

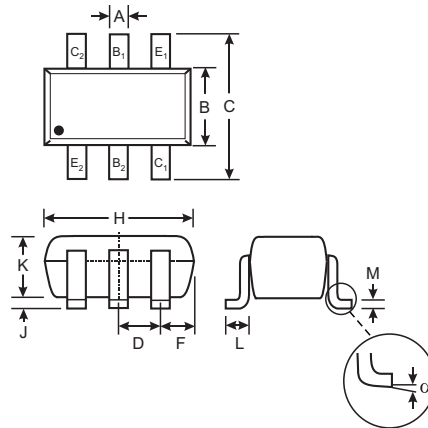
COMPLEMENTARY NPN / PNP SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

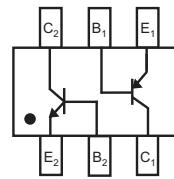
Complementary Pair
 Epitaxial Planar Die Construction
 One 2222A Type (NPN),
 One 2907A Type (PNP)
 Ideal for Low Power Amplification and Switching
Lead Free By Design/RoHS Compliant (Note 2)
"Green Device" (Note 3)

Mechanical Data

Case: SOT-26
 Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
 Moisture Sensitivity: Level 1 per J-STD-020C
 Terminals: Finish - Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
 Terminal Connections: See Diagram
 Ordering & Date Code Information: See Page 3
 Marking (See Page 3): K27
 Weight: 0.006 grams (approximate)



Note: E1, B1, and C1 = 2907A Type (PNP),
 E2, B2, and C2 = 2222A Type (NPN).
 Type marking indicates orientation.



SOT-26			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D			0.95
F			0.55
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
	0	8	
All Dimensions in mm			

Maximum Ratings, 2222A Type (NPN)

@ T_A = 25 °C unless otherwise specified

Characteristic	Symbol	2222A (NPN)	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	I _C	600	mA

Maximum Ratings, 2907A Type (PNP) @ T_A = 25 °C unless otherwise specified

Characteristic	Symbol	2907A (PNP)	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	I _C	-600	mA

Maximum Ratings, Total @ T_A = 25 °C unless otherwise specified

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 1)	P _d	300	mW
Thermal Resistance, Junction to Ambient (Note 1)	R _{JA}	417	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

- Note:
- Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com/datasheets/ap02001.pdf>.
 - No purposefully added lead.
 - Diodes Inc.'s "Green" policy can be found on our website at http://www.diodes.com/products/lead_free/index.php.

Electrical Characteristics, 2222A Type (NPN)

 @ T_A = 25 °C unless otherwise specified

Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 4)					
Collector-Base Breakdown Voltage	V _{(BR)CBO}	75		V	I _C = 10 A, I _E = 0
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	40		V	I _C = 10mA, I _B = 0
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	6.0		V	I _E = 10 A, I _C = 0
Collector Cutoff Current	I _{CBO}		10	nA A	V _{CB} = 60V, I _E = 0 V _{CB} = 60V, I _E = 0, T _A = 150 °C
Collector Cutoff Current	I _{CEX}		10	nA	V _{CE} = 60V, V _{EB(OFF)} = 3.0V
Emitter Cutoff Current	I _{EBO}		10	nA	V _{EB} = 3.0V, I _C = 0
Base Cutoff Current	I _{BL}		20	nA	V _{CE} = 60V, V _{EB(OFF)} = 3.0V
ON CHARACTERISTICS (Note 4)					
DC Current Gain	h _{FE}	35 50 75 100 40 50 35	300		I _C = 100 A, V _{CE} = 10V I _C = 1.0mA, V _{CE} = 10V I _C = 10mA, V _{CE} = 10V I _C = 150mA, V _{CE} = 10V I _C = 500mA, V _{CE} = 10V I _C = 10mA, V _{CE} = 10V, T _A = -55 °C I _C = 150mA, V _{CE} = 1.0V
Collector-Emitter Saturation Voltage	V _{CE(SAT)}		0.3 1.0	V	I _C = 150mA, I _B = 15mA I _C = 500mA, I _B = 50mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}	0.6	1.2 2.0	V	I _C = 150mA, I _B = 15mA I _C = 500mA, I _B = 50mA
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C _{obo}		8	pF	V _{CB} = 10V, f = 1.0MHz, I _E = 0
Input Capacitance	C _{ibo}	—	25	pF	V _{EB} = 0.5V, f = 1.0MHz, I _C = 0
Current Gain-Bandwidth Product	f _T	300		MHz	V _{CE} = 20V, I _C = 20mA, f = 100MHz
SWITCHING CHARACTERISTICS					
Delay Time	t _d		10	ns	V _{CC} = 30V, I _C = 150mA, V _{BE(off)} = - 0.5V, I _{B1} = 15mA
Rise Time	t _r		25	ns	
Storage Time	t _s		225	ns	V _{CC} = 30V, I _C = 150mA, I _{B1} = I _{B2} = 15mA
Fall Time	t _f		60	ns	

Note: 4. Pulse test: Pulse width 300 μs, duty cycle 2%.

