

COMPLEMENTARY DUAL SMALL SIGNAL SURFACE MOUNT TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Ideally Suited for Automated Assembly Processes
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **“Green” Device (Note 2)**
- **Ultra Small Package**

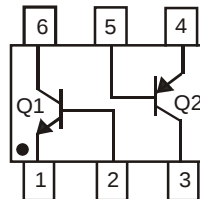
Mechanical Data

- Case: SOT-963
- Case Material: Molded Plastic, “Green” Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.0027 grams (approximate)

SOT-963



Top View



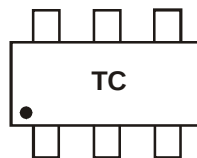
Device Schematic

Ordering Information

Device	Packaging	Shipping
DST847BPDP6-7	SOT-963	10,000/Tape & Reel

Notes: 1. No purposefully added lead. Halogen and Antimony Free.
2. Diodes Inc's “Green” Policy can be found on our website at <http://www.diodes.com>

Marking Information



TC = Product Type Marking Code

Maximum Ratings @T_A = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V _{CBO}	50(-50)	V
Collector-Emitter Voltage	V _{CEO}	45(-45)	V
Emitter-Base Voltage	V _{EB0}	6.0(-5.0)	V
Collector Current - Continuous (Note 3)	I _C	100 (-100)	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3)	P _D	250	mW
Thermal Resistance, Junction to Ambient (Note 3)	R _{θJA}	500	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Notes: 3. Device mounted on FR-4 PCB with minimum recommended pad layout.

