

SOT-363 Plastic-Encapsulate Transistors

MMDT2227DW

DUAL TRANSISTOR (NPN+PNP)

FEATURE

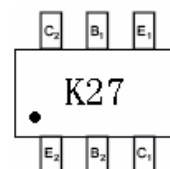
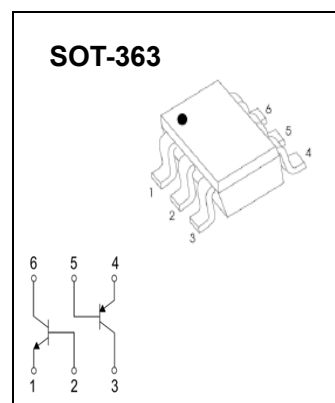
- Epitaxial planar die construction
- One 2222A NPN
One 2907A PNP
- Ideal for power amplification and switching

MARKING: K27

NPN 2222A

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

Symbol	Parameter	Value	Units
V_{CB0}	Collector-Base Voltage	75	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current -Continuous	600	mA
P_C	Collector Power Dissipation	200	mW
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{stg}	Storage Temperature	-55-150	$^\circ\text{C}$



ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=10\mu\text{A}, I_E=0$	75		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=10\text{mA}, I_B=0$	40		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=10\mu\text{A}, I_C=0$	6		V
Collector cut-off current	I_{CBO}	$V_{CB}=60\text{V}, I_E=0$		10	nA
Collector cut-off current	I_{CEX}	$V_{CE}=60\text{V}, V_{EB(off)}=3\text{V}$		10	nA
Emitter cut-off current	I_{EBO}	$V_{EB}=3\text{V}, I_C=0$		10	nA
DC current gain	$h_{FE(1)}^*$	$V_{CE}=10\text{V}, I_C=0.1\text{mA}$	35		
	$h_{FE(2)}^*$	$V_{CE}=10\text{V}, I_C=1\text{mA}$	50		
	$h_{FE(3)}^*$	$V_{CE}=10\text{V}, I_C=10\text{mA}$	75		
	$h_{FE(4)}^*$	$V_{CE}=10\text{V}, I_C=150\text{mA}$	100	300	
	$h_{FE(5)}^*$	$V_{CE}=10\text{V}, I_C=500\text{mA}$	40		
	$h_{FE(6)}^*$	$V_{CE}=1\text{V}, I_C=150\text{mA}$	35		
Collector-emitter saturation voltage	$V_{CE(sat)1}^*$	$I_C=150\text{mA}, I_B=15\text{mA}$		0.3	V
	$V_{CE(sat)2}^*$	$I_C=500\text{mA}, I_B=50\text{mA}$		1	V
Base-emitter saturation voltage	$V_{BE(sat)1}^*$	$I_C=150\text{mA}, I_B=15\text{mA}$	0.6	1.2	V
	$V_{BE(sat)2}^*$	$I_C=500\text{mA}, I_B=50\text{mA}$		2	V
Transition frequency	f_T	$V_{CE}=20\text{V}, I_C=20\text{mA}, f=100\text{MHz}$	300		MHz
Output Capacitance	C_{ob}	$V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$		8	pF
Input Capacitance	C_{ib}	$V_{EB}=0.5\text{V}, I_C=0, f=1\text{MHz}$		25	pF
Noise Figure	NF	$V_{CE}=10\text{V}, I_C=100\mu\text{A}, f=1\text{KHz}, R_s=1\text{K}\Omega$		4	dB

*pulse test

Switching characteristics

Parameter	Symbol	Test conditions	Min	Max	Unit
Delay time	t_d	$V_{CC}=30V, I_C=150mA,$ $V_{BE(off)}=0.5V, I_{B1}=15mA$		10	ns
Rise time	t_r			25	ns
Storage time	t_s			225	ns
Fall time	t_f			60	ns

PNP 2907A

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

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	-60	V
V_{CEO}	Collector-Emitter Voltage	-60	V
V_{EBO}	Emitter-Base Voltage	-5	V
I_C	Collector Current -Continuous	-600	mA
P_C	Collector Power Dissipation	200	mW
T_J	Junction Temperature	150	$^\circ C$
T_{stg}	Storage Temperature	-55-150	$^\circ C$

