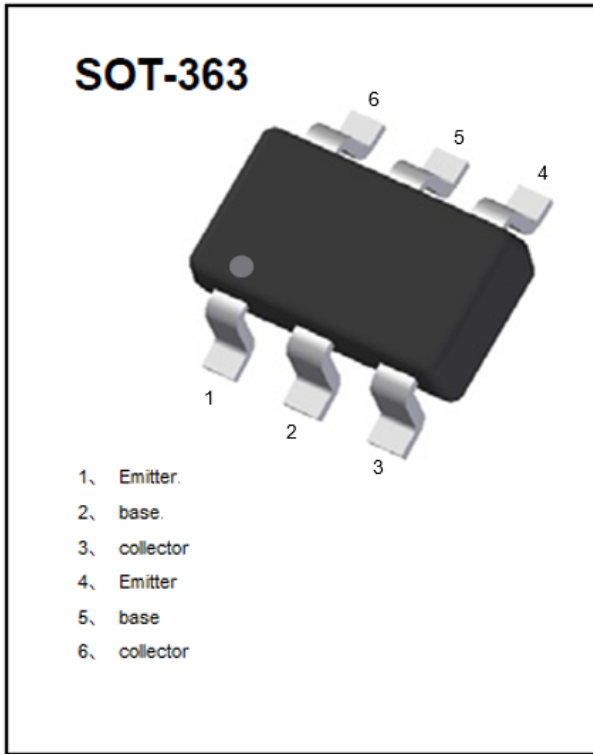


## Dual NPN+PNP Small Signal Transistor



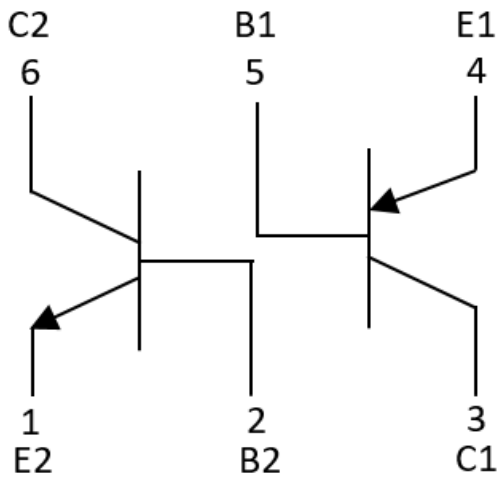
### Features

- Epoxy meets UL-94 V-0 flammability rating
- Surface mount package ideally Suited for Automatic Insertion
- NPN/PNP

### 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
MMDT2227	F2	Approximate 0.009g	3000	30000	120000	7" reel



# MMDT2227

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

Item	Symbol	Unit	Conditions	Value
Collector-Base Voltage	VCBO	V	IC=-10μA,IE=0	-60
Collector-Emitter Voltage	VCEO	V	IC=-10mA,IB=0	-60
Emitter-Base Voltage	VEBO	V	IE=-10μA,IC=0	-5
Collector Current -Continuous	IC	mA		-600
Total Device Dissipation	PC	mW		200
Junction Temperature	Tj	°C		150
Storage Temperature	TSTG	°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 <sub>CBO</sub>	V	IC=-10μA,IE=0	-60		
Collector-emitter breakdown voltage	V <sub>CEO</sub>	V	IC=-10mA,IB=0	-60		
Emitter-base breakdown voltage	V <sub>EBO</sub>	V	IE=-10μA,IC=0	-5		
Collector cut-off current	I <sub>CBO</sub>	nA	VCB=-50V,IE=0			-10
Collector cut-off current	I <sub>CEx</sub>	nA	VCE=-30V,VEB(off)=-0.5V			-50
Emmitter cut-off current	I <sub>EBO</sub>	nA	VEB=-5V, IC=0			-10
DC current gain	h <sub>FE1</sub>		VCE=-10V,IC=-0.1mA	75		
	h <sub>FE2</sub>		VCE=-10V,IC=-1mA	100		
	h <sub>FE3</sub>		VCE=-10V,IC=-10mA	100		
	h <sub>FE4</sub>		VCE=-10V,IC=-150mA	100		300
	h <sub>FE5</sub>		VCE=-10V,IC=-500mA	50		
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	V	IC=-150mA,IB=-15mA			-0.4
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	V	IC=-500mA,IB=-50mA			-1.6
Base-emitter saturation voltage	V <sub>BE(sat)</sub>	V	IC=-150mA,IB=-15mA			-1.3
Base-emitter saturation voltage	V <sub>BE(sat)</sub>	V	IC=-500mA,IB=-50mA			-2.6
Transition frequency	f <sub>T</sub>	MHz	VCE=-20V,IC=-50mA,f=100MHz	200		
Delay time	t <sub>d</sub>	ns	VCC=-30V,IC=-150mA,IB1=-15mA			10
Rise time	t <sub>r</sub>	ns				40
Storage time	t <sub>s</sub>	ns	VCC=-6V,IC=-150mA,IB1=-IB2=-15mA			225
Fall time	t <sub>f</sub>	ns				60



