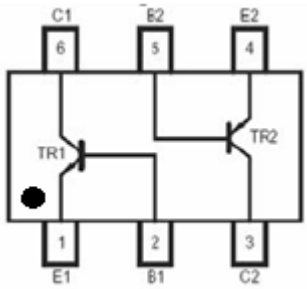
MMDT2227

Dual Bipolar Transistor(NPN+PNP)

FEATURES

- Epitaxial planar die construction.
- Complementary Pair.
- Ultra-small surface mount package.
- One 2222A-Type NPN,
  One 2907A-Type PNP.



SOT-363

APPLICATIONS

- Ideal for low power amplification and switching .

ORDERING INFORMATION

Type No.	Marking	Package Code
MMDT2227	K27	SOT-363

MAXIMUM RATING ,NPN 2222A Section @ Ta=25℃ unless otherwise specified

Symbol	Parameter	Value	Unit
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_D	Power Dissipation	200	mW
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	625	℃/W
T_j, T_{stg}	Junction and Storage Temperature	-55 to +150	℃

MAXIMUM RATING ,PNP 2907A Section @ Ta=25℃ unless otherwise specified

Symbol	Parameter	Value	Unit
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_D	Power Dissipation	200	mW
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	625	℃/W
T_j, T_{stg}	Junction and Storage Temperature	-55 to +150	℃

ELECTRICAL CHARACTERISTICS OF TR2 , NPN2222A SECTION

@ Ta=25℃ 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 V_{CB}=60V,I_E=0,T_A=150℃	-	10 10	nA μA
Collector cut-off current	I_{CEX}	V_{CE}=60V, $V_{EB(OFF)}$=3.0V	-	10	nA
Emitter cut-off current	I_{EBO}	V_{EB}=3V I_C=0	-	10	nA
Base cut-off current	I_{BL}	V_{CE}=60V $V_{EB(OFF)}$=3.0V	-	20	nA
DC current gain	h_{FE}	V_{CE}=10V,I_C=100μA V_{CE}=10V,I_C=1.00mA V_{CE}=10V,I_C=10mA V_{CE}=10V,I_C=150mA V_{CE}=10V,I_C=500mA V_{CE}=10V,I_C=10mA,T_A=-55℃ V_{CE}=1.0V,I_C=150mA,	35 50 75 100 40 50 35	- - - 300 - - -	
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=150mA I_B=15mA I_C=500mA I_B=50mA	-	0.3 1.0	V
Base-emitter saturation voltage	$V_{BE(sat)}$	I_C=150mA I_B=15mA I_C=500mA I_B=50mA	0.6 -	1.2 2.0	V
Transition frequency	f_T	V_{CE}=20V,I_C=20mA ,f=100MHz	300	-	MHz
Output Capacitance	C_{obo}	V_{CB}=10V,f=1.0MHz,I_E=0	-	8	pF
Input Capacitance	C_{ibo}	V_{EB}=0.5V,f=1.0MHz,I_C=0	-	25	pF
Noise Figure	NF	V_{CE}=10V,f=1.0kHz,I_C=0.1mA R_g=1.0KΩ,	-	4.0	dB
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

