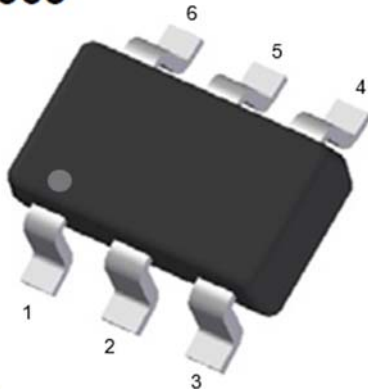


## Dual NPN+PNP Small Signal Transistor

### SOT-363



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

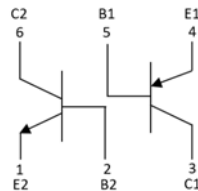
### Features

- 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:** K46

### Equivalent circuit



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

ITEM	SYMBOL	UNIT	CONDITIONS	VALUE
Collector-Base Voltage	$V_{CBO}$	V	$I_C = -10\mu A, I_E = 0$	-40
Collector-Emitter Voltage	$V_{CEO}$	V	$I_C = -1mA, I_B = 0$	-40
Emitter-Base Voltage	$V_{EBO}$	V	$I_E = -10\mu A, I_C = 0$	-5
Collector Current	$I_C$	mA		-200
Collector Power Dissipation	$P_C$	mW		200
Junction Temperature	$T_j$	°C		-55 to +150
Storage Temperature	$T_{stg}$	°C		-55 to +150

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

ITEM	SYMBOL	UNIT	CONDITIONS	VALUE
Collector-Base Voltage	$V_{CBO}$	V	$I_C = 10\mu A, I_E = 0$	60
Collector-Emitter Voltage	$V_{CEO}$	V	$I_C = 1mA, I_B = 0$	40
Emitter-Base Voltage	$V_{EBO}$	V	$I_E = 10\mu A, I_C = 0$	6
Collector Current	$I_C$	mA		200
Collector Power Dissipation	$P_C$	mW		200
Junction Temperature	$T_j$	°C		-55 to +150
Storage Temperature	$T_{stg}$	°C		-55 to +150



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

ITEM	SYMBOL	UNIT	CONDITIONS	MIN.	TYP.	MAX.
Collector-base breakdown voltage	$V_{CBO}$	V	$I_C = -10\mu A, I_E = 0$	-40		
Collector-emitter breakdown voltage	$V_{CEO}$	V	$I_C = -1mA, I_B = 0$	-40		
Emitter-base breakdown voltage	$V_{EBO}$	V	$I_E = -10\mu A, I_C = 0$	-5		
Collector-base cut-off current	$I_{CBO}$	nA	$V_{CB} = -30V, I_E = 0$			-100
Emitter-base cut-off current	$I_{EBO}$	nA	$V_{EB} = -3V, I_C = 0$			-100
DC current gain	$h_{FE1}$		$V_{CE} = -1V, I_C = -0.1mA$	40		
	$h_{FE2}$		$V_{CE} = -1V, I_C = -1mA$	70		
	$h_{FE3}$		$V_{CE} = -1V, I_C = -10mA$	100		300
	$h_{FE4}$		$V_{CE} = -1V, I_C = -50mA$	60		
	$h_{FE5}$		$V_{CE} = -1V, I_C = -100mA$	30		
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C = -10mA, I_B = -1mA$			-0.25
			$I_C = -50mA, I_B = -5mA$			-0.4
Baser-emitter saturation voltage	$V_{BE(sat)}$	V	$I_C = -10mA, I_B = -1mA$	-0.65		-0.85
			$I_C = -50mA, I_B = -5mA$			-0.95
Transition frequency	$f_T$	MHz	$V_{CE} = -20V, I_C = -10mA,$ $f = 100MHz$	250		
Delay time	$t_d$	ns	$V_{CC} = -3V, I_C = -10mA, V_{BE} = -0.5V,$ $I_{B1} = -1mA$			35
Rise time	$t_r$	ns				35
Storage time	$t_s$	ns	$V_{CC} = -3V, I_C = -10mA,$ $I_{B1} = -I_{B2} = -1mA$			225
Fall time	$t_f$	ns				75



