MMDT5451

COMPLEMENTARY NPN / PNP SMALL SIGNAL SURFACE MOUNT TRANSISTOR

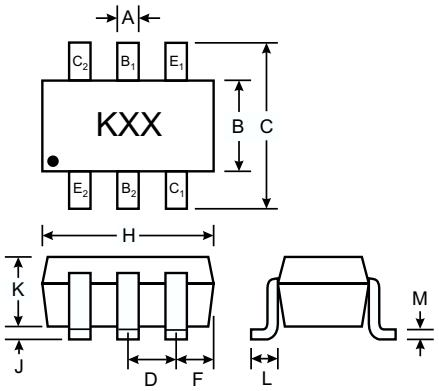
NEW PRODUCT

Features

- Complementary Pair
- One 5551-Type NPN, One 5401-Type PNP
- Epitaxial Planar Die Construction
- Ideal for Medium Power Amplification and Switching
- Ultra-Small Surface Mount Package

Mechanical Data

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



E_1, B_1, C_1 = PNP5401 Section
E_2, B_2, C_2 = NPN5551 Section

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		

Maximum Ratings, NPN 5551 Section

@ T_A = 25°C unless otherwise specified

Characteristic	Symbol	NPN5551	Unit
Collector-Base Voltage	V_{CBO}	180	V
Collector-Emitter Voltage	V_{CEO}	160	V
Emitter-Base Voltage	V_{EBO}	6.0	V
Collector Current - Continuous (Note 1)	I_C	200	mA
Power Dissipation (Note 1, 2)	P_d	200	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	625	K/W
Operating and Storage and Temperature Range	T_j, T_{STG}	-55 to +150	°C

Maximum Ratings, PNP 5401 Section

@ T_A = 25°C unless otherwise specified

Characteristic	Symbol	PNP5401	Unit
Collector-Base Voltage	V_{CBO}	-160	V
Collector-Emitter Voltage	V_{CEO}	-150	V
Emitter-Base Voltage	V_{EBO}	-5.0	V
Collector Current - Continuous (Note 1)	I_C	-200	mA
Power Dissipation (Note 1, 2)	P_d	200	mW
Thermal Resistance, Junction to Ambient (Note 1)	$R_{\theta JA}$	625	K/W
Operating and Storage and Temperature Range	T_j, T_{STG}	-55 to +150	°C

Notes: 1. Valid provided that terminals are kept at ambient temperature.
2. Maximum combined dissipation.

NEW PRODUCT

Electrical Characteristics, NPN 5551 Section

@ T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 3)					
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	180	—	V	I_C = 100μA, I_E = 0
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	160	—	V	I_C = 1.0mA, I_B = 0
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	6.0	—	V	I_E = 10μA, I_C = 0
Collector Cutoff Current	I_{CBO}	—	50	nA μA	V_{CB} = 120V, I_E = 0 V_{CB} = 120V, I_E = 0, T_A = 100°C
Emitter Cutoff Current	I_{EBO}	—	50	nA	V_{EB} = 4.0V, I_C = 0
ON CHARACTERISTICS (Note 3)					
DC Current Gain	h_{FE}	80 80 30	— 250 —	—	I_C = 1.0mA, V_{CE} = 5.0V I_C = 10mA, V_{CE} = 5.0V I_C = 50mA, V_{CE} = 5.0V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	0.15 0.20	V	I_C = 10mA, I_B = 1.0mA I_C = 50mA, I_B = 5.0mA
Base- Emitter Saturation Voltage	$V_{BE(SAT)}$	—	1.0	V	I_C = 10mA, I_B = 1.0mA I_C = 50mA, I_B = 5.0mA
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C_{obo}	—	6.0	pF	V_{CB} = 10V, f = 1.0MHz, I_E = 0
Small Signal Current Gain	h_{fe}	50	250	—	V_{CE} = 10V, I_C = 1.0mA, f = 1.0kHz
Current Gain-Bandwidth Product	f_T	100	300	MHz	V_{CE} = 10V, I_C = 10mA, f = 100MHz
Noise Figure	NF	—	8.0	dB	V_{CE} = 5.0V, I_C = 200μA, R_S = 1.0kΩ, f = 1.0kHz

Electrical Characteristics, PNP 5401 Section

@ T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 3)					
Collector-Base Breakdown Voltage	$V_{(BR)CBO}$	-160	—	V	I_C = -100μA, I_E = 0
Collector-Emitter Breakdown Voltage	$V_{(BR)CEO}$	-150	—	V	I_C = -1.0mA, I_B = 0
Emitter-Base Breakdown Voltage	$V_{(BR)EBO}$	-5.0	—	V	I_E = -10μA, I_C = 0
Collector Cutoff Current	I_{CBO}	—	-50	nA μA	V_{CB} = -120V, I_E = 0 V_{CB} = -120V, I_E = 0, T_A = 100°C
Emitter Cutoff Current	I_{EBO}	—	-50	nA	V_{EB} = -3.0V, I_C = 0
ON CHARACTERISTICS (Note 3)					
DC Current Gain	h_{FE}	50 60 50	— 240 —	—	I_C = -1.0mA, V_{CE} = -5.0V I_C = -10mA, V_{CE} = -5.0V I_C = -50mA, V_{CE} = -5.0V
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	—	-0.2 -0.5	V	I_C = -10mA, I_B = -1.0mA I_C = -50mA, I_B = -5.0mA
Base- Emitter Saturation Voltage	$V_{BE(SAT)}$	—	-1.0	V	I_C = -10mA, I_B = -1.0mA I_C = -50mA, I_B = -5.0mA
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C_{obo}	—	6.0	pF	V_{CB} = -10V, f = 1.0MHz, I_E = 0
Small Signal Current Gain	h_{fe}	40	200	—	V_{CE} = -10V, I_C = -1.0mA, f = 1.0kHz
Current Gain-Bandwidth Product	f_T	100	300	MHz	V_{CE} = -10V, I_C = -10mA, f = 100MHz
Noise Figure	NF	—	8.0	dB	V_{CE} = -5.0V, I_C = -200μA, R_S = 10Ω, f = 1.0kHz

Notes: 3. Pulse test: Pulse width ≤ 300μs, duty cycle ≤ 2%.