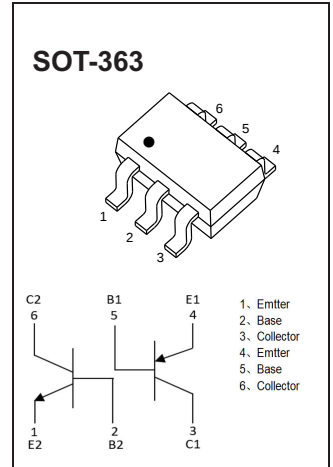


Features

- Epoxy meets UL-94 V-0 flammability rating
- Surface mount package ideally Suited for Automatic Insertion
- NPN/PNP
- Compliant to Halogen-free
- Suffix "-Q1" for AEC-Q101

Mechanical Data

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



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

Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	75	V
V_{CEO}	Collector-Emitter Voltage	40	V
V_{EBO}	Emitter-Base Voltage	6	V
I_C	Collector Current -Continuous	0.6	A
P_C	Collector Power Dissipation	0.2	W
T_J	Junction Temperature	150	°C
T_{stg}	Storage Temperature	-55~+150	°C

TR1 NPN Pin1、2、6 Electrical Characteristics (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 10\mu A, I_E = 0$	75		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 10mA, I_B = 0$	40		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 10\mu A, I_C = 0$	6		V
Collector cut-off current	I_{CBO}	$V_{CB} = 60V, I_E = 0$		10	nA
Collector cut-off current	I_{CEX}	$V_{CE} = 60V, V_{EB(OFF)} = 3V$		10	nA
Emitter cut-off current	I_{EBO}	$V_{EB} = 3V, I_C = 0$		10	nA
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	$V_{CE(sat)1}$	$I_C = 150mA, I_B = 15mA$		0.3	V
	$V_{CE(sat)2}$	$I_C = 500mA, I_B = 50mA$		1.0	V
Base-emitter saturation voltage	$V_{BE(sat)1}$	$I_C = 150mA, I_B = 15mA$		1.2	V
	$V_{BE(sat)2}$	$I_C = 500mA, I_B = 50mA$		2.0	V
Transition frequency	f_T	$V_{CE} = 20V, I_C = 20mA, f = 100MHz$	300		MHz
Delay time	t_d	$V_{CC} = 30V, I_C = 150mA, I_{B1} = 15mA, V_{BE(off)} = -0.5V$		10	nS
Rise time	t_r			25	nS
Storage time	t_s			225	nS
Fall time	t_f	$I_{B1} = -I_{B2} = 5mA$		60	nS

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

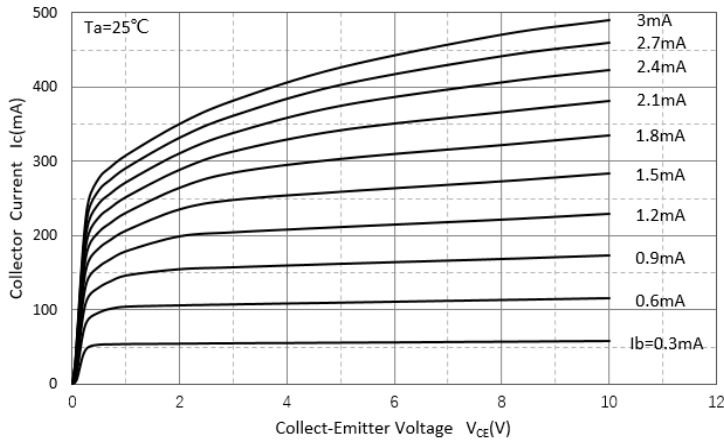
Symbol	Parameter	Value	Units
V_{CBO}	Collector-Base Voltage	-60	V
V_{CEO}	Collector-Emitter Voltage	-60	V
V_{EBO}	Emitter-Base Voltage	-5	V
I_C	Collector Current -Continuous	-0.6	A
P_C	Collector Power Dissipation	0.2	W
T_J	Junction Temperature	150	°C
T_{stg}	Storage Temperature	-55~+150	°C

