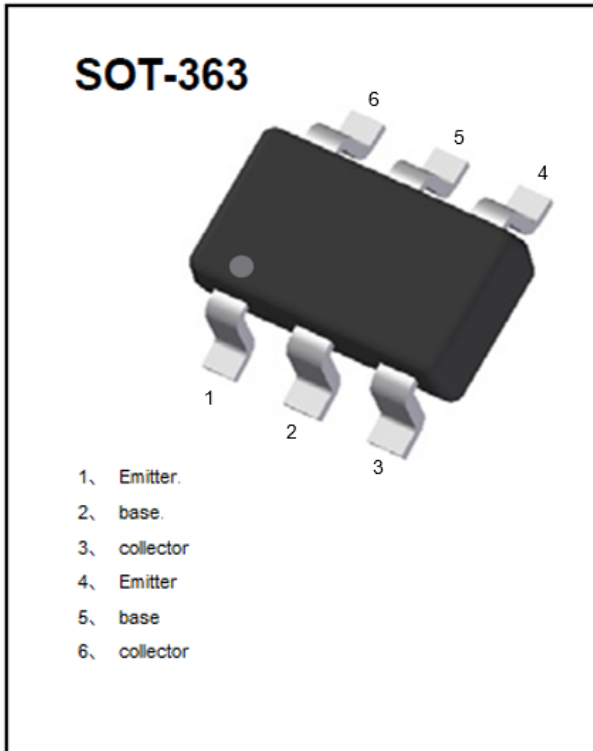


Dual NPN Small Signal Transistor



Features

- Epoxy meets UL-94 V-0 flammability rating
- Surface mount package ideally Suited for Automatic Insertion
- Reduces number of components and board space
- Part no. with suffix "Q" means AEC-Q101 qualified

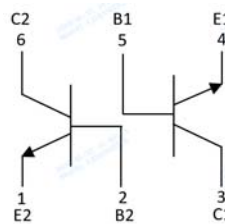
Application

- Ideal for low power amplification and switching

Mechanical Data

- **Package:** SOT-363
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Marking:** K1P

Equivalent circuit



■Maximum Ratings (Ta=25°C Unless otherwise specified)

Item	Symbol	Unit	Value
Collector-Base Voltage	V_{CBO}	V	75
Collector-Emitter Voltage	V_{CEO}	V	40
Emitter-Base Voltage	V_{EBO}	V	6
Collector Current -Continuous	I_C	mA	600
Total Device Dissipation (*)	P_D	mW	200
Thermal Resistance Junction to Ambient (*)	R_{thJA}	K/W	625
Junction Temperature	T_J	°C	150
Storage Temperature	T_{STG}	°C	-55 to +150

(*) Device mounted on FR-4 PCB 1.0 x 1.0 x 0.06 inch



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■ Electrical Characteristics (Ta=25°C unless otherwise specified)

