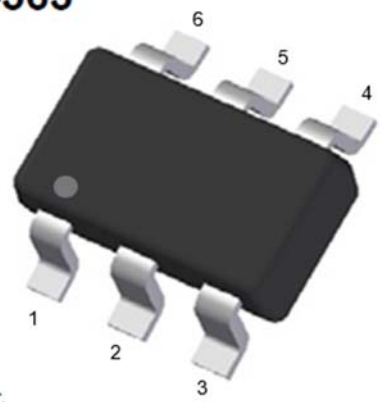
Dual NPN+PNP Small Signal Transistor

SOT-363



1、 Emitter.
2、 base.
3、 collector
4、 Emitter
5、 base
6、 collector

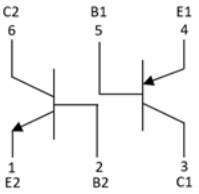
Features

- Epoxy meets UL-94 V-0 flammability rating
- Surface mount package ideally Suited for Automatic Insertion
- Moisture Sensitivity Level 1
- Part no. with suffix “Q” means AEC-Q101 qualified

Mechanical Data

- **Package:** SOT-363
- **Terminals:** Tin plated leads, solderable per J-STD-002 and JESD22-B102
- **Marking:** K27

Equivalent circuit



■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
MMDT2227Q	F2	Approximate 0.009g	3000	30000	120000	7” reel

■TR1 PNP Pin3、4、5 Maximum Ratings (Ta=25℃ Unless otherwise specified)

ITEM	SYMBOL	UNIT	CONDITIONS	VALUE
Collector-Base Voltage	V_{CBO}	V	I_C = -10μA, I_E = 0	-60
Collector-Emitter Voltage	V_{CEO}	V	I_C = -10mA, I_B = 0	-60
Emitter-Base Voltage	V_{EBO}	V	I_E = -10μA, I_C = 0	-5
Collector Current	I_C	mA		-600
Collector Power Dissipation (*)	P_C	mW		200
Thermal Resistance Junction to Ambient (*)	R_{thJA}	℃/W		625
Junction Temperature	T_j	℃		-55 to +150
Storage Temperature	T_{stg}	℃		-55 to +150

■TR2 NPN Pin1、2、6 Maximum Ratings (Ta=25℃ Unless otherwise specified)

ITEM	SYMBOL	UNIT	CONDITIONS	VALUE
Collector-Base Voltage	V_{CBO}	V	I_C = 10μA,I_E = 0	75
Collector-Emitter Voltage	V_{CEO}	V	I_C = 10mA,I_B = 0	40
Emitter-Base Voltage	V_{EBO}	V	I_E = 10μA,I_C = 0	6
Collector Current	I_C	mA		600
Collector Power Dissipation	P_C (*)	mW		200
Thermal Resistance Junction to Ambient	R_{thJA} (*)	℃/W		625
Junction Temperature	T_j	℃		-55 to +150
Storage Temperature	T_{stg}	℃		-55 to +150

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

■TR1 PNP Pin3、4、5 Electrical Characteristics (Ta=25℃ unless otherwise specified)

ITEM	SYMBOL	UNIT	CONDITIONS	MIN.	TYP.	MAX.
Collector-base breakdown voltage	V_{CBO}	V	I_C = -10μA, I_E = 0	-60		
Collector-emitter breakdown voltage	V_{CEO}	V	I_C = -10mA, I_B = 0	-60		
Emitter-base breakdown voltage	V_{EBO}	V	I_E = -10μA, I_C = 0	-5		
Collector-Base cut-off current	I_{CBO}	nA	V_{CB} = -50V, I_E = 0			-10
Collector cut-off current	I_{CEX}	nA	V_{CE} = -30V, $V_{EB(off)}$ = -0.5V			-50
Emitter-Base Cut-off current	I_{EBO}	nA	V_{EB} = -5V, I_C = 0			-10
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	$V_{CE(sat)}$	V	I_C = -150mA, I_B = -15mA			-0.4
			I_C = -500mA, I_B = -50mA			-1.6
Baser-emitter saturation voltage	$V_{BE(sat)}$	V	I_C = -150mA, I_B = -15mA			-1.3
			I_C = -500mA, I_B = -50mA			-2.6
Transition frequency	f_T	MHz	V_{CE} = -20V, I_C = -50mA, f = 100MHz	200		
Delay time	t_d	ns	V_{CC} = -30V, I_C = -150mA, I_{B1} = -15mA			10
Rise time	t_r	ns				40
Storage time	t_s	ns	V_{CC} = -6V, I_C = -150mA, I_{B1} = -I_{B2} = -15mA			225
Fall time	t_f	ns				60