ELECTRICAL CHARACTERISTICS OF TR2, PNP2907A SECTION

@ Ta=25℃ unless otherwise specified

Parameter	Symbol	Test conditions	MIN	MAX	UNIT
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C=-10μA 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=-10μA I_C=0	-5	-	V
Collector cut-off current	I_{CBO}	V_{CB}=-50V I_E=0 V_{CB}=-50V I_E=0 T_A=125℃	-	-10	nA μA
Collector cut-off current	I_{CEX}	V_{CE}=-30V $V_{EB(OFF)}$=-0.5V	-	-50	nA
Base cut-off current	I_{BL}	V_{CE}=-30V $V_{EB(OFF)}$=-0.5V	-	-50	nA
DC current gain	h_{FE}	V_{CE}=-10V I_C=-100μA V_{CE}=-10V I_C=-1mA V_{CE}=-10V I_C=-10mA V_{CE}=-10V I_C=-150mA V_{CE}=-10V I_C=-500mA	75 100 100 100 50	- - - 300 -	
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=-150mA I_B=-15mA I_C=-500mA I_B=-50mA	-	-0.4 -1.6	V
Base-emitter saturation voltage	$V_{BE(sat)}$	I_C=-150mA I_B=-15mA I_C=-500mA I_B=-50mA	-	-1.3 -2.6	V
Transition frequency	f_T	V_{CE}=-20V,I_C=-50mA ,f=100MHz	200	-	MHz
Output Capacitance	C_{obo}	V_{CB}=-10V,f=1.0MHz,I_E=0	-	-8.0	pF
Input Capacitance	C_{ibo}	V_{EB}=-2.0V,f=1.0MHz,I_C=0	-	30	pF
Turn-on time	t_{on}	I_C=-150mA,V_{CC}=-30V,I_{B1}=-15mA	-	45	ns
Delay Time	t_d	V_{CC}=-30V,I_C=-150mA,I_{B1}=-15mA	-	10	ns
Rise Time	t_r		-	40	ns

TYPICAL CHARACTERISTICS @ Ta=25℃ unless otherwise specified

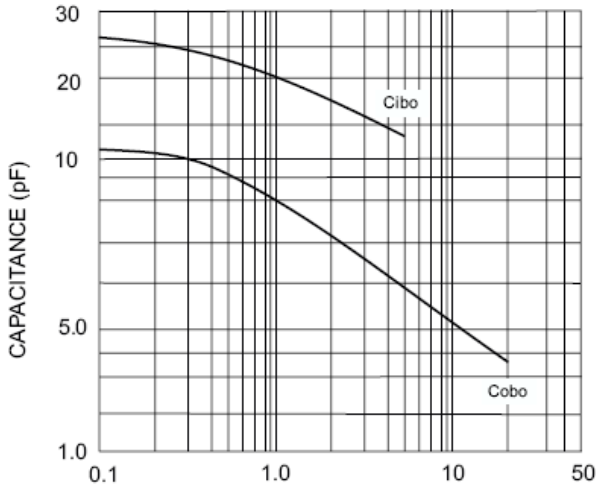


Fig. 1 (2222A) Capacitances (Typical)

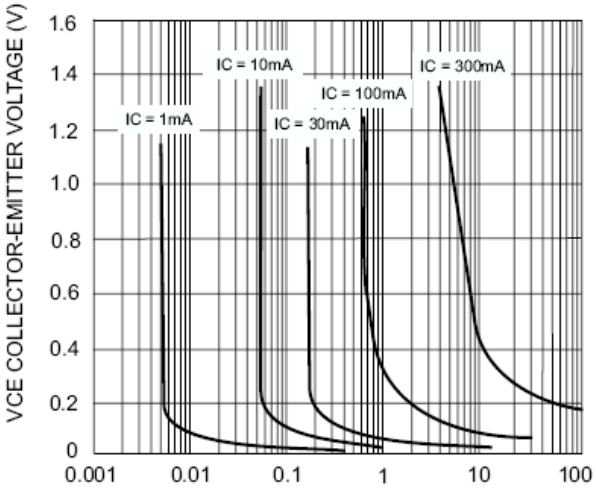


Fig. 4 (2907A) Typical Collector Saturation Region

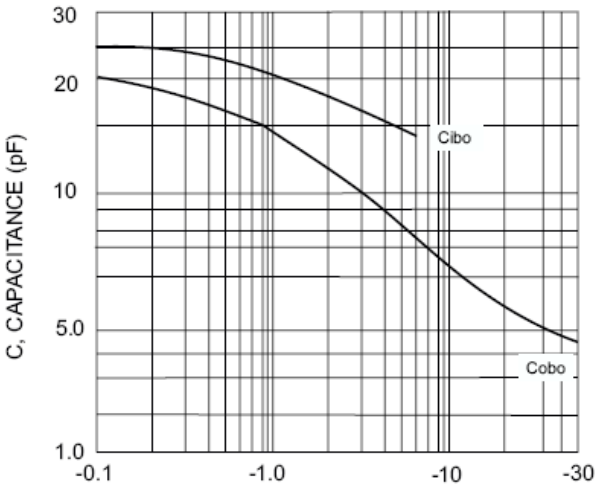


Fig. 3 (2907A) Capacitances (Typical)