Item	Symbol	Unit	Conditions	Min	TYP	Max	
Collector-base breakdown voltage	V_{CBO}	V	$I_C=10\mu A, I_E=0$	75			
Collector-emitter breakdown voltage	V_{CEO}	V	$I_C=10mA, I_B=0$	40			
Emitter-base breakdown voltage	V_{EBO}	V	$I_E=10\mu A, I_C=0$	6			
Collector cut-off current	I_{CBO}	nA	$V_{CB}=60V, I_E=0$			10	
Collector cut-off current	I_{CEX}	nA	$V_{CE}=60V, V_{EB(off)}=3V$			10	
Emitter cut-off current	I_{EBO}	nA	$V_{EB}=3V, I_C=0$			10	
Base cut-off Current	I_{BL}	nA	$V_{CE}=60V, V_{EB(off)}=3V$			20	
DC current gain	h_{FE1}		$V_{CE}=10V, I_C=0.1mA$	35			
	h_{FE2}		$V_{CE}=10V, I_C=1mA$	50			
	h_{FE3}		$V_{CE}=10V, I_C=10mA$	75			
	h_{FE4}		$V_{CE}=10V, I_C=150mA$	100		300	
	h_{FE5}		$V_{CE}=1V, I_C=150mA$	35			
	h_{FE6}		$V_{CE}=10V, I_C=500mA$	40			
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C=150mA, I_B=15mA$			0.3	
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C=500mA, I_B=50mA$			1	
Base-emitter saturation voltage	$V_{BE(sat)}$	V	$I_C=150mA, I_B=15mA$			1.2	
Base-emitter saturation voltage	$V_{BE(sat)}$	V	$I_C=500mA, I_B=50mA$			2	
Transition frequency	f_T	MHz	$V_{CE}=20V, I_C=20mA, f=100MHz$	300			
Delay time	t_d	ns	$V_{CC}=30V, I_C=150mA, I_{B1}=15mA, V_{BE(off)}=-0.5V$			10	
Rise time	t_r	ns				25	
Storage time	t_s	ns		$V_{CC}=30V, I_C=150mA, I_{B1}=-I_{B2}=5mA$			225
Fall time	t_f	ns					60

■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
MMDT2222AQ	F2	Approximate 0.009g	3000	30000	120000	7" reel



■ Characteristics (Typical)