# MMDT2227

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

Item	Symbol	Unit	Conditions	Value
Collector-Base Voltage	V <sub>CBO</sub>	V	IC=10μA,IE=0	75
Collector-Emitter Voltage	V <sub>CEO</sub>	V	IC=10mA,IB=0	40
Emitter-Base Voltage	V <sub>EBO</sub>	V	IE=10μA,IC=0	6
Collector Current -Continuous	IC	mA		600
Total Device Dissipation	PC	mW		200
Junction Temperature	T <sub>j</sub>	°C		150
Storage Temperature	TSTG	°C		-55 to +150

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

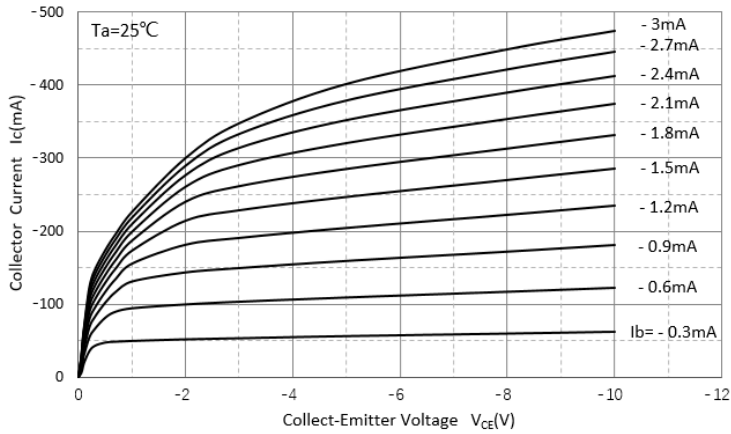
Item	Symbol	Unit	Conditions	Min	TYP	Max
Collector-base breakdown voltage	V <sub>CBO</sub>	V	IC=10μA,IE=0	75		
Collector-emitter breakdown voltage	V <sub>CEO</sub>	V	IC=10mA,IB=0	40		
Emitter-base breakdown voltage	V <sub>EBO</sub>	V	IE=10μA,IC=0	6		
Collector cut-off current	I <sub>CBO</sub>	nA	V <sub>CB</sub> =60V,IE=0			10
Collector cut-off current	I <sub>CEX</sub>	nA	V <sub>CE</sub> =60V,V <sub>EB(off)</sub> =3V			10
Emmitter cut-off current	I <sub>EBO</sub>	nA	V <sub>EB</sub> =3V, IC=0			10
Base cut-off Current	I <sub>BL</sub>	nA	V <sub>CE</sub> =60V,V <sub>EB(off)</sub> =3V			20
DC current gain	h <sub>FE1</sub>		V <sub>CE</sub> =10V,IC=0.1mA	35		
	h <sub>FE2</sub>		V <sub>CE</sub> =10V,IC=1mA	50		
	h <sub>FE3</sub>		V <sub>CE</sub> =10V,IC=10mA	75		
	h <sub>FE4</sub>		V <sub>CE</sub> =10V,IC=150mA	100		300
	h <sub>FE5</sub>		V <sub>CE</sub> =1V,IC=150mA	35		
	h <sub>FE6</sub>		V <sub>CE</sub> =10V,IC=500mA	40		
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	V	IC=150mA,IB=15mA			0.3
Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	V	IC=500mA,IB=50mA			1
Base-emitter saturation voltage	V <sub>BE(sat)</sub>	V	IC=150mA,IB=15mA			1.2
Base-emitter saturation voltage	V <sub>BE(sat)</sub>	V	IC=500mA,IB=50mA			2
Transition frequency	f <sub>T</sub>	MHz	V <sub>CE</sub> =20V,IC=20mA,f=100MHz	300		
Delay time	t <sub>d</sub>	ns	V <sub>CC</sub> =30V,IC=150mA, IB1=15mA,V <sub>BE(off)</sub> =-0.5V			10
Rise time	t <sub>r</sub>	ns				25
Storage time	t <sub>s</sub>	ns	V <sub>CC</sub> =30V,IC=150mA, IB1=- IB2=5mA			225
Fall time	t <sub>f</sub>	ns				60



