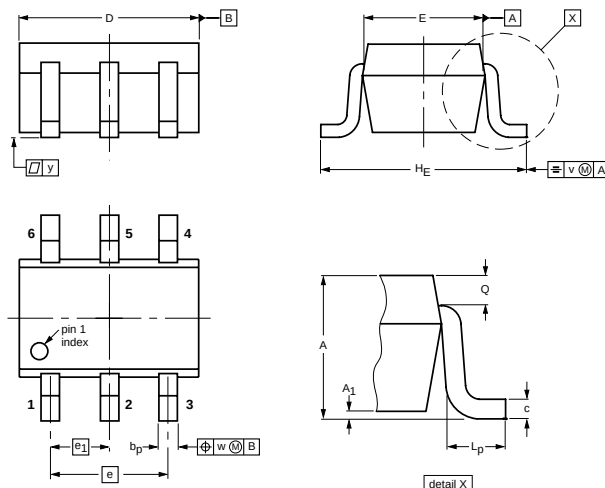
Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150 °C
	-Temperature Max($T_{s(max)}$)	+200 °C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3 °C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3 °C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217 °C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5) °C
Time within 5 °C of actual Peak Temp (t_P)		30 secs. Max
Ramp-down Rate		6 °C/sec. Max
Time 25 °C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260 °C



Package Dimensions & Suggested Pad Layout

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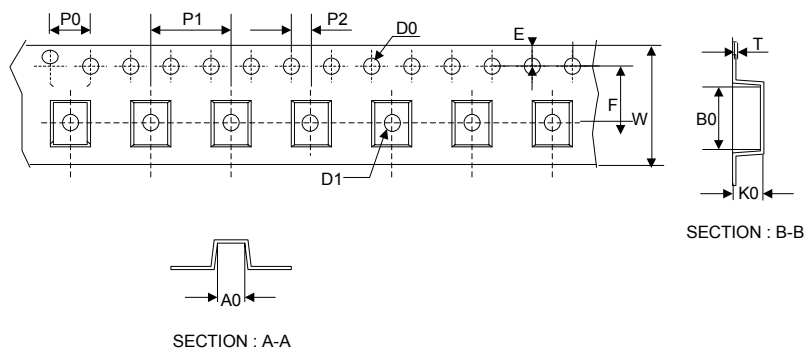
Dimensions	Value (in mm)
C	0.65
G	1.90
X	0.85
Y	0.40

DIMENSIONS (mm are the original dimensions)

UNIT	A	A ₁ max	bp	c	D	E	e	e ₁	HE	L _p	Q	v	w	y
mm	1.1 0.8	0.1	0.30 0.20	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.25 0.15	0.2	0.2	0.1

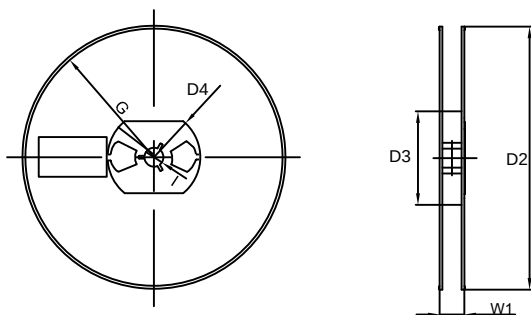
Tape & reel specification

Tape



Symbol	Dimension (mm)
P0	4.00±0.20
P1	4.00±0.20
P2	2.00±0.20
D0	1.55±0.20
D1	1.00±0.20
E	1.55±0.25
F	3.60±0.20
W	8.00±0.20
A0	3.00±0.20
B0	3.00±0.20
K0	1.30±0.20
T	0.20±0.20
D2	177.0±5.0
D3	55Min.
D4	R24.6±2.0
G	R82.0±2.0
I	13.0±2.0
W1	10.20±3.0

7" Reel



Quantity: 3000PCS