Fig.1-Static Characteristic

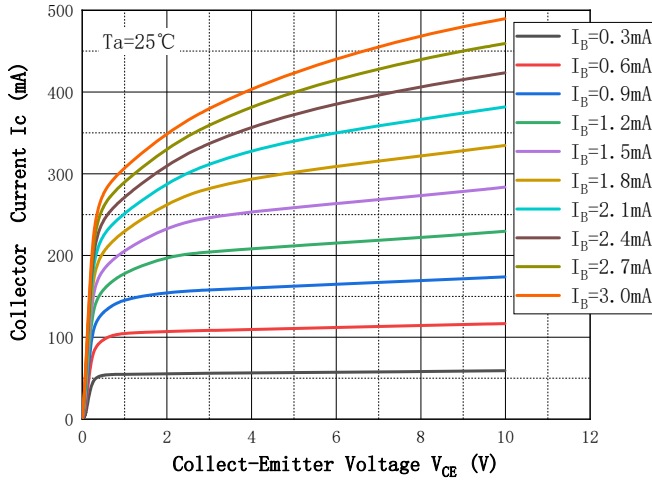


Fig.2 - DC Current Gian

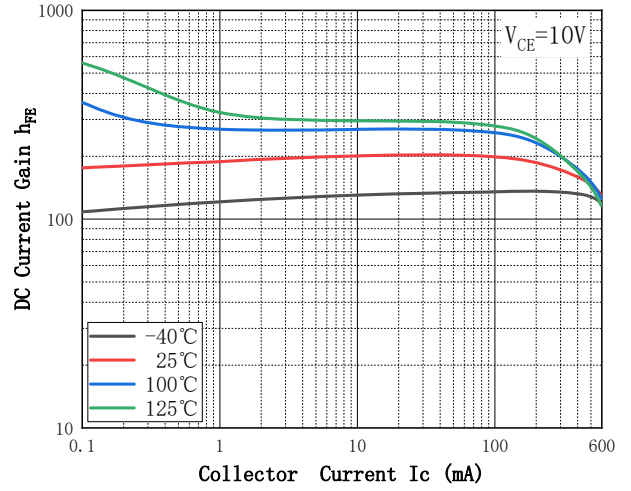


Fig.3 - Collect-Emittor Saturation Voltage

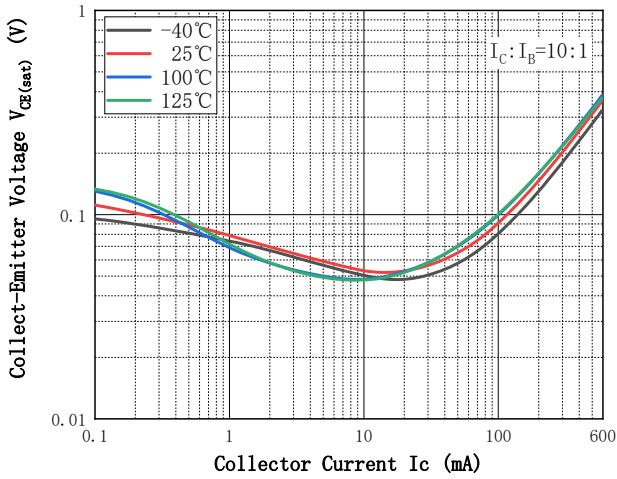


Fig.4 - Base-Emittor Voltage

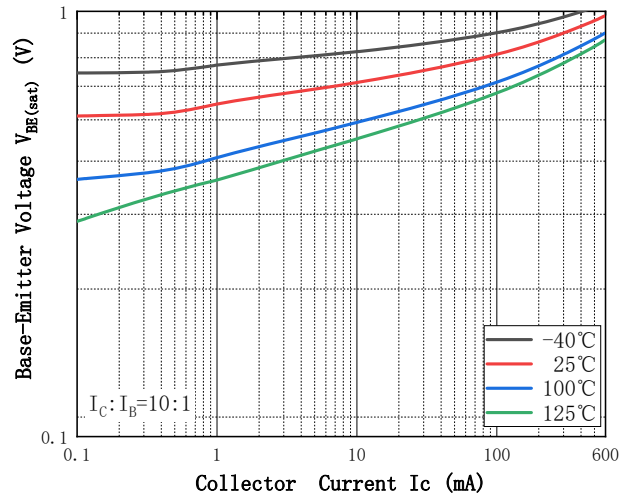


Fig.5 - Base-Emittor On Voltage

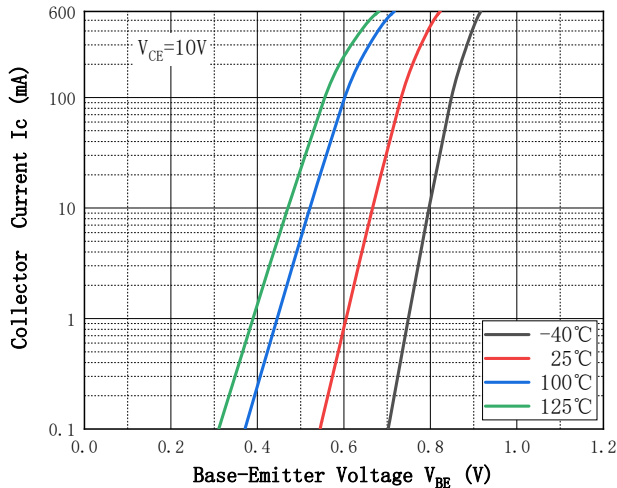
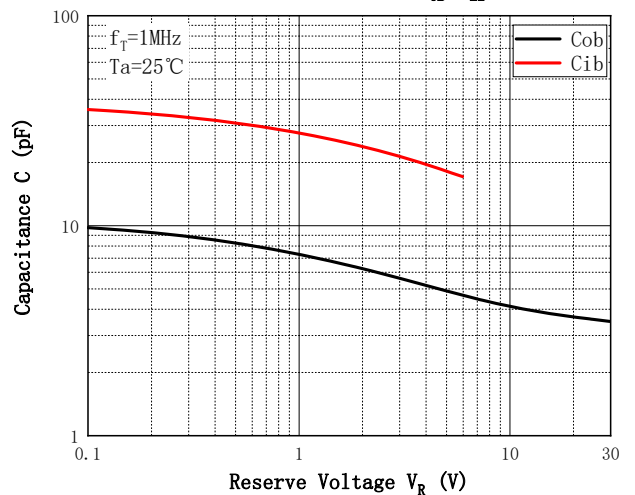