TR2 PNP Pin3、4、5 Electrical Characteristics (Ta=25°C unless otherwise specified)

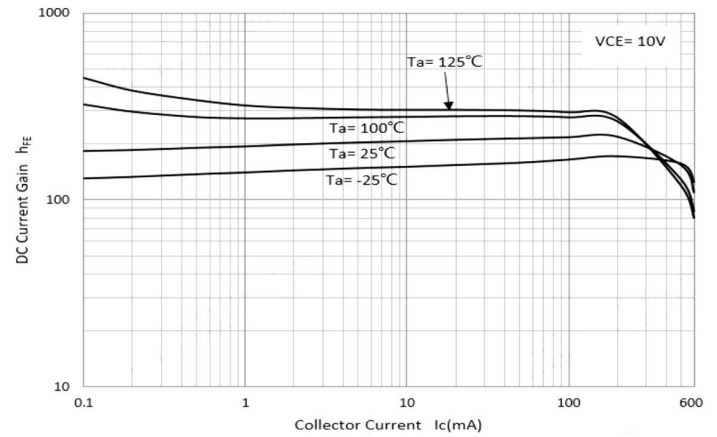
Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = -10\mu A, I_E = 0$	-60		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = -10mA, I_B = 0$	-60		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = -10\mu A, I_C = 0$	-5		V
Collector cut-off current	I_{CBO}	$V_{CB} = -50V, I_E = 0$		-10	nA
Collector cut-off current	I_{CEX}	$V_{CE} = -30V, V_{EB(OFF)} = -0.5V$		-50	nA
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	$V_{CE(sat)1}$	$I_C = -150mA, I_B = -15mA$		-0.4	V
	$V_{CE(sat)2}$	$I_C = -500mA, I_B = -50mA$		-1.6	V
Base-emitter saturation voltage	$V_{BE(sat)1}$	$I_C = -150mA, I_B = -15mA$		-1.3	V
	$V_{BE(sat)2}$	$I_C = -500mA, I_B = -50mA$		-2.6	V
Transition frequency	f_T	$V_{CE} = -20V, I_C = -50mA, f = 100MHz$	200		MHz
Delay time	t_d	$V_{CC} = -30V, I_C = -150mA, I_{B1} = -15mA$		10	nS
Rise time	t_r			40	nS
Storage time	t_s	$V_{CC} = -6V, I_C = -150mA, I_{B1} = -I_{B2} = -15mA$		225	nS
Fall time	t_f			60	nS

TR1 NPN Pin1、2、6 Characteristics (Typical)