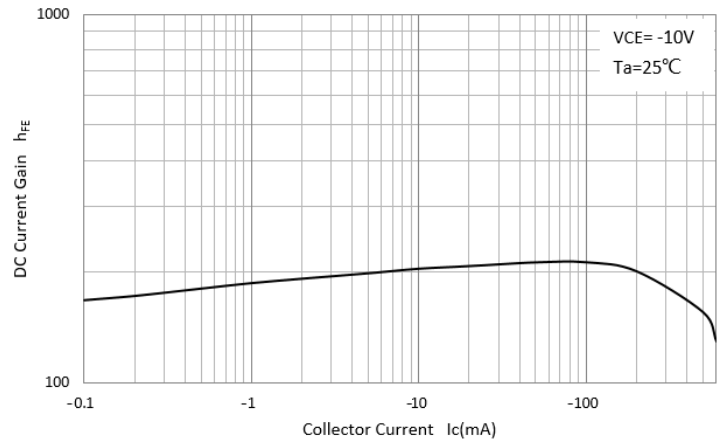
# MMDT2227

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

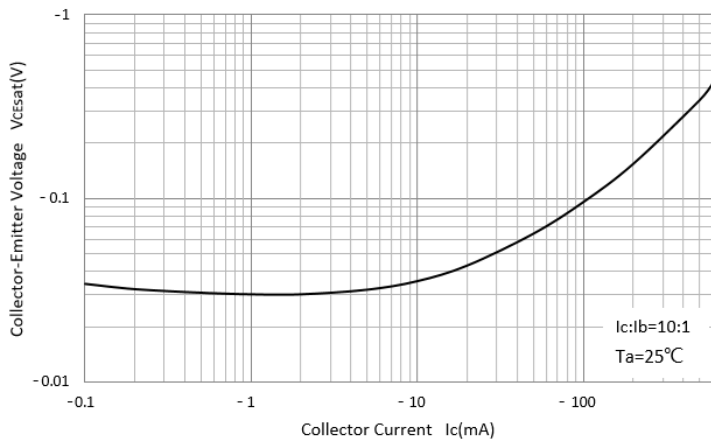
Static Characteristic



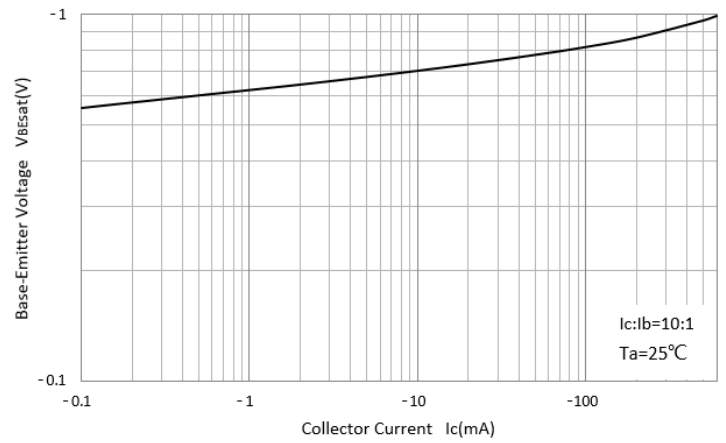
DC Current Gain



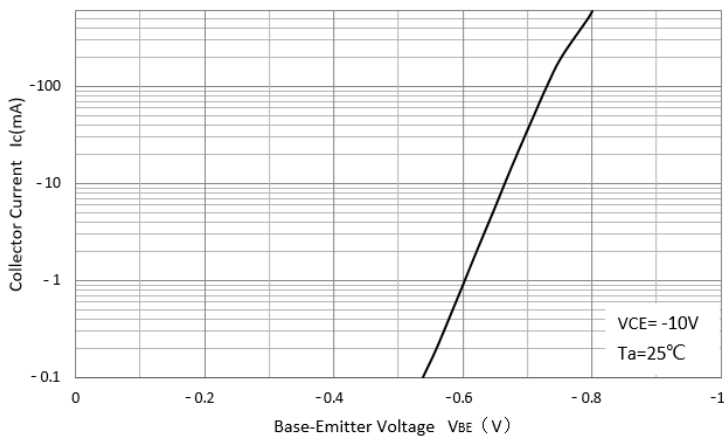
