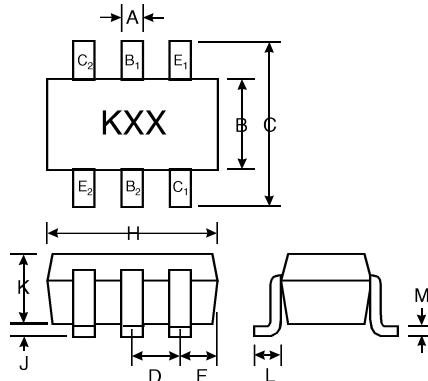


### Features

Complementary Pair  
Epitaxial Planar Die Construction  
Ultra-Small Surface Mount Package  
One 2222A-Type NPN,  
One 2907A-Type PNP  
Ideal for Low Power Amplification and  
Switching

### Mechanical Data

Case: SOT-363, Molded Plastic  
Terminals: Solderable per MIL-STD-202,  
Method 208  
Terminal Connections: See Diagram  
Marking: K27  
Weight: 0.006 grams (approx.)



SOT-363		
Dim	Min	Max
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
F	0.30	0.40
H	1.80	2.20
J		0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.25
All Dimensions in mm		

Note: E1, B1, and C1 = PNP2907A Section,  
E2, B2, and C2 = NPN2222A Section.  
Type marking indicates orientation.

### Maximum Ratings, NPN2222A Section

@  $T_A = 25\text{ C}$  unless otherwise specified

Characteristic	Symbol	NPN2222A	Unit
Collector-Base Voltage	$V_{CBO}$	75	V
Collector-Emitter Voltage	$V_{CEO}$	40	V
Emitter-Base Voltage	$V_{EBO}$	6.0	V
Collector Current - Continuous (Note 1)	$I_C$	600	mA
Power Dissipation (Note 1)	$P_d$	200	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{JA}$	625	K/W
Operating and Storage and Temperature Range	$T_J, T_{STG}$	-55 to +150	C

### Maximum Ratings, PNP2907A Section

@  $T_A = 25\text{ C}$  unless otherwise specified

Characteristic	Symbol	PNP2907A	Unit
Collector-Base Voltage	$V_{CBO}$	-60	V
Collector-Emitter Voltage	$V_{CEO}$	-60	V
Emitter-Base Voltage	$V_{EBO}$	-5.0	V
Collector Current - Continuous (Note 1)	$I_C$	-600	mA
Power Dissipation (Note 1)	$P_d$	200	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{JA}$	625	K/W
Operating and Storage and Temperature Range	$T_J, T_{STG}$	-55 to +150	C

Note: 1. Valid provided that terminals are kept at ambient temperature.  
2. Pulse test: Pulse width 300  $\mu$ s, duty cycle 2%.

**Electrical Characteristics, NPN2222A Section**

 @ T<sub>A</sub> = 25 C unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 2)</b>					
Collector-Base Breakdown Voltage	V <sub>(BR)CBO</sub>	75		V	I <sub>C</sub> = 10 A, I <sub>E</sub> = 0
Collector-Emitter Breakdown Voltage	V <sub>(BR)CEO</sub>	40		V	I <sub>C</sub> = 10mA, I <sub>B</sub> = 0
Emitter-Base Breakdown Voltage	V <sub>(BR)EBO</sub>	6.0		V	I <sub>E</sub> = 10 A, I <sub>C</sub> = 0
Collector Cutoff Current	I <sub>CB0</sub>		10	nA A	V <sub>CB</sub> = 60V, I <sub>E</sub> = 0 V <sub>CB</sub> = 60V, I <sub>E</sub> = 0, T <sub>A</sub> = 150 C
Collector Cutoff Current	I <sub>CEx</sub>		10	nA	V <sub>CE</sub> = 60V, V <sub>EB(OFF)</sub> = 3.0V
Emitter Cutoff Current	I <sub>EBO</sub>		10	nA	V <sub>EB</sub> = 3.0V, I <sub>C</sub> = 0
Base Cutoff Current	I <sub>BL</sub>		20	nA	V <sub>CE</sub> = 60V, V <sub>EB(OFF)</sub> = 3.0V
<b>ON CHARACTERISTICS (Note 2)</b>					
DC Current Gain	h <sub>FE</sub>	35 50 75 100 40 50 35	300		I <sub>C</sub> = 100 A, V <sub>CE</sub> = 10V I <sub>C</sub> = 1.0mA, V <sub>CE</sub> = 10V I <sub>C</sub> = 10mA, V <sub>CE</sub> = 10V I <sub>C</sub> = 150mA, V <sub>CE</sub> = 10V I <sub>C</sub> = 500mA, V <sub>CE</sub> = 10V I <sub>C</sub> = 10mA, V <sub>CE</sub> = 10V, T <sub>A</sub> = -55 C I <sub>C</sub> = 150mA, V <sub>CE</sub> = 1.0V
Collector-Emitter Saturation Voltage	V <sub>CE(SAT)</sub>		0.3 1.0	V	I <sub>C</sub> = 150mA, I <sub>B</sub> = 15mA I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA
Base- Emitter Saturation Voltage	V <sub>BE(SAT)</sub>	0.6	1.2 2.0	V	I <sub>C</sub> = 150mA, I <sub>B</sub> = 15mA I <sub>C</sub> = 500mA, I <sub>B</sub> = 50mA
<b>SMALL SIGNAL CHARACTERISTICS</b>					
Output Capacitance	C <sub>obo</sub>		8	pF	V <sub>CB</sub> = 10V, f = 1.0MHz, I <sub>E</sub> = 0
Input Capacitance	C <sub>ibo</sub>	—	25	pF	V <sub>EB</sub> = 0.5V, f = 1.0MHz, I <sub>C</sub> = 0
Current Gain-Bandwidth Product	f <sub>T</sub>	300		MHz	V <sub>CE</sub> = 20V, I <sub>C</sub> = 20mA, f = 100MHz
Noise Figure	NF		4.0	dB	V <sub>CE</sub> = 10V, I <sub>C</sub> = 100 A, R <sub>S</sub> = 1.0k f = 1.0kHz
<b>SWITCHING CHARACTERISTICS</b>					
Delay Time	t <sub>d</sub>		10	ns	V <sub>CC</sub> = 30V, I <sub>C</sub> = 150mA, V <sub>BE(off)</sub> = - 0.5V, I <sub>B1</sub> = 15mA
Rise Time	t <sub>r</sub>		25	ns	