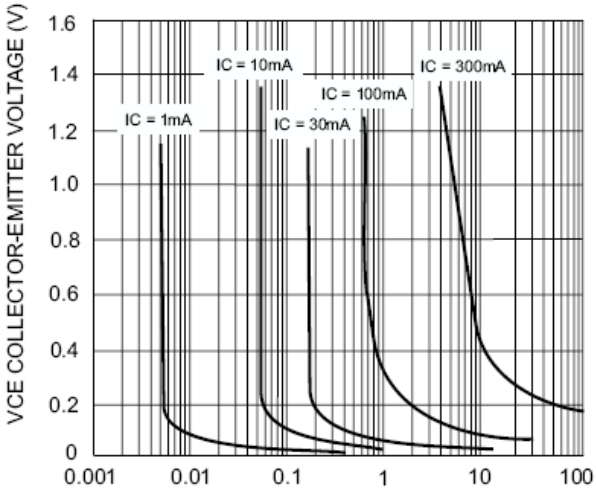


Fig. 4 (2907A) Typical Collector Saturation Region

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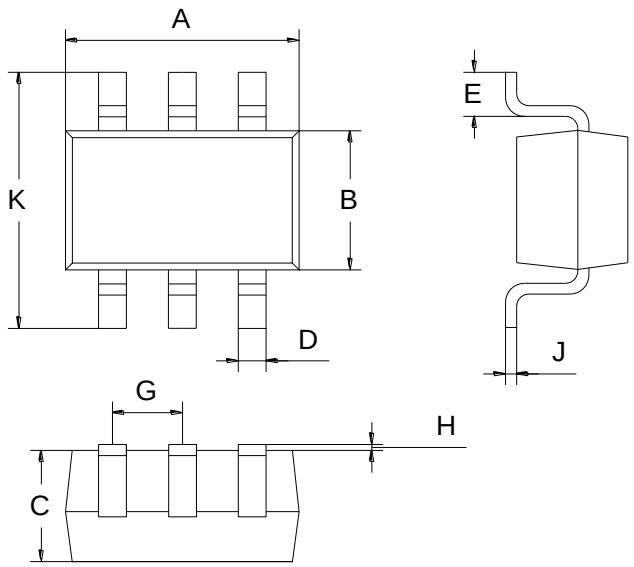
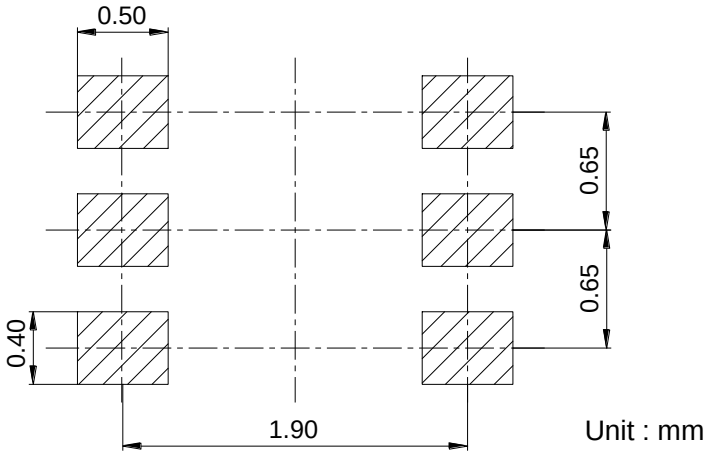
PACKAGE OUTLINE

Plastic surface mounted package



SOT-363		
Dim	Min	Max
A	2.00	2.20
B	1.15	1.35
C	0.85	1.05
D	0.15	0.35
E	0.25	0.40
G	0.60	0.70
H	0.02	0.10
J	0.05	0.15
K	2.20	2.40
All Dimensions in mm		

SOLDERING FOOTPRINT



PACKAGE INFORMATION

Device	Package	Shipping
MMDT2227	SOT-363	3000 pcs / Tape & Reel