

Plastic-Encapsulate Transistors

DUAL TRANSISTOR (NPN+PNP)

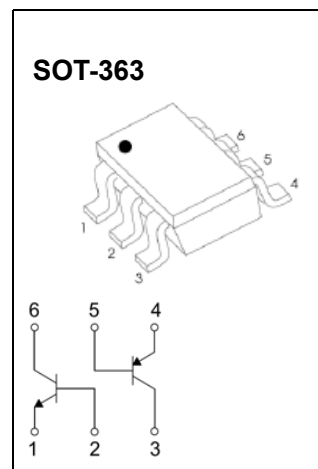
FEATURES

- Complementary Pair
- One 4401-Type NPN
One 4403-Type PNP
- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching

MAKING: K13

Maximum Ratings, NPN 4401 Section (Ta = 25°C unless otherwise specified)

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	60	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current -Continuous	0.6	A
P_C	Collector Power Dissipation	0.2	W
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	625	°C/W
T_J	Junction Temperature	150	°C
T_{stg}	Storage Temperature	-55 to +150	°C



NPN 4401 ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 100 \mu A, I_E = 0$	60		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 1 mA, I_B = 0$	40		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 100 \mu A, I_C = 0$	6		V
Collector cut-off current	I_{CBO}	$V_{CB} = 50 V, I_E = 0$		0.1	μA
Collector cut-off current	I_{CEO}	$V_{CE} = 35 V, I_B = 0$		0.5	μA
Emitter cut-off current	I_{EBO}	$V_{EB} = 5 V, I_C = 0$		0.1	μA
DC current gain	$h_{FE(1)}$	$V_{CE} = 1 V, I_C = 0.1 mA$	20		
	$h_{FE(2)}$	$V_{CE} = 1 V, I_C = 1 mA$	40		
	$h_{FE(3)}$	$V_{CE} = 1 V, I_C = 10 mA$	80		
	$h_{FE(4)}$	$V_{CE} = 1 V, I_C = 150 mA$	100	300	
	$h_{FE(5)}$	$V_{CE} = 2 V, I_C = 500 mA$	40		
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C = 150 mA, I_B = 15 mA$		0.4	V
	$V_{CE(sat)2}$	$I_C = 500 mA, I_B = 50 mA$		0.75	V
Base-emitter saturation voltage	$V_{BE(sat)1}$	$I_C = 150 mA, I_B = 15 mA$	0.75	0.95	V
	$V_{BE(sat)2}$	$I_C = 500 mA, I_B = 50 mA$		1.2	V
Transition frequency	f_T	$V_{CE} = 10 V, I_C = 20 mA, f = 100 MHz$	250		MHz
Output Capacitance	C_{ob}	$V_{CB} = 5 V, I_E = 0, f = 1 MHz$		6.5	pF
Delay time	t_d	$V_{CC} = 30 V, V_{BE} = 2.0 V, I_C = 150 mA, I_{B1} = 15 mA$		15	nS
Rise time	t_r			20	nS
Storage time	t_s			225	nS
Fall time	t_f			30	nS

Maximum Ratings, PNP 4403 Section (Ta = 25°C unless otherwise specified)

