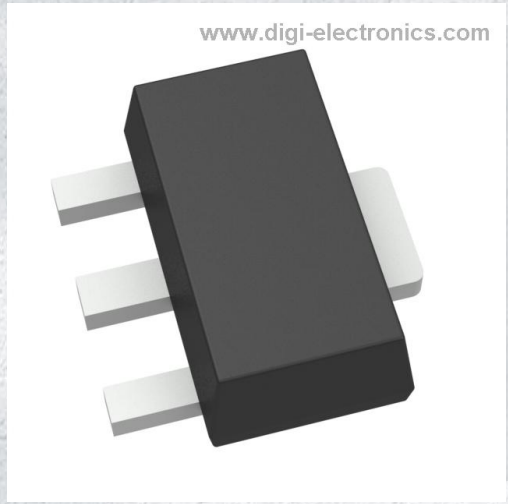
2DD1766R-13 Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	2DD1766R-13-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	2DD1766R-13
Description	TRANS NPN 32V 2A SOT89-3
Detailed Description	Bipolar (BJT) Transistor NPN 32 V 2 A 220MHz 1 W Surface Mount SOT-89-3

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
2DD1766R-13	Diodes Incorporated
Series:	Product Status:
-	Obsolete
Transistor Type:	Current - Collector (Ic) (Max):
NPN	2 A
Voltage - Collector Emitter Breakdown (Max):	Vce Saturation (Max) @ Ib, Ic:
32 V	800mV @ 200mA, 2A
Current - Collector Cutoff (Max):	DC Current Gain (hFE) (Min) @ Ic, Vce:
1µA (ICBO)	180 @ 500mA, 3V
Power - Max:	Frequency - Transition:
1 W	220MHz
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Package / Case:	Supplier Device Package:
TO-243AA	SOT-89-3
Base Product Number:	
2DD1766	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.29.0075	

THE 2DD1766P/Q ARE OBSOLETE