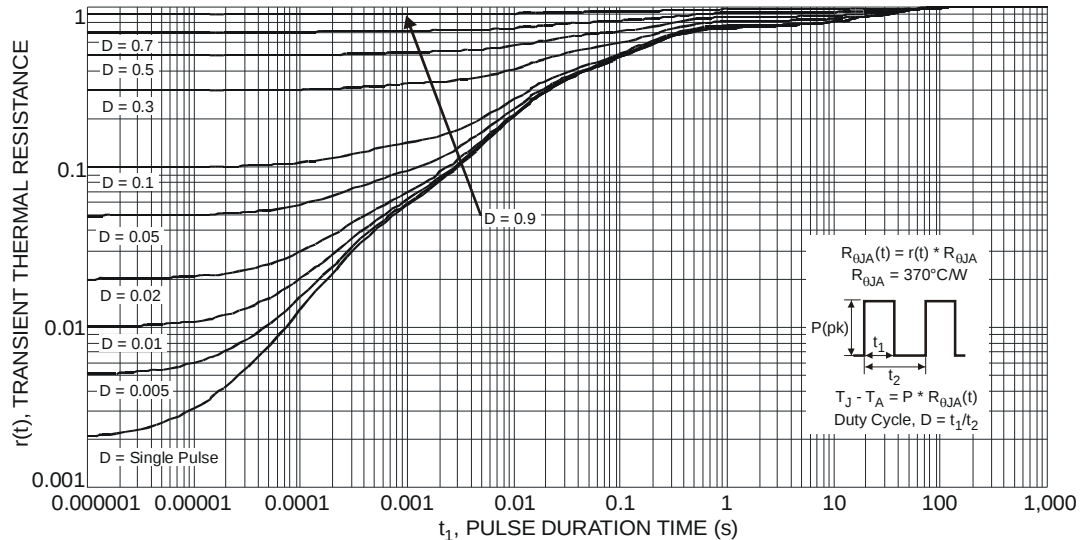


Fig. 1 Transient Thermal Response

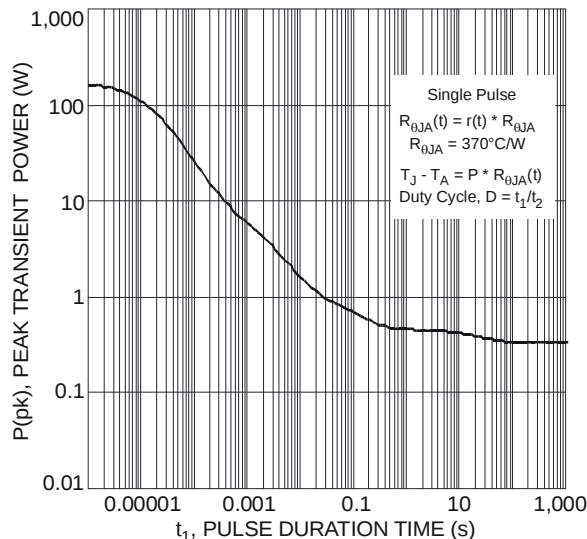


Fig. 2 Single Pulse Maximum Power Dissipation

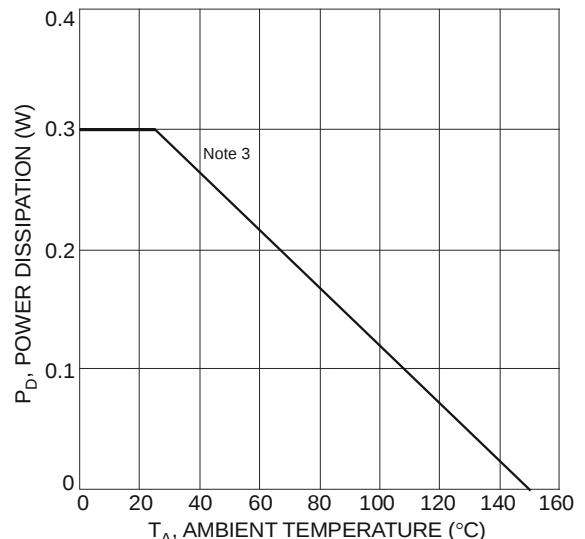


Fig. 3 Power Dissipation vs. Ambient Temperature

Electrical Characteristics – Q1 NPN Transistor @T_A = 25°C unless otherwise specified

Characteristic (Note 4)	Symbol	Min	Typical	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	V _{(BR)CBO}	50	150	-	V	I _C = 10μA, I _B = 0
Collector-Emitter Breakdown Voltage	V _{(BR)CES}	50	150	-	V	I _C = 10μA, I _B = 0
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	45	65	-	V	I _C = 1mA, I _B = 0
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	6	8.35	-	V	I _E = 1μA, I _C = 0
Collector-Base Cutoff Current	I _{CBO}	-	-	15	nA	V _{CB} = 30V
DC Current Gain	h _{FE}	100 200	220 300	- 470	-	I _C = 10μA, V _{CE} = 5V I _C = 2.0mA, V _{CE} = 5V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	- -	50 122	125 300	mV	I _C = 10mA, I _B = 0.5mA I _C = 100mA, I _B = 5.0mA
Base-Emitter Saturation Voltage	V _{BE(sat)}	- -	760 880	1000 1100	mV	I _C = 10mA, I _B = 0.5mA I _C = 100mA, I _B = 5.0mA
Base-Emitter Voltage	V _{BE(on)}	580	650 725	750 800	mV	I _C = 2.0mA, V _{CE} = 5V I _C = 10mA, V _{CE} = 5V
Current Gain-Bandwidth Product	f _T	100	175	-	MHz	V _{CE} = 5V, I _C = 10mA, f = 100MHz
Collector-Base Capacitance	C _{cbo}	-	1.5	-	pF	V _{CB} = 10V, f = 1.0MHz