■TR2 NPN Pin1、2、6 Electrical Characteristics (Ta=25℃ unless otherwise specified)

ITEM	SYMBOL	UNIT	CONDITIONS	MIN.	TYP.	MAX.
Collector-base breakdown voltage	V_{CBO}	V	I_C = 10μA,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 = 10μA,I_C = 0	6		
Collector-Base 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-Base 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	$h_{FE}1$		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} = 1V, I_C = 150mA	35		
	$h_{FE}6$		V_{CE} = 10V, I_C = 500mA	40		
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	I_C = 150mA, I_B = 15mA			0.3
			I_C = 500mA, I_B = 50mA			1
Baser-emitter saturation voltage	$V_{BE(sat)}$	V	I_C = 150mA, I_B = 15mA			1.2
			I_C = 500mA, I_B = 50mA			2
Transition frequency	f_T	MHz	V_{CE} = 20V, I_C = 20mA, f = 100MHz	300		
Delay time	td	ns	V_{CC} = 30V, I_C = 150mA, I_{B1} = 15mA, $V_{BE(off)}$ = -0.5V			10
Rise time	tr	ns				25
Storage time	ts	ns	V_{CC} = 30V, I_C = 150mA, I_{B1}=- I_{B2}=5mA			225
Fall time	tf	ns				60

■ TR1 PNP Pin3、4、5 Characteristics (Typical)