Electrical Characteristics, 2907A Type (PNP) @ T_A = 25 °C unless otherwise specified

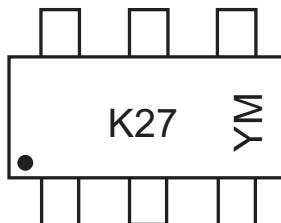
Characteristic	Symbol	Min	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 5)					
Collector-Base Breakdown Voltage	V _{(BR)CBO}	-60		V	I _C = -10 A, I _E = 0
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	-60		V	I _C = -10mA, I _B = 0
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	-5.0		V	I _E = -10 A, I _C = 0
Collector Cutoff Current	I _{CBO}		-10	nA A	V _{CB} = -50V, I _E = 0 V _{CB} = -50V, I _E = 0, T _A = 125 °C
Collector Cutoff Current	I _{CEX}		-50	nA	V _{CE} = -30V, V _{EB(OFF)} = -0.5V
Base Cutoff Current	I _{BL}		-50	nA	V _{CE} = -30V, V _{EB(OFF)} = -0.5V
ON CHARACTERISTICS (Note 5)					
DC Current Gain	h _{FE}	75 100 100 100 50	300		I _C = -100μA, V _{CE} = -10V I _C = -1.0mA, V _{CE} = -10V I _C = -10mA, V _{CE} = -10V I _C = -150mA, V _{CE} = -10V I _C = -500mA, V _{CE} = -10V
Collector-Emitter Saturation Voltage	V _{CE(SAT)}		-0.4 -1.6	V	I _C = -150mA, I _B = -15mA I _C = -500mA, I _B = -50mA
Base-Emitter Saturation Voltage	V _{BE(SAT)}		-1.3 -2.6	V	I _C = 150mA, I _B = 15mA I _C = 500mA, I _B = 50mA
SMALL SIGNAL CHARACTERISTICS					
Output Capacitance	C _{obo}		8.0	pF	V _{CB} = -10V, f = 1.0MHz, I _E = 0
Input Capacitance	C _{ibo}	—	30	pF	V _{EB} = -2.0V, f = 1.0MHz, I _C = 0
Current Gain-Bandwidth Product	f _T	200		MHz	V _{CE} = -20V, I _C = -50mA, f = 100MHz
SWITCHING CHARACTERISTICS					
Turn-On Time	t _{on}		45	ns	V _{CC} = -30V, I _C = -150mA, I _{B1} = -15mA
Delay Time	t _d		10	ns	
Rise Time	t _r		40	ns	
Turn-Off Time	t _{off}		100	ns	V _{CC} = -6.0V, I _C = -150mA, I _{B1} = I _{B2} = -15mA
Storage Time	t _s		80	ns	
Fall Time	t _f		30	ns	

Note: 5. Short duration pulse test used to minimize self-heating effect.

Ordering Information (Note 6)

Device	Packaging	Shipping
MMDT2227M-7	SOT-26	3000/Tape & Reel

Note: 6. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information


K27 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year ex: S = 2005
 M = Month ex: 9 = September