Notes: 4. Short duration pulse test used to minimize self-heating effect

Typical Characteristics – Q1 NPN Transistor

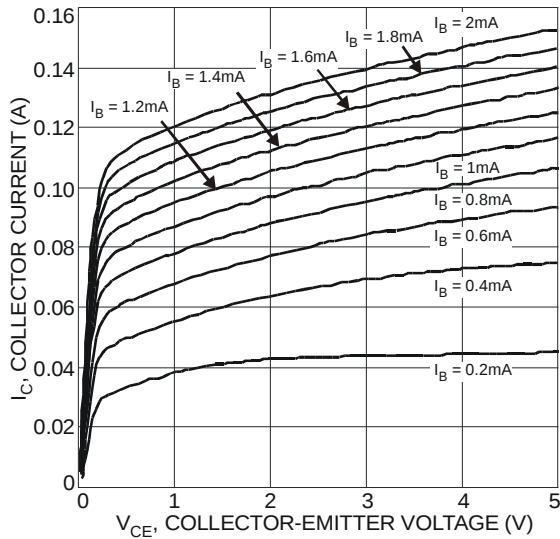


Fig. 4 Typical Collector Current vs. Collector-Emitter Voltage

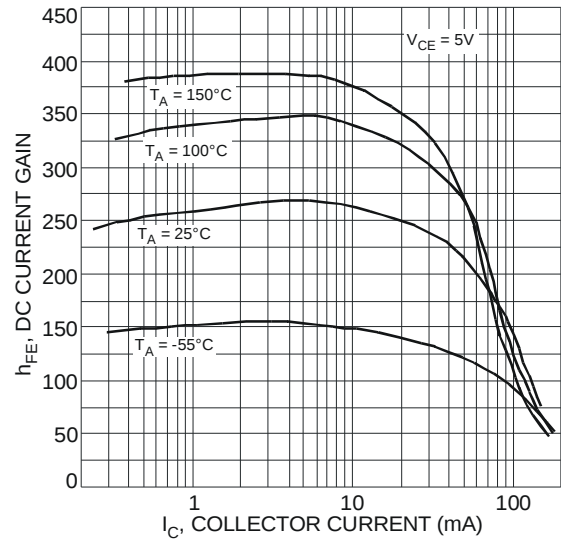


Fig. 5 Typical DC Current Gain vs. Collector Current

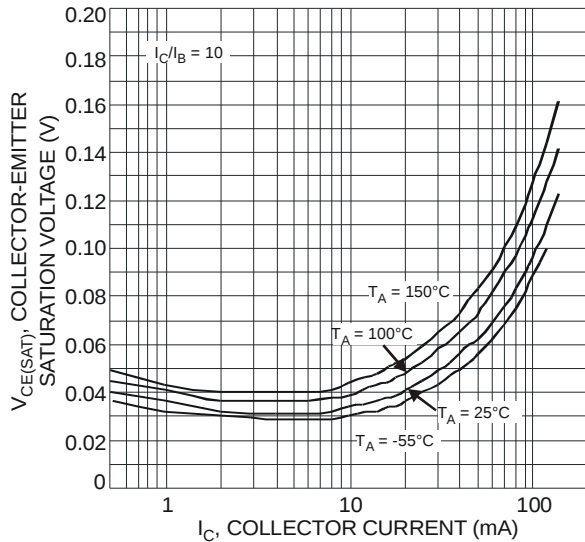


Fig. 6 Typical Collector-Emitter Saturation Voltage vs. Collector Current

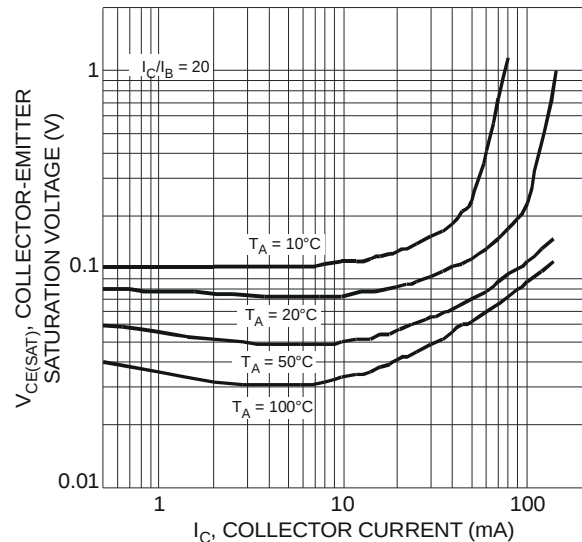


Fig. 7 Typical Collector-Emitter Saturation Voltage vs. Collector Current

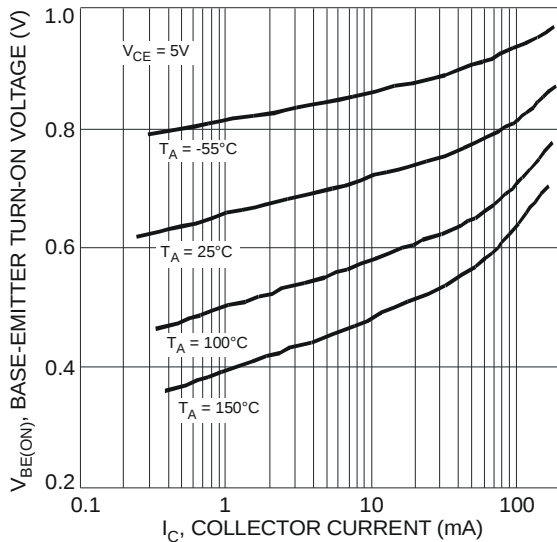


Fig. 8 Typical Base-Emitter Turn-On Voltage vs. Collector Current

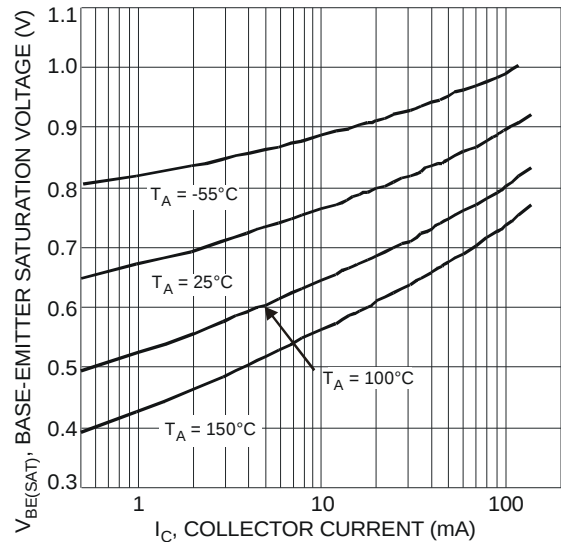


Fig. 9 Typical Base-Emitter Saturation Voltage vs. Collector Current

Electrical Characteristics – Q2 PNP Transistor @T_A = 25°C unless otherwise specified

Characteristic (Note 4)	Symbol	Min	Typical	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	V _{(BR)CBO}	-50	-100	-	V	I _C = -10μA, I _B = 0