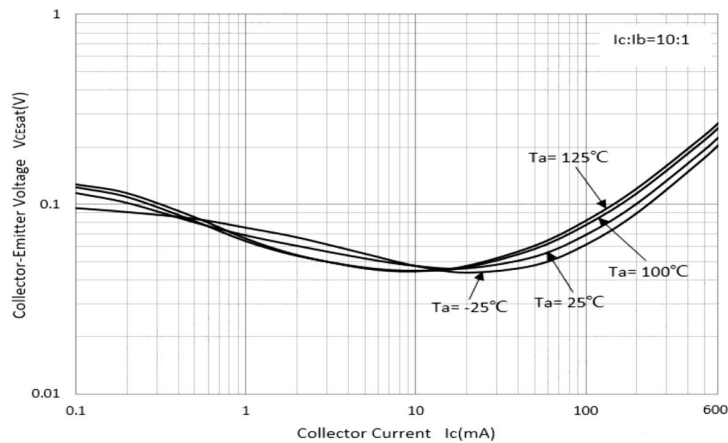
Static Characteristic



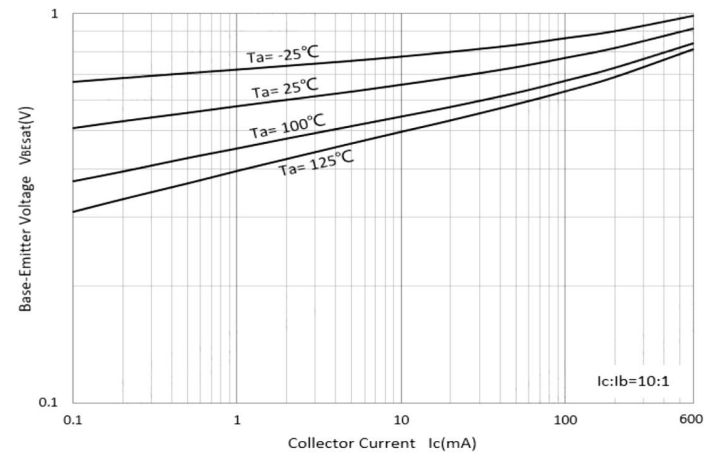
DC Current Gain



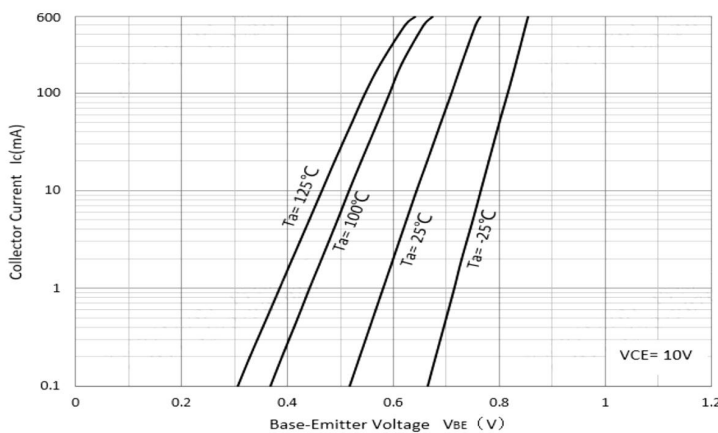
Collector-Emitter Saturation Voltage



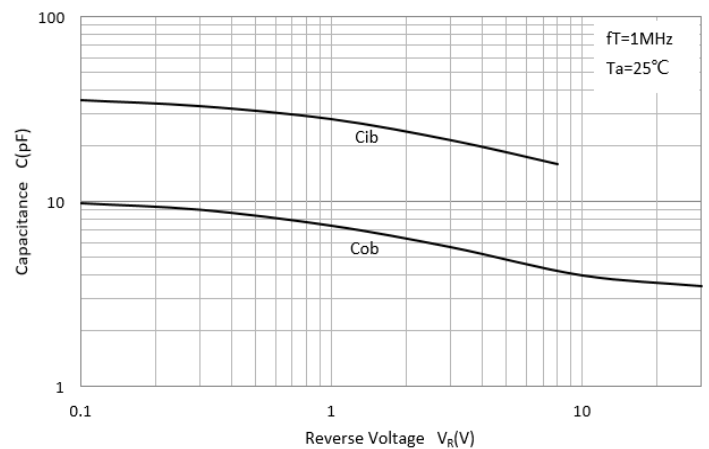
