



SOT-363 Plastic-Encapsulate Transistors

MMDT2227 TRANSISTOR (NPN+PNP)

FEATURE

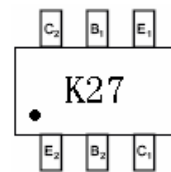
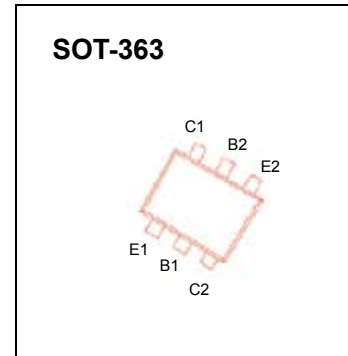
- Epitaxial planar die construction
- One 2222A NPN
One 2907A PNP
- Ideal for power amplification and switching

MARKING: K27

NPN 2222A

MAXIMUM RATINGS (T_a=25°C unless otherwise noted)

Symbol	Parameter	Value	Units
V _{CBO}	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	°C
T _{stg}	Storage Temperature	-55-150	°C



E2 B2 C2 NPN
E1 B1 C1 PNP

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

Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	V _{(BR)CBO}	I _C = 10μA, I _E =0	75		V
Collector-emitter breakdown voltage	V _{(BR)CEO}	I _C = 10mA, I _B =0	40		V
Emitter-base breakdown voltage	V _{(BR)EBO}	I _E =10μA, I _C =0	6		V
Collector cut-off current	I _{CBO}	V _{CB} = 60V, I _E =0		10	nA
Collector cut-off current	I _{CEX}	V _{CE} = 60V, V _{EB(off)} =3V		10	nA
Emitter cut-off current	I _{EBO}	V _{EB} = 3 V, I _C =0		10	nA
DC current gain	h _{FE(1)} *	V _{CE} =10V, I _C = 0.1mA	35		
	h _{FE(2)} *	V _{CE} =10V, I _C = 1mA	50		
	h _{FE(3)} *	V _{CE} =10V, I _C = 10mA	75		
	h _{FE(4)} *	V _{CE} =10V, I _C = 150mA	100	300	
	h _{FE(5)} *	V _{CE} =10V, I _C = 500mA	40		
	h _{FE(6)} *	V _{CE} =1V, I _C = 150mA	35		
Collector-emitter saturation voltage	V _{CE(sat)1} *	I _C =150mA, I _B = 15mA		0.3	V
	V _{CE(sat)2} *	I _C =500mA, I _B = 50mA		1	V
Base-emitter saturation voltage	V _{BE(sat)1} *	I _C =150mA, I _B =15mA	0.6	1.2	V
	V _{BE(sat)2} *	I _C =500mA, I _B = 50mA		2	V
Transition frequency	f _T	V _{CE} =20V, I _C = 20mA, f=100MHz	300		MHz
Output Capacitance	C _{ob}	V _{CB} =10V, I _E =0, f=1MHz		8	pF
Input Capacitance	C _{ib}	V _{EB} =0.5V, I _C = 0, f=1MHz		25	pF
Noise Figure	NF	V _{CE} =10V, I _C =100μA, f=1KHz, R _s =1KΩ		4	dB

E_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

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