Fig. 1 - Static characteristic

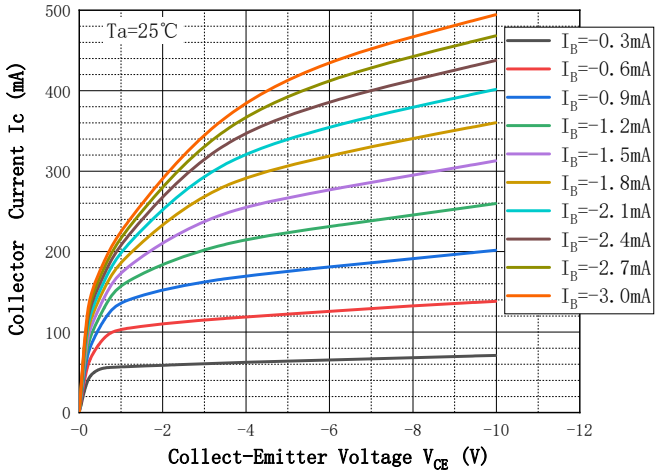


Fig. 2 - DC Current Gain

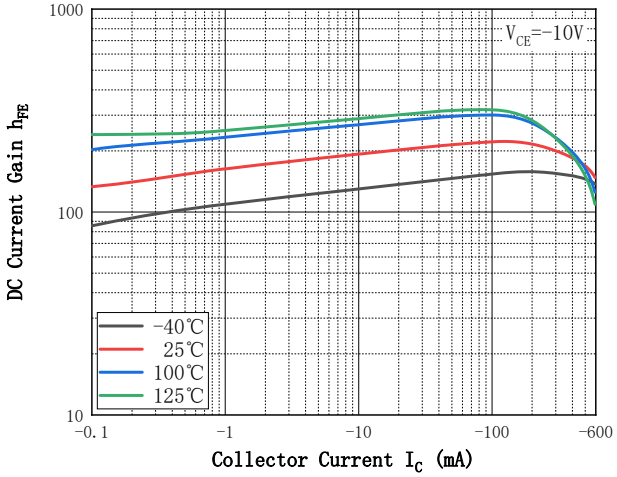


Fig. 3 - Collect-Emitter Saturation Voltage

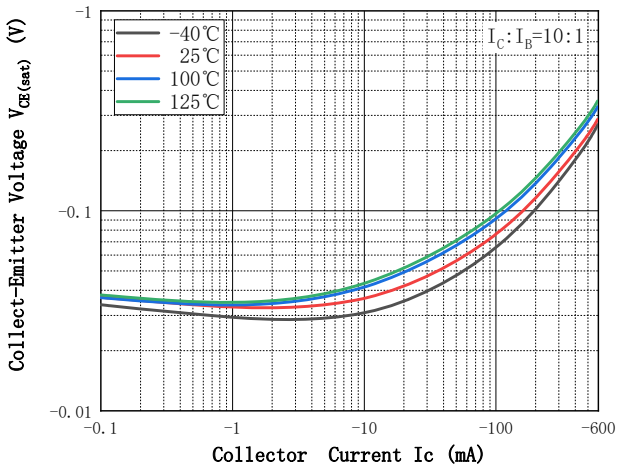


Fig. 4 - Base-Emitter Voltage

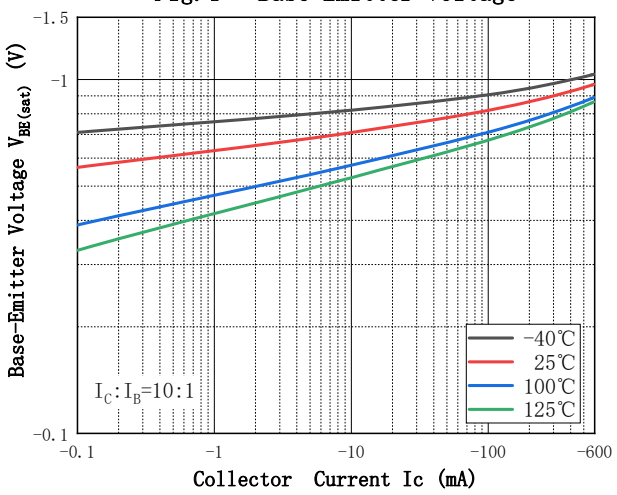


Fig. 5 - Base-Emitter On Voltage

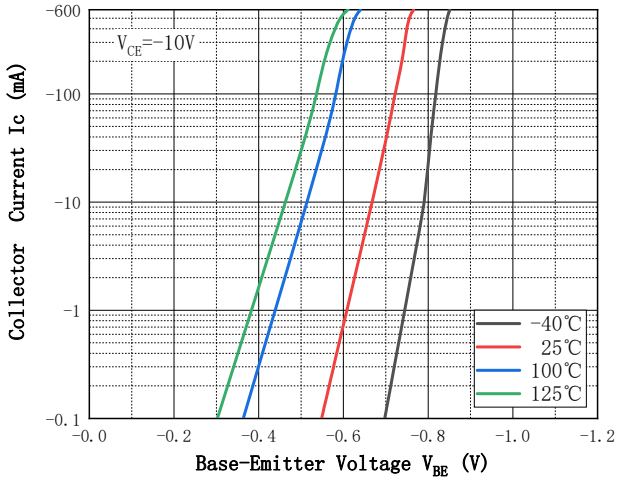
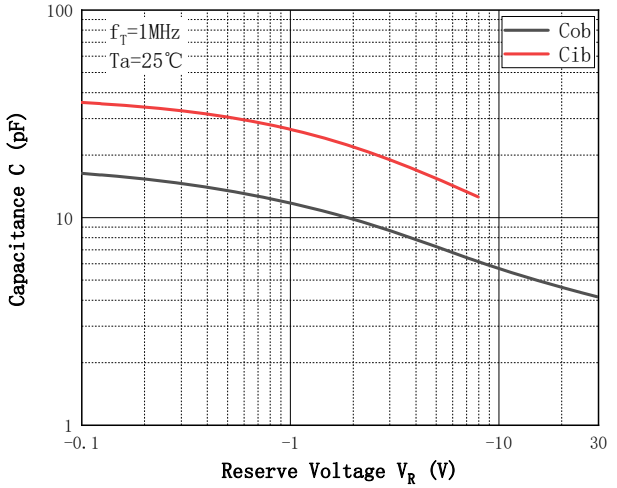


Fig. 6 - Cob/Cib—VCB/VEB



■ TR2 NPN Pin1、2、6 Characteristics (Typical)