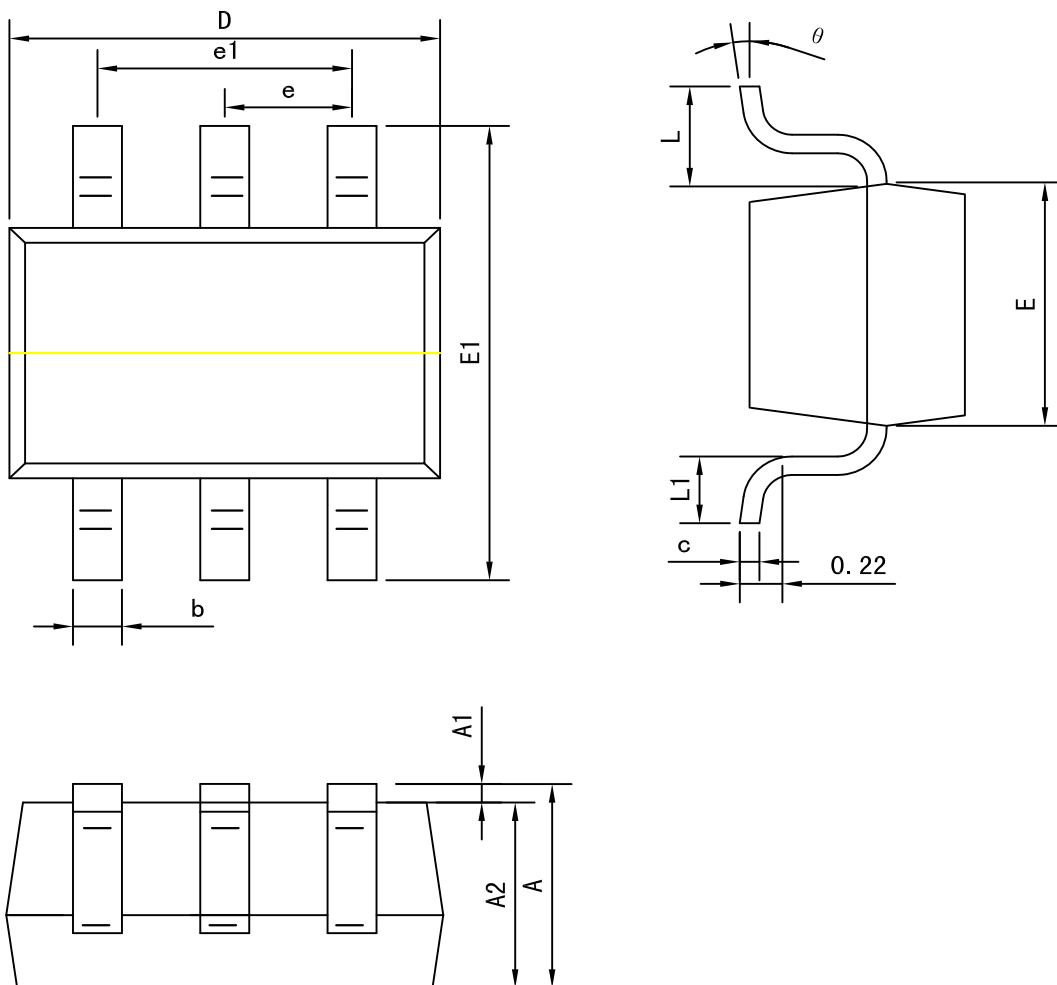
ELECTRICAL CHARACTERISTICS ($T_a=25^\circ C$ unless otherwise specified)

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	$V_{(BR)CEO}$	$I_C = -10mA, I_B = 0$	-60		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = -10\mu A, I_C = 0$	-5		V
Collector cut-off current	I_{CBO}	$V_{CB} = -50V, I_E = 0$		-10	nA
Collector cut-off current	I_{CEX}	$V_{CE} = -30V, V_{EB(off)} = -0.5V$		-50	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = -3V, I_C = 0$		-10	nA
DC current gain	$h_{FE(1)}^*$	$V_{CE} = -10V, I_C = -0.1mA$	75		
	$h_{FE(2)}^*$	$V_{CE} = -10V, I_C = -1mA$	100		
	$h_{FE(3)}^*$	$V_{CE} = -10V, I_C = -10mA$	100		
	$h_{FE(4)}^*$	$V_{CE} = -10V, I_C = -150mA$	100	300	
	$h_{FE(5)}^*$	$V_{CE} = -10V, I_C = -500mA$	50		
Collector-emitter saturation voltage	$V_{CE(sat)1}^*$	$I_C = -150mA, I_B = -15mA$		-0.4	V
	$V_{CE(sat)2}^*$	$I_C = -500mA, I_B = -50mA$		-1.6	V
Base-emitter saturation voltage	$V_{BE(sat)1}^*$	$I_C = -150mA, I_B = -15mA$		-1.3	V
	$V_{BE(sat)2}^*$	$I_C = -500mA, I_B = -50mA$		-2.6	V
Transition frequency	f_T	$V_{CE} = -20V, I_C = -50mA, f = 100MHz$	200		MHz
Output Capacitance	C_{ob}	$V_{CB} = -10V, I_E = 0, f = 1MHz$		8	pF
Input Capacitance	C_{ib}	$V_{EB} = -2V, I_C = 0, f = 1MHz$		30	pF
Delay time	t_d	$V_{CC} = -30V, I_C = -150mA, I_{B1} = -15mA$		10	ns
Rise time	t_r			40	ns
Storage time	t_s			225	ns
Fall time	t_f			60	ns

*pulse test

Package outline dimensions

SOT-363



Symbol	Dimension in Millimeters	
	Min	Max
A	0.900	1.100
A1	0.000	0.100
A2	0.900	1.000
b	0.150	0.350
c	0.080	0.150
D	2.000	2.200
E	1.150	1.350
E1	2.150	2.450
e	0.650 TYP	
e1	1.200	1.400
L	0.525 REF	
L1	0.260	0.460
θ	0°	8°