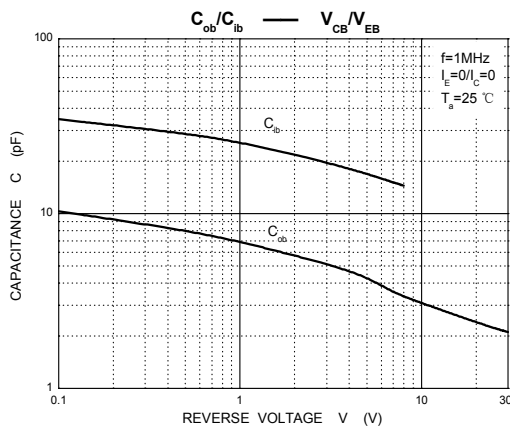
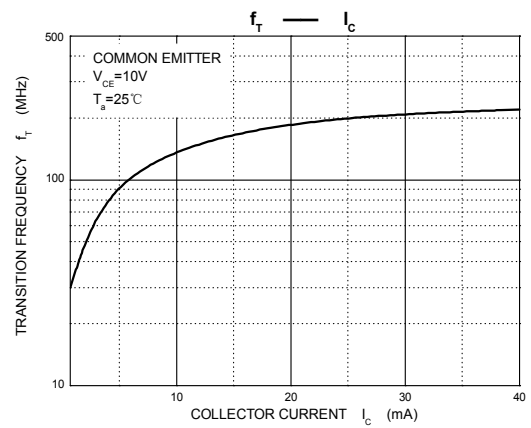
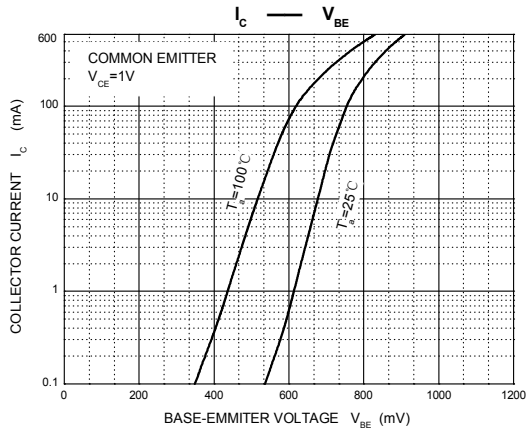
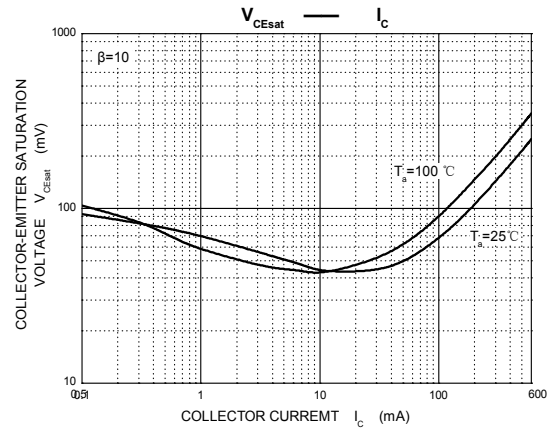
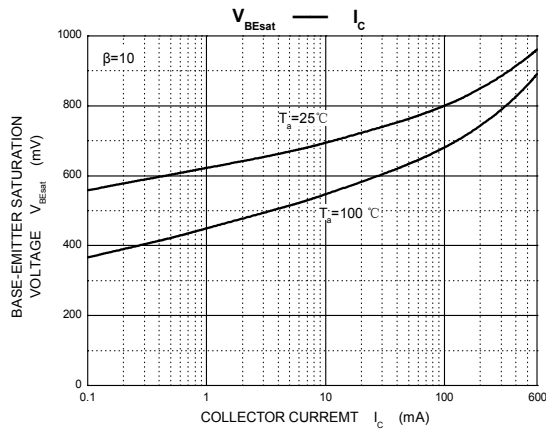
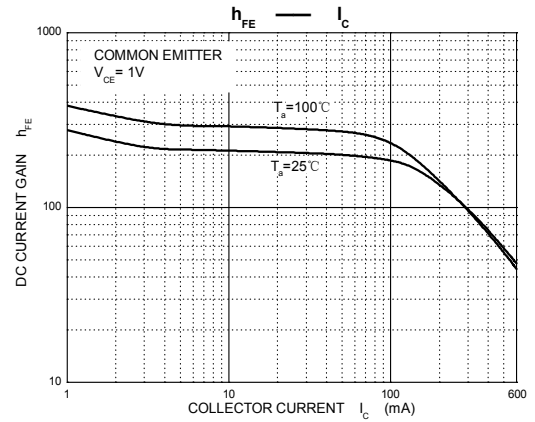
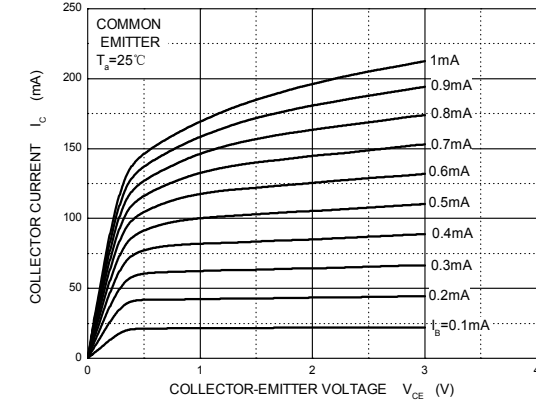
Symbol	Parameter	Value	Units
V _{CBO}	Collector-Base Voltage	-40	V
V _{CEO}	Collector-Emitter Voltage	-40	V
V _{EBO}	Emitter-Base Voltage	-5	V
I _C	Collector Current -Continuous	-0.6	A
P _C	Collector Power Dissipation	0.2	W
R _{θJA}	Thermal Resistance from Junction to Ambient	625	°C/W
T _J	Junction Temperature	150	°C
T _{stg}	Storage Temperature	-55 to +150	°C

PNP 4403 ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _C = -100μA, 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 = -100μA, I _C = 0	-5			V
Collector cut-off current	I _{CBO}	V _{CB} = -50 V, I _E = 0			-0.1	μA
Collector cut-off current	I _{CEO}	V _{CE} = -35 V, I _B = 0			-0.5	μA
Emitter cut-off current	I _{EBO}	V _{EB} = -5V, I _C = 0			-0.1	μA
DC current gain	h _{FE(1)}	V _{CE} = -1 V, I _C = -0.1mA	30			
	h _{FE(2)}	V _{CE} = -1 V, I _C = -1mA	60			
	h _{FE(3)}	V _{CE} = -1 V, I _C = -10mA	100			
	h _{FE(4)}	V _{CE} = -2 V, I _C = -150mA	100		300	
	h _{FE(5)}	V _{CE} = -2 V, I _C = -500mA	20			
Collector-emitter saturation voltage	V _{CE(sat)1}	I _C = -150 mA, I _B = -15mA			-0.4	V
	V _{CE(sat)2}	I _C = -500 mA, I _B = -50mA			-0.75	V
Base-emitter saturation voltage	V _{BE(sat)1}	I _C = -150 mA, I _B = -15mA	-0.75		-0.95	V
	V _{BE(sat)2}	I _C = -500 mA, I _B = -50mA			-1.3	V
Transition frequency	f _T	V _{CE} = -10V, I _C = -20mA f = 100MHz	200			MHz
Output Capacitance	C _{ob}	V _{CB} = -10V, I _E = 0 f = 1MHz			8.5	pF
Delay time	t _d	V _{CC} = -30V, V _{BE} = -2V			15	nS
Rise time	t _r	I _C = -150mA, I _{B1} = -15mA			20	nS
Storage time	t _s	V _{CC} = -30V, I _C = -150mA			225	nS
Fall time	t _f	I _{B1} = -I _{B2} = -15mA			30	nS

NPN Transistor

Static Characteristic



PNP Transistor