Date Code Key

Year	2005	2006	2007	2008	2009	2010	2011	2012
Code	S	T	U	V	W	X	Y	Z

Month	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

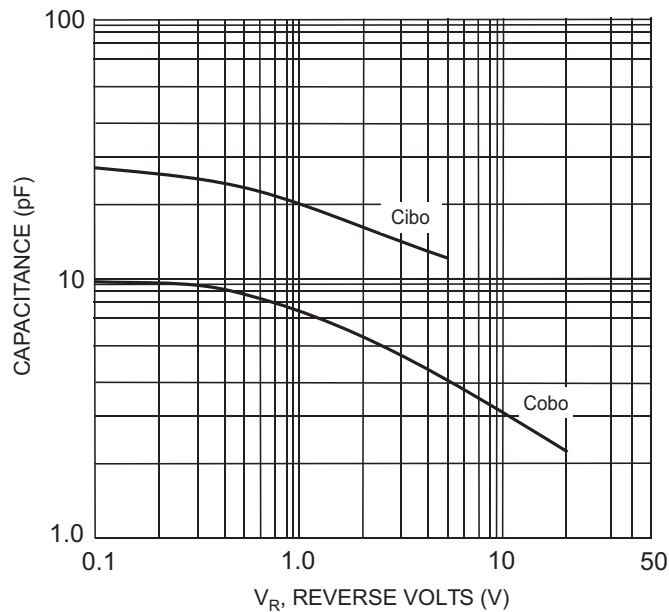


Fig. 1 (2222A) Typical Capacitance

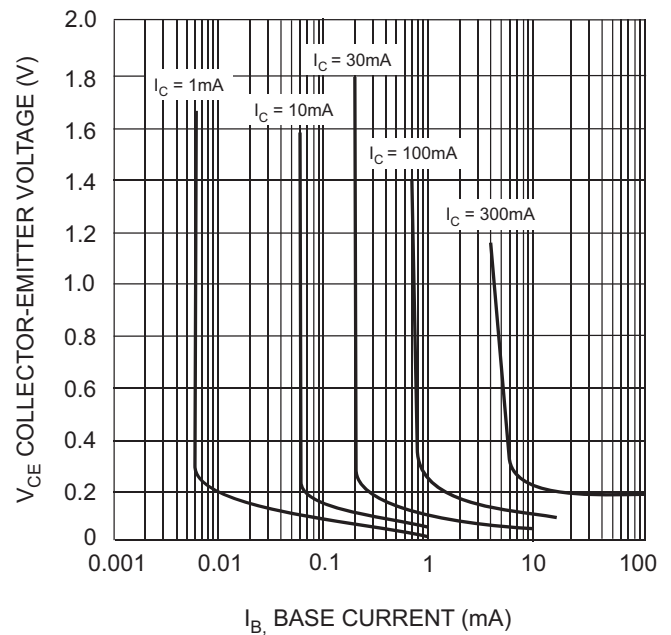


Fig. 2 (2222A) Typical Collector Saturation Region

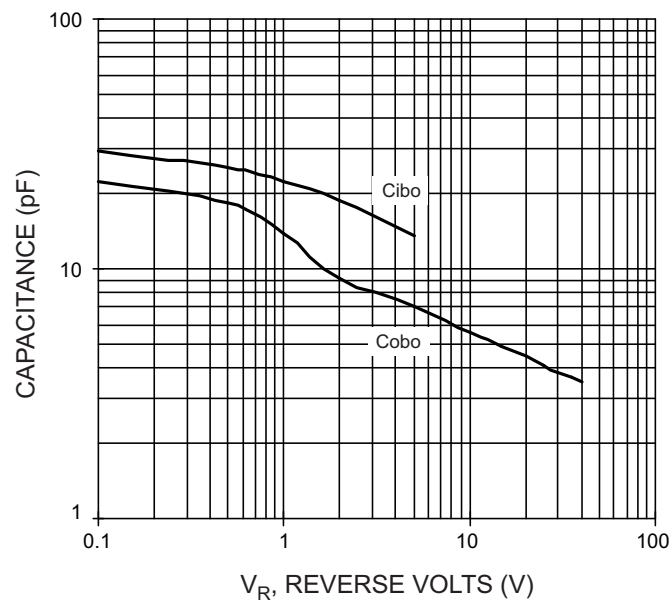


Fig. 3 (2907A) Typical Capacitance

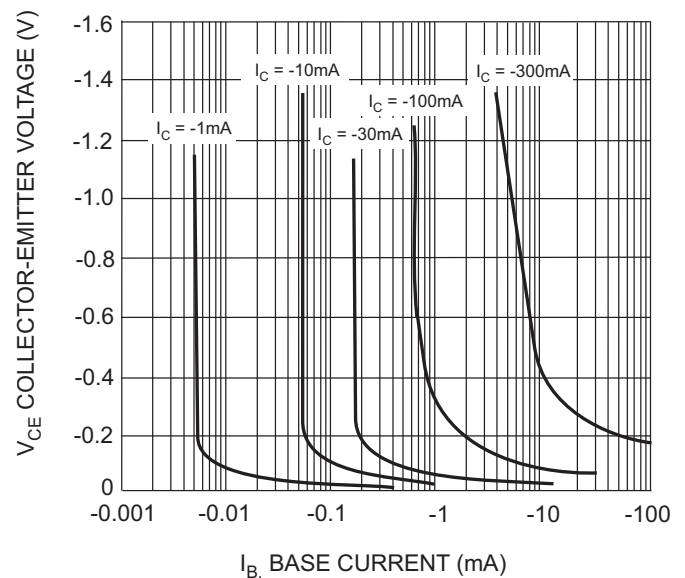


Fig. 4 (2907A) Typical Collector Saturation Region

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- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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