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

ITEM	SYMBOL	UNIT	CONDITIONS	MIN.	TYP.	MAX.
Collector-base breakdown voltage	$V_{CBO}$	V	$I_C = 10\mu A, I_E = 0$	60		
Collector-emitter breakdown voltage	$V_{CEO}$	V	$I_C = 1mA, I_B = 0$	40		
Emitter-base breakdown voltage	$V_{EBO}$	V	$I_E = 10\mu A, I_C = 0$	6		
Collector-base cut-off current	$I_{CBO}$	nA	$V_{CB} = 30V, I_E = 0$			100
Collector cut-off current	$I_{CEX}$	nA	$V_{CE} = 30V, V_{EB} = 3V$			50
Emitter-base cut-off current	$I_{EBO}$	nA	$V_{EB} = 3V, I_C = 0$			100
DC current gain	$h_{FE1}$		$V_{CE} = 1V, I_C = 0.1mA$	40		
	$h_{FE2}$		$V_{CE} = 1V, I_C = 1mA$	70		
	$h_{FE3}$		$V_{CE} = 1V, I_C = 10mA$	100		300
	$h_{FE4}$		$V_{CE} = 1V, I_C = 50mA$	60		
	$h_{FE5}$		$V_{CE} = 1V, I_C = 100mA$	30		
Collector-emitter saturation voltage	$V_{CE(sat)}$	V	$I_C = 10mA, I_B = 1mA$			0.2
			$I_C = 50mA, I_B = 5mA$			0.3
Baser-emitter saturation voltage	$V_{BE(sat)}$	V	$I_C = 10mA, I_B = 1mA$	0.65		0.85
			$I_C = 50mA, I_B = 5mA$			0.95
Transition frequency	$f_T$	MHZ	$V_{CE} = 20V, I_C = 10mA,$ $f = 100MHz$	250		
Delay time	$t_d$	ns	$V_{CC} = 3V, I_C = 10mA, V_{BE} = 0.5V,$ $I_{B1} = 1mA$			35
Rise time	$t_r$	ns				35
Storage time	$t_s$	ns	$V_{CC} = 3V, I_C = 10mA,$ $I_{B1} = - I_{B2} = 1mA$			200
Fall time	$t_f$	ns				50

## ■ Ordering Information (Example)

PREFERED P/N	PACKING CODE	UNIT WEIGHT(g)	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
MMDT3946Q	F2	Approximate 0.009g	3000	30000	120000	7" reel