- Note: 1. Valid provided that terminals are kept at ambient temperature.  
2. Pulse test: Pulse width 300 s, duty cycle 2%.

# Electrical Characteristics, PNP2907A Section

@  $T_A = 25\text{ C}$  unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 2)</b>					
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-60		V	$I_C = -10\text{ A}, I_E = 0$
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-60		V	$I_C = -10\text{mA}, I_B = 0$
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5.0		V	$I_E = -10\text{ A}, I_C = 0$
Collector Cutoff Current	$I_{CBO}$		-10	nA A	$V_{CB} = -50\text{V}, I_E = 0$ $V_{CB} = -50\text{V}, I_E = 0, T_A = 125\text{ C}$
Collector Cutoff Current	$I_{CEX}$		-50	nA	$V_{CE} = -30\text{V}, V_{EB(OFF)} = -0.5\text{V}$
Base Cutoff Current	$I_{BL}$		-50	nA	$V_{CE} = -30\text{V}, V_{EB(OFF)} = -0.5\text{V}$
<b>ON CHARACTERISTICS (Note 2)</b>					
DC Current Gain	$h_{FE}$	75 100 100 100 50	300		$I_C = -100\mu\text{A}, V_{CE} = -10\text{V}$ $I_C = -1.0\text{mA}, V_{CE} = -10\text{V}$ $I_C = -10\text{mA}, V_{CE} = -10\text{V}$ $I_C = -150\text{mA}, V_{CE} = -10\text{V}$ $I_C = -500\text{mA}, V_{CE} = -10\text{V}$
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$		-0.4 -1.6	V	$I_C = -150\text{mA}, I_B = -15\text{mA}$ $I_C = -500\text{mA}, I_B = -50\text{mA}$
Base- Emitter Saturation Voltage	$V_{BE(SAT)}$		-1.3 -2.6	V	$I_C = 150\text{mA}, I_B = 15\text{mA}$ $I_C = 500\text{mA}, I_B = 50\text{mA}$
<b>SMALL SIGNAL CHARACTERISTICS</b>					
Output Capacitance	$C_{obo}$		8.0	pF	$V_{CB} = -10\text{V}, f = 1.0\text{MHz}, I_E = 0$
Input Capacitance	$C_{ibo}$	—	30	pF	$V_{EB} = -2.0\text{V}, f = 1.0\text{MHz}, I_C = 0$
Current Gain-Bandwidth Product	$f_T$	200		MHz	$V_{CE} = -20\text{V}, I_C = -50\text{mA}, f = 100\text{MHz}$
<b>SWITCHING CHARACTERISTICS</b>					
Turn-On Time	$t_{on}$		45	ns	$I_C = -150\text{mA}, V_{CC} = -30\text{V}, I_{B1} = -15\text{mA}$
Delay Time	$t_d$		10	ns	$V_{CC} = -30\text{V}, I_C = -150\text{mA}, I_{B1} = -15\text{mA}$
Rise Time	$t_r$		40	ns	

- Notes: 1. Valid provided that terminals are kept at ambient temperature.  
2. Pulse test: Pulse width 300 s, duty cycle 2%.