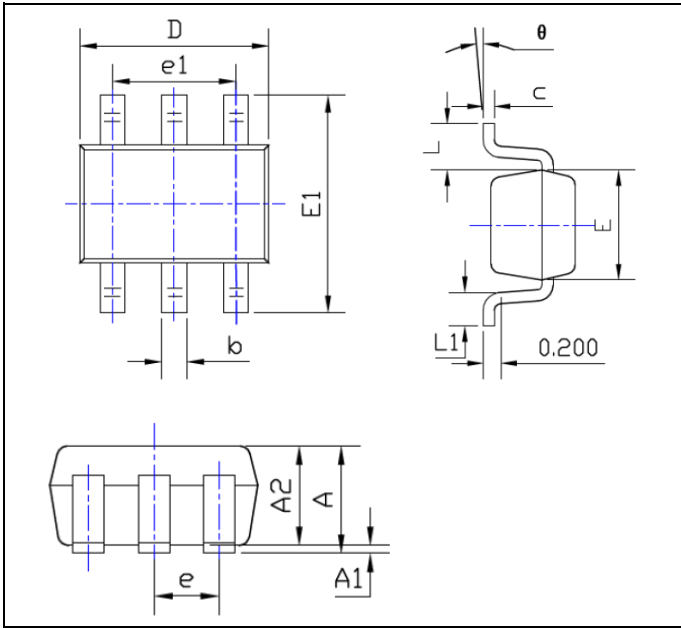
Fig.6 - Cob/Cib— V_{CE}/V_{EB}





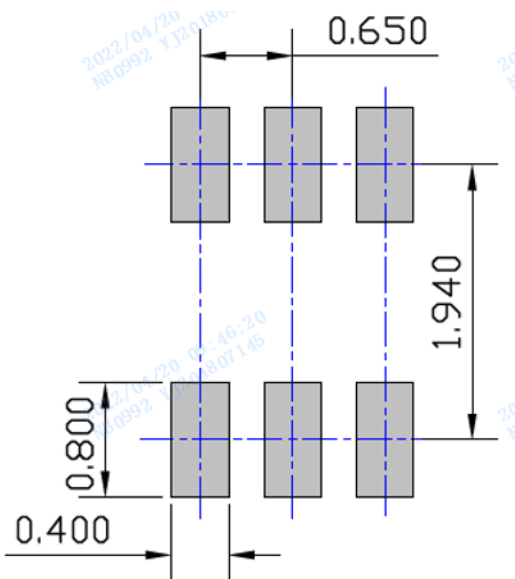
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■SOT-363 Package Outline Dimensions



SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.035	0.043	0.900	1.100
A1	0.000	0.004	0.000	0.100
A2	0.035	0.039	0.900	1.000
b	0.006	0.014	0.150	0.350
c	0.004	0.010	0.100	0.250
D	0.071	0.087	1.800	2.200
E	0.045	0.053	1.150	1.350
E1	0.085	0.096	2.150	2.450
e	0.026TYP		0.650TYP	
e1	0.047	0.055	1.200	1.400
L	0.021REF		0.525REF	
L1	0.010	0.018	0.260	0.460
theta	0°	8°	0°	8°

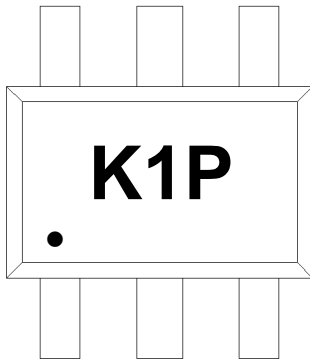
■SOT-363 Soldering Footprint



Unit: mm



■ Marking Information



Note:

1. All marking is at middle of the product body
2. All marking is in laser marking
3. K1P is Marking Code
4. Body color: Black



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