Collector-Emittor Saturation Voltage



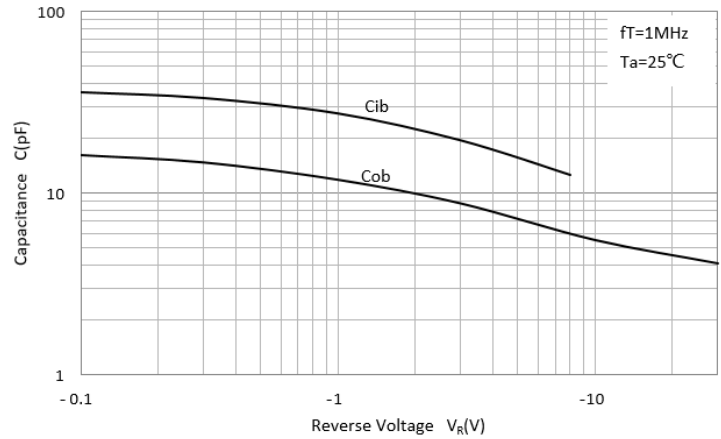
Base-Emittor Saturation Voltage



Base-Emittor On Voltage



$C_{ob}/C_{ib}-V_{CB}/V_{EB}$

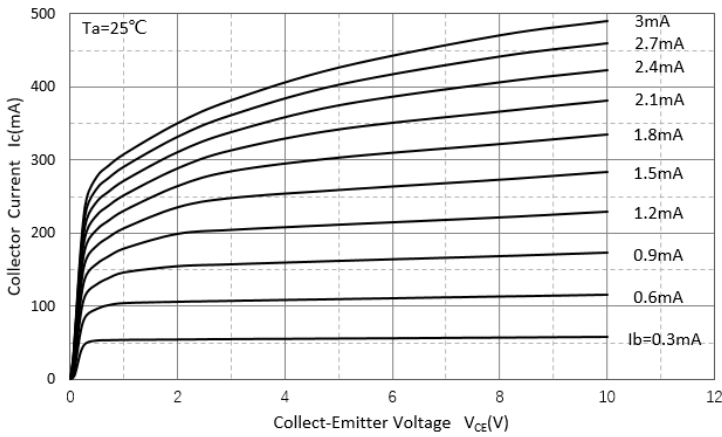




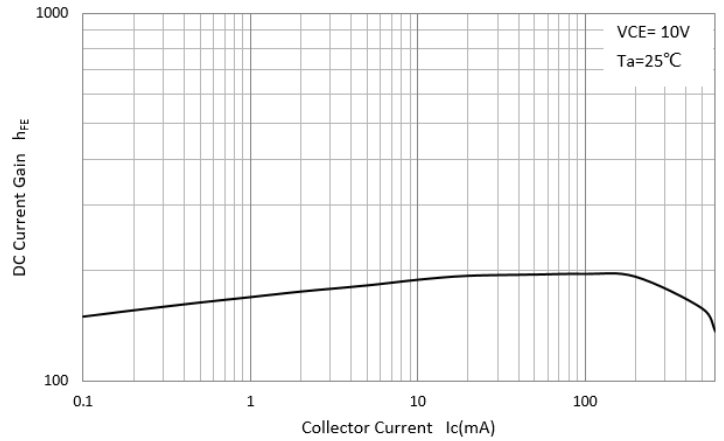