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

Fig.1 - Static Characteristic

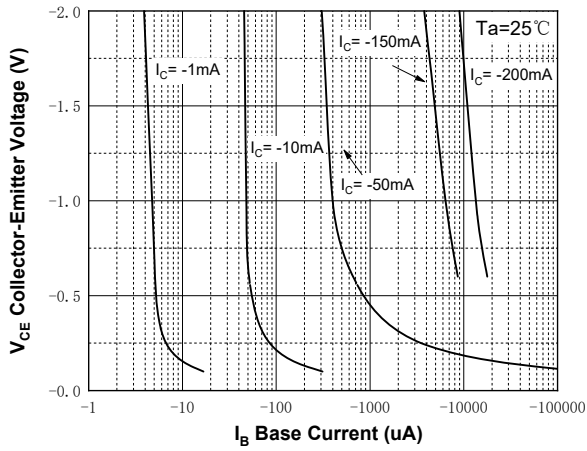


Fig.2 - DC Current Gain

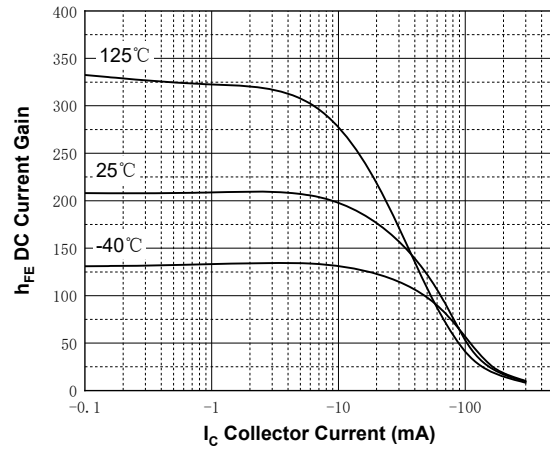


Fig.3 - Collector-Emitter Saturation Voltage

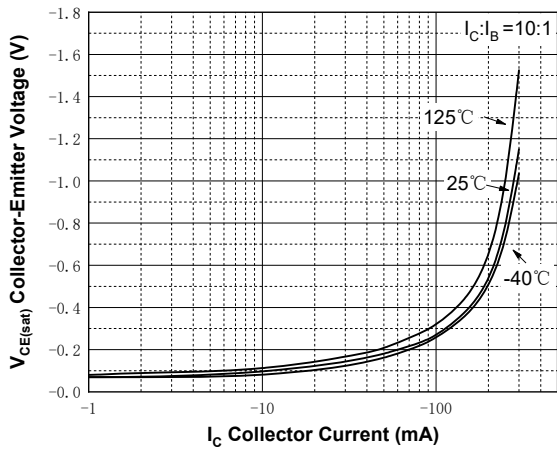


Fig.4 - Base-Emitter Saturation Voltage

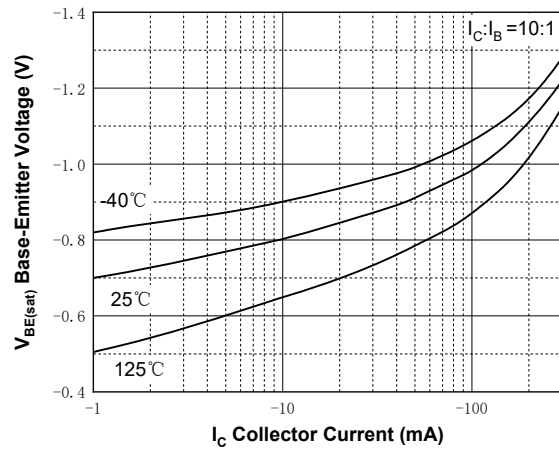
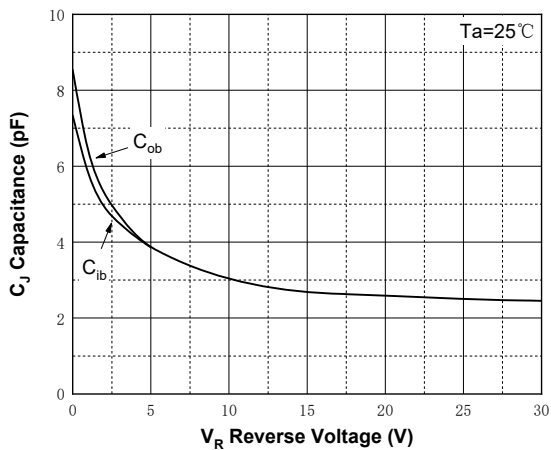