Collector-Emitter Breakdown Voltage	V _{(BR)CES}	-50	-90	-	V	I _C = -10μA, I _B = 0
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	-45	-65	-	V	I _C = -1mA, I _B = 0
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	-6	-8.5	-	V	I _E = -1μA, I _C = 0
Collector Cutoff Current	I _{CBO}	-	-	-15	nA	V _{CB} = -30V
DC Current Gain	h _{FE}	100 200	340 330	- 470	-	I _C = -10μA, V _{CE} = -5V I _C = -2.0mA, V _{CE} = -5V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	- -	-70 -300	-175 -500	mV	I _C = -10mA, I _B = -0.5mA I _C = -100mA, I _B = -5.0mA
Base-Emitter Saturation Voltage	V _{BE(sat)}	- -	-760 -885	-1000 -1100	mV	I _C = -10mA, I _B = -0.5mA I _C = -100mA, I _B = -5.0mA
Base-Emitter Voltage	V _{BE(on)}	-600 -	-670 -715	-780 -850	mV	I _C = -2.0mA, V _{CE} = -5V I _C = -10mA, V _{CE} = -5V
Current Gain-Bandwidth Product	f _T	100	340	-	MHz	V _{CE} = -5V, I _C = -10mA, f = 100MHz
Output Capacitance	C _{obo}	-	2.0	-	pF	V _{CB} = -10V, f = 1.0MHz

Notes: 4. Short duration pulse test used to minimize self-heating effect.