# MMDT2227

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

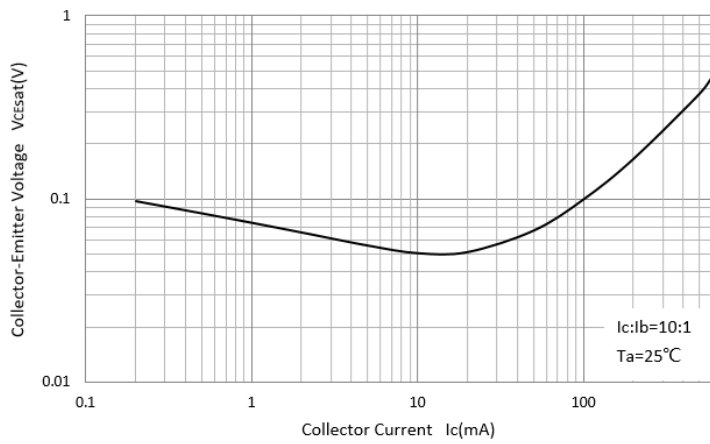
### Static Characteristic



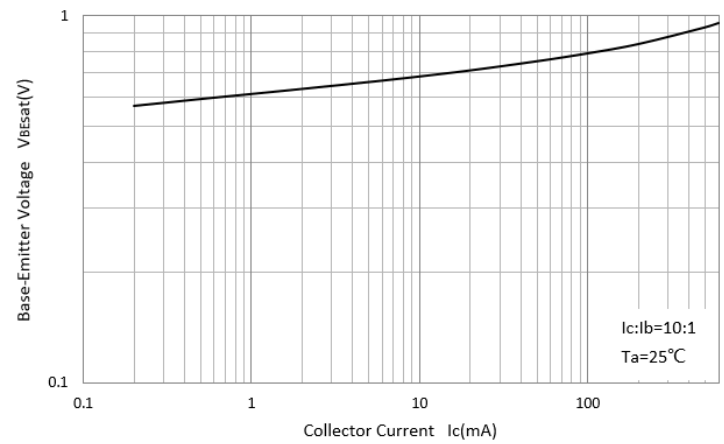
### DC Current Gain



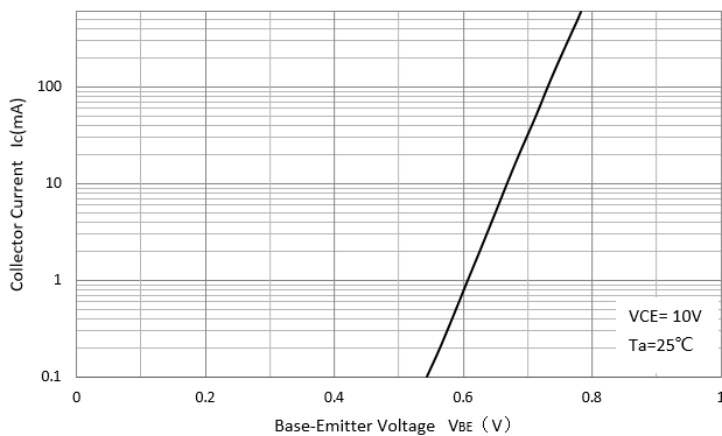
### Collector-Emitter Saturation Voltage