Fig.1-Static Characteristic

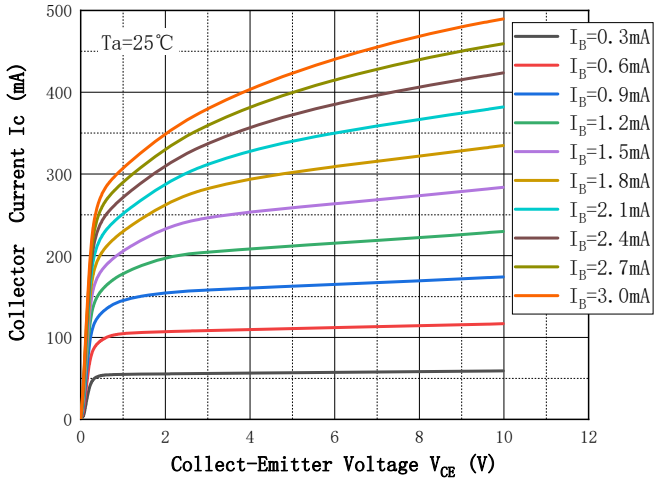


Fig.2 - DC Current Gian

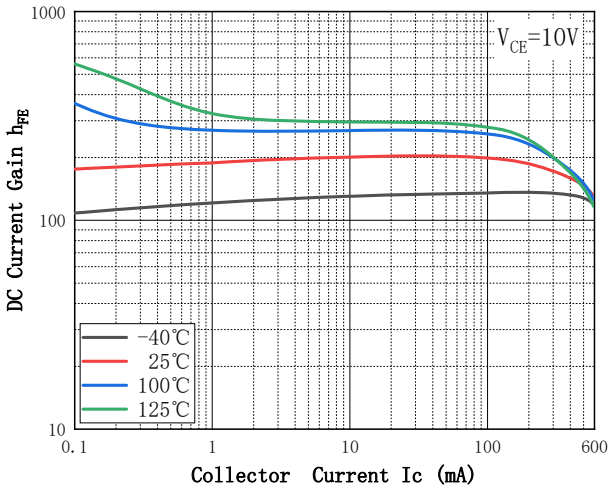


Fig.3 - Collect-Emitter Saturation Voltage

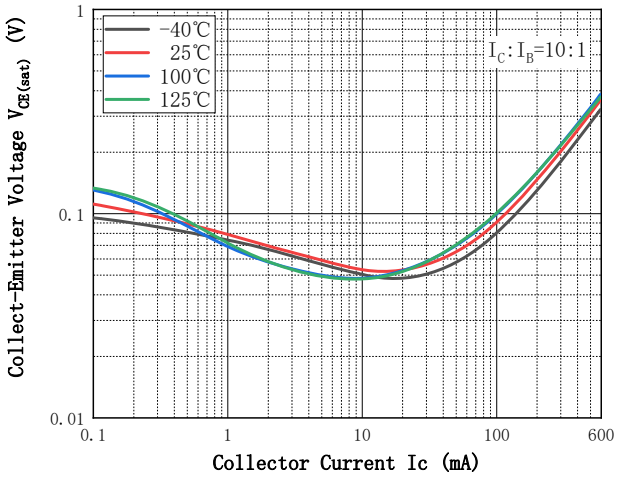


Fig.4 - Base-Emitter Voltage

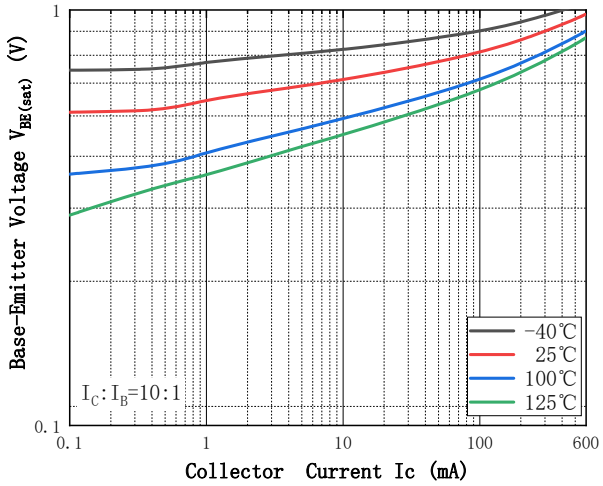


Fig.5 - Base-Emitter On Voltage

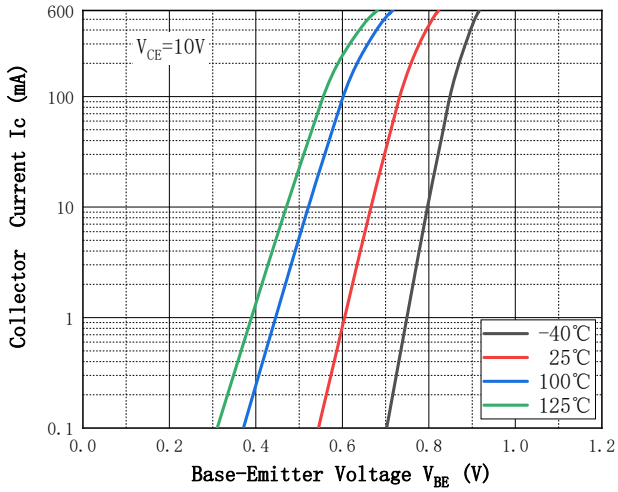
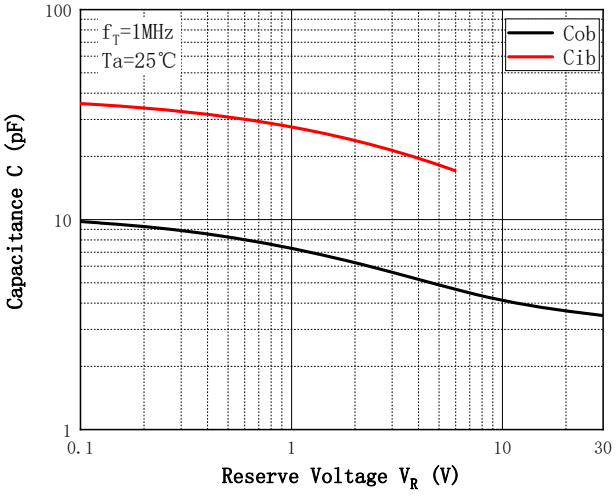
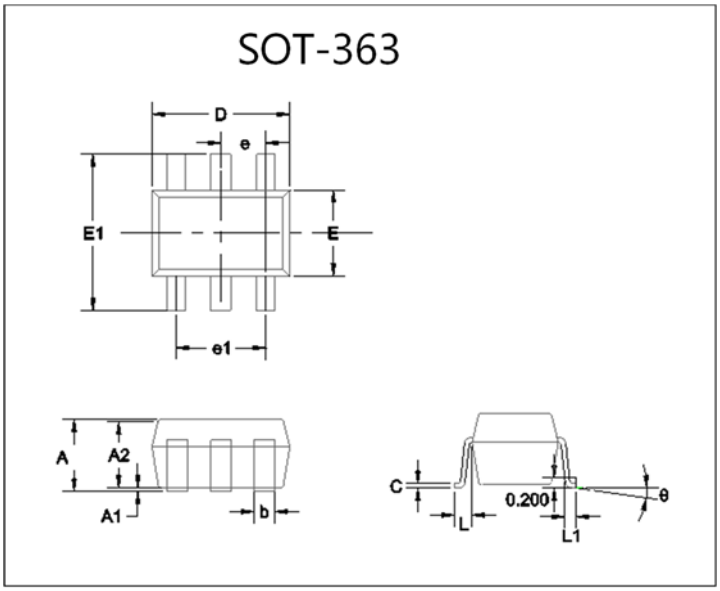


Fig.6 - Cob/Cib—V_{CB}/V_{EB}

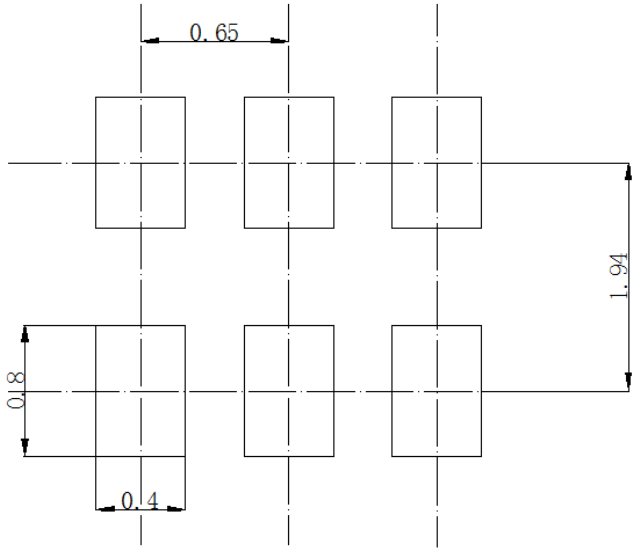


■SOT-363 Package Outline Dimensions



DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	0.035	0.043	0.90	1.10	
A1	0.000	0.004	0.00	0.10	
A2	0.035	0.039	0.90	1.00	
b	0.006	0.014	0.15	0.35	
c	0.002	0.010	0.05	0.25	
D	0.071	0.087	1.80	2.20	
E	0.045	0.053	1.15	1.35	
E1	0.085	0.096	2.15	2.45	
e	0.026Typ		0.65Typ		
e1	0.047	0.055	1.20	1.40	
L	0.021Typ		0.525Typ		
L1	0.010	0.018	0.26	0.46	
θ	0°	8°	0°	8°	

■SOT-363 Soldering Footprint



Unit：mm

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