Typical Characteristics – Q2 PNP Transistor

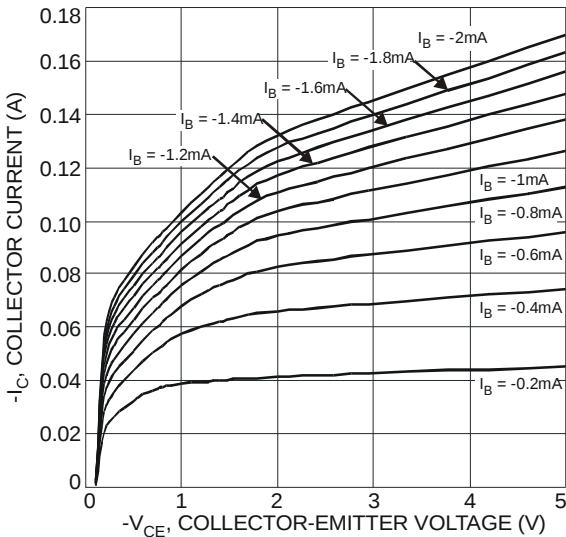


Fig. 10 Typical Collector Current vs. Collector-Emitter Voltage

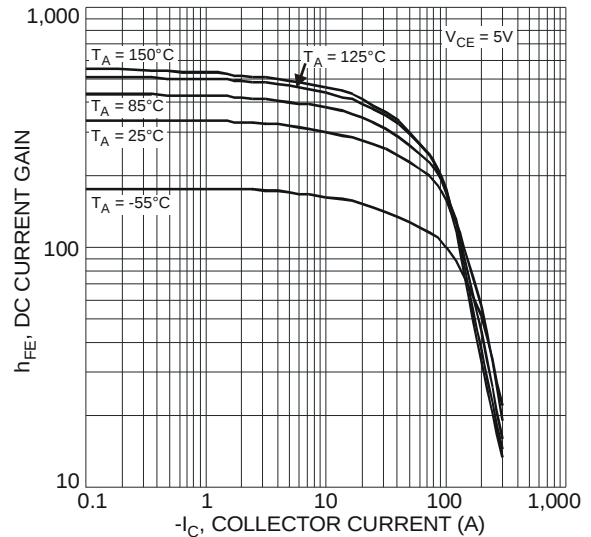


Fig. 11 Typical DC Current Gain vs. Collector Current

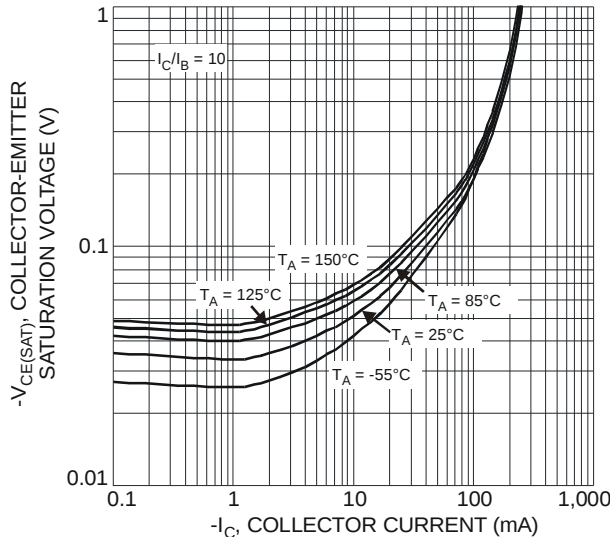


Fig. 12 Typical Collector-Emitter Saturation Voltage vs. Collector Current

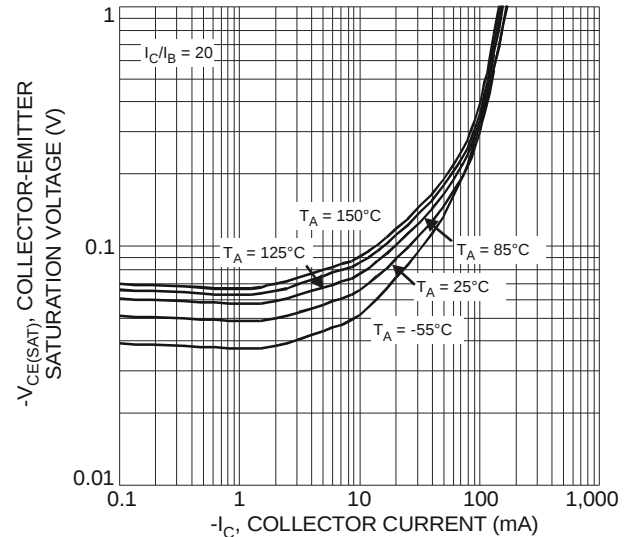


Fig. 13 Typical Collector-Emitter Saturation Voltage vs. Collector Current

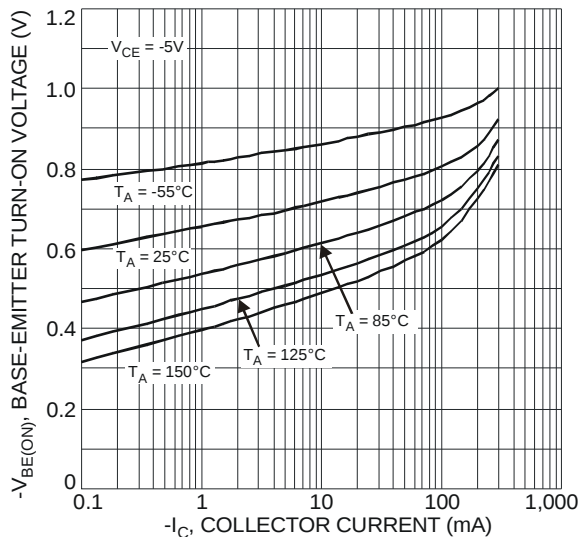


Fig. 14 Typical Base-Emitter Turn-On Voltage vs. Collector Current