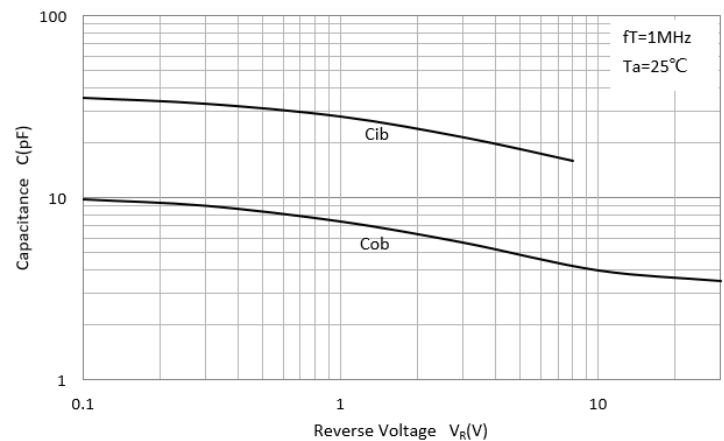
### Base-Emitter Saturation Voltage



### Base-Emitter On Voltage



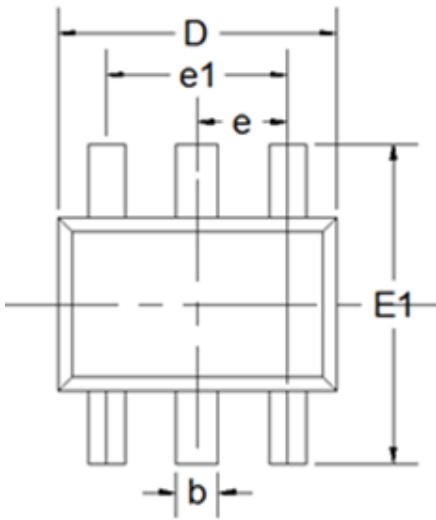
### Cob/Cib-V<sub>CB</sub>/V<sub>EB</sub>



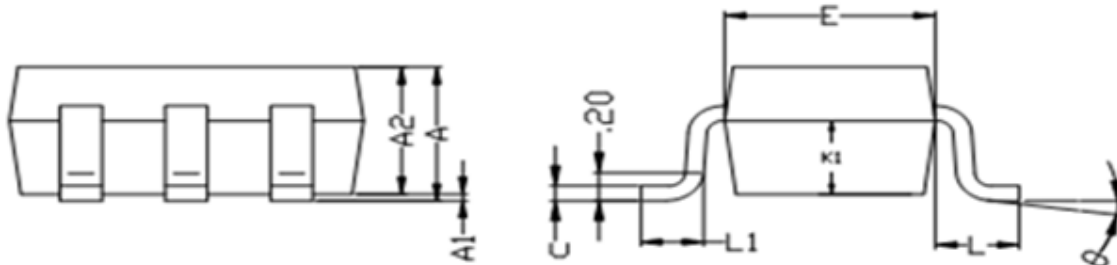


# MMDT2227

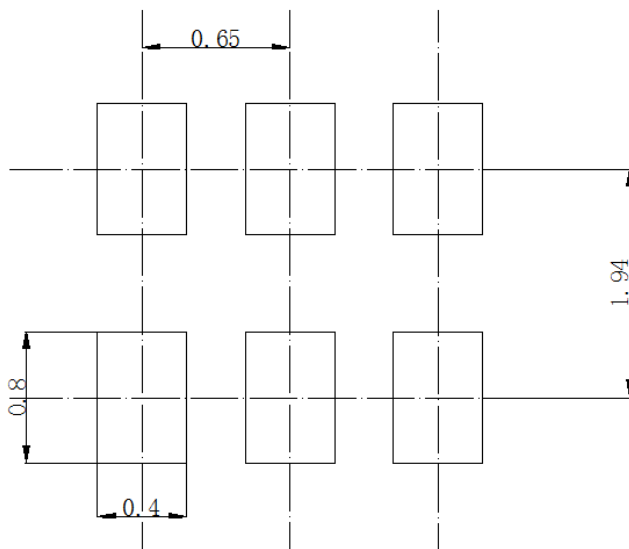
## ■SOT-363 Package Outline Dimensions



DIM	DIMENSIONS			
	INCHES		MM	
	MIN	MAX	MIN	MAX
A	0.035	0.043	0.9	1.1
A1	0	0.004	0	0.1
A2	0.035	0.039	0.9	1
b	0.006	0.014	0.15	0.35
c	0.002	0.01	0.05	0.25
D	0.071	0.087	1.8	2.2
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	1.2	1.4
L	0.021Typ		0.525Typ	
L1	0.01	0.018	0.26	0.46
φ	0°	8°	0°	8°



## ■SOT-363 Soldering Footprint



Unit: mm



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