Fig.5 - Capacitance





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

Fig.1 - Static Characteristic

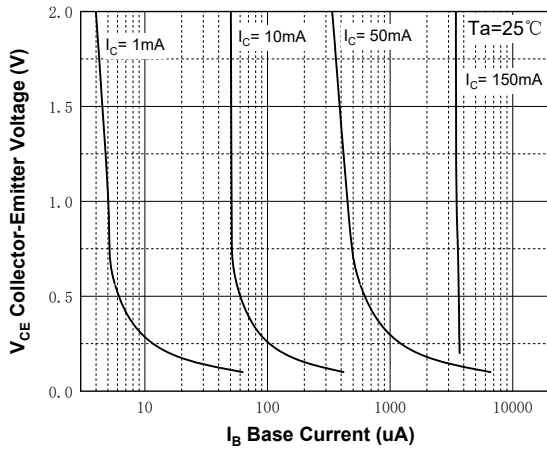


Fig.2 - DC Current Gain

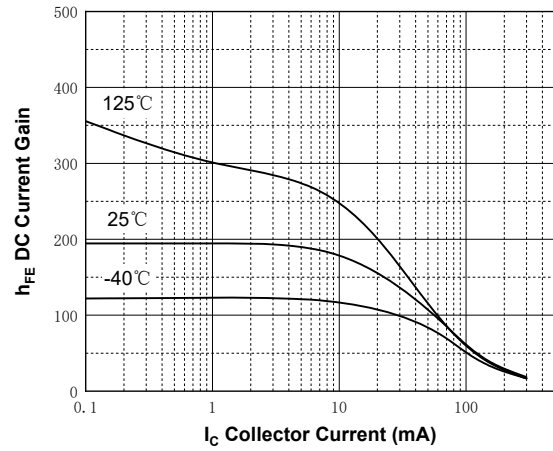


Fig.3 - Collector-Emitter Saturation Voltage

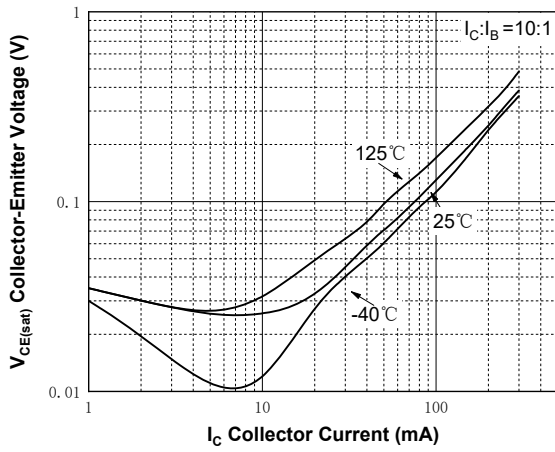


Fig.4 - Base-Emitter Saturation Voltage

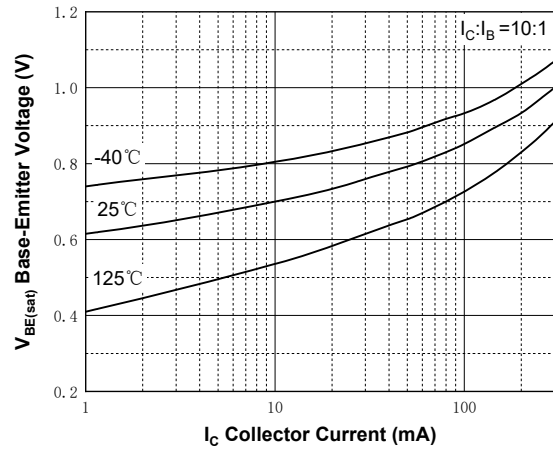
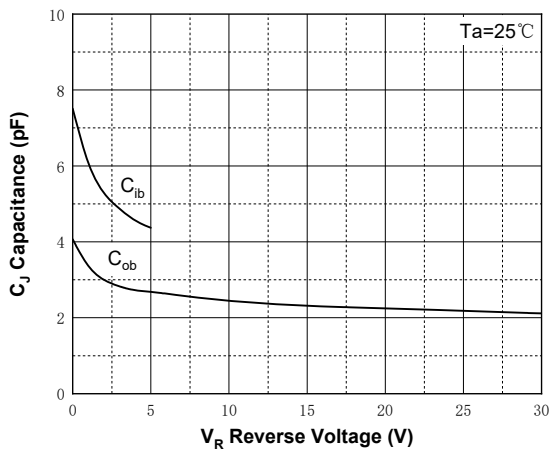
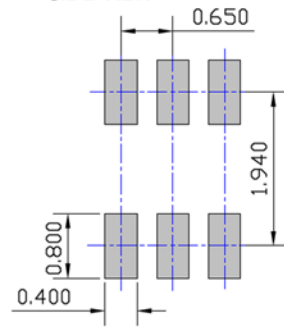
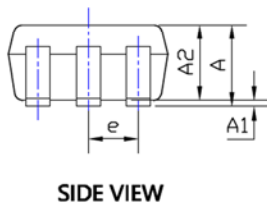
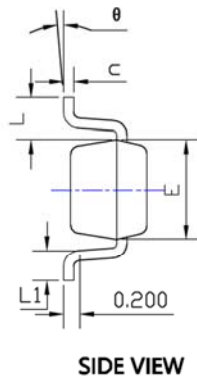
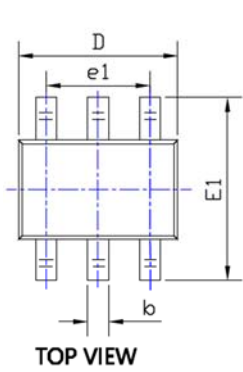


Fig.5 - Capacitance



## ■SOT-363 Package Outline Dimensions & Soldering Footprint



UNIT: mm

SUGGESTED SOLDER PAD LAYOUT

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°

**NOTE:**

- 1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
- 2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.
- 3.THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.



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