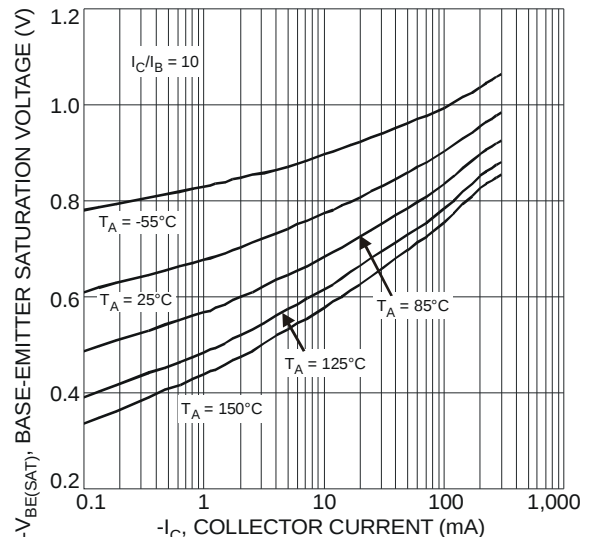
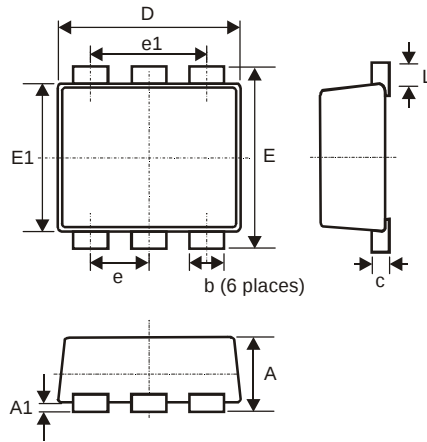


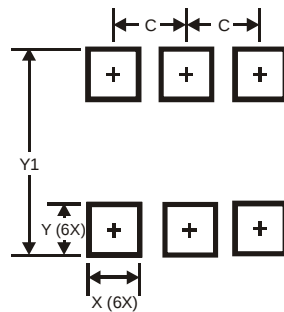
Fig. 15 Typical Base-Emitter Saturation Voltage vs. Collector Current

Package Outline Dimensions



SOT-963			
Dim	Min	Max	Typ
A	0.40	0.50	0.45
A1	0	0.05	-
C	0.120	0.180	0.150
D	0.95	1.05	1.00
E	0.95	1.05	1.00
E1	0.75	0.85	0.80
L	0.05	0.15	0.10
b	0.10	0.20	0.15
e	0.35 Typ		
e1	0.70 Typ		
All Dimensions in mm			

Suggest Pad Layout



Dimensions	Value (in mm)
C	0.350
X	0.200
Y	0.200
Y1	1.100

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