Base-Emitter Saturation Voltage



Base-Emitter On Voltage

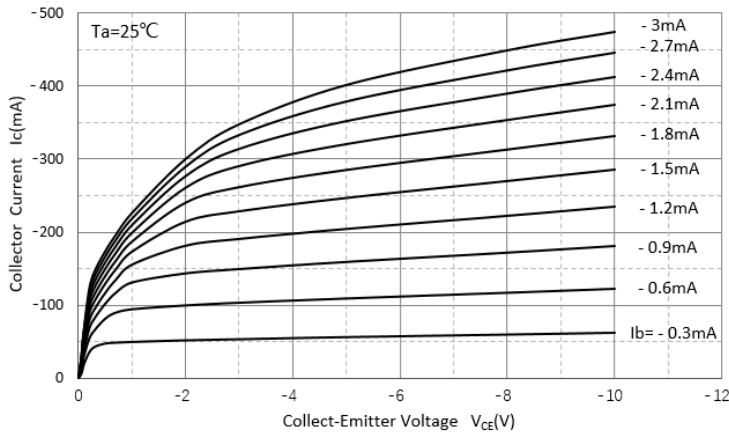


$C_{ob}/C_{ib}-V_{CB}/V_{EB}$

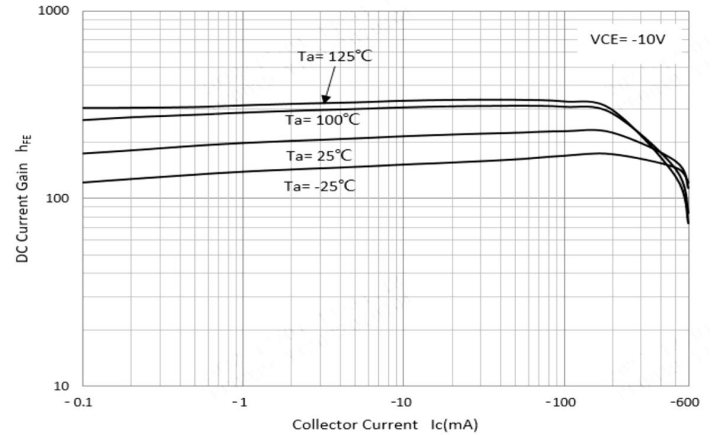


TR2 PNP Pin3、4、5 Characteristics (Typical)

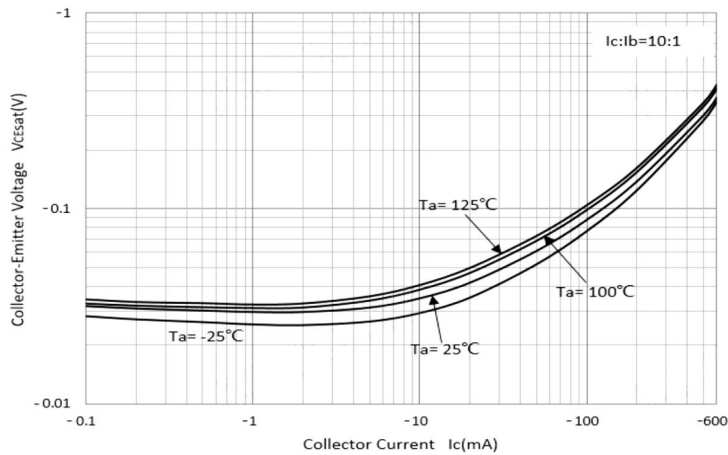
Static Characteristic



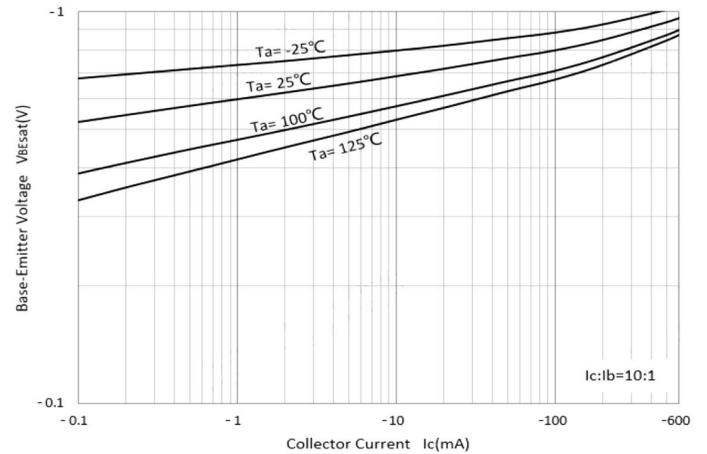
DC Current Gain



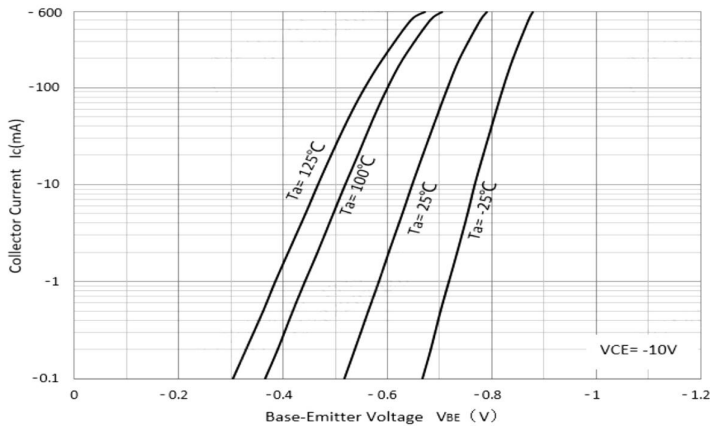
Collector-Emittor Saturation Voltage



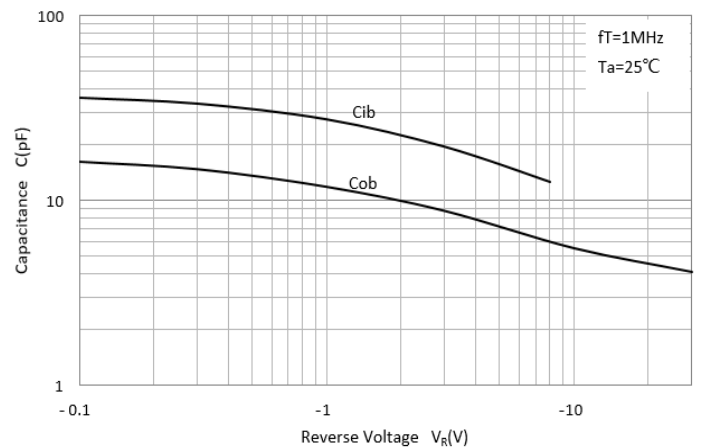
Base-Emittor Saturation Voltage



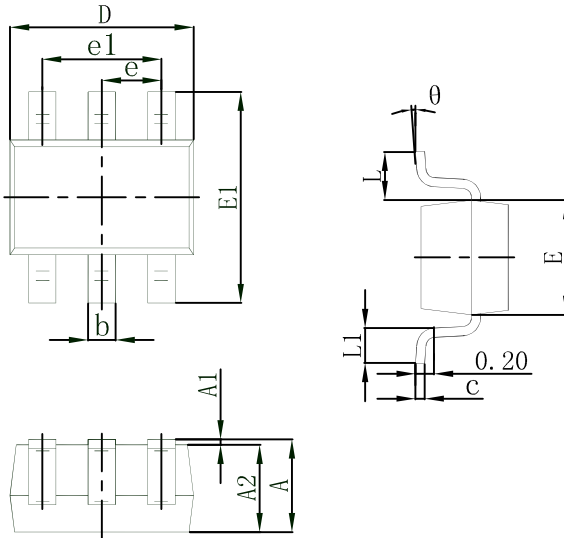
Base-Emittor On Voltage



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

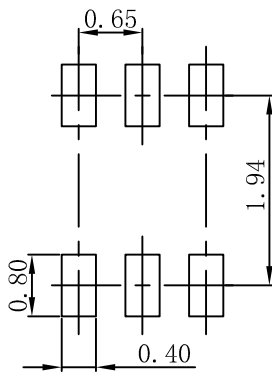


Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.850	1.000	0.033	0.039
b	0.150	0.350	0.006	0.014
c	0.050	0.250	0.002	0.010
D	1.800	2.200	0.071	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP.		0.026 TYP.	
e1	1.200	1.400	0.047	0.055
L	0.525 TYP.		0.021 TYP.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

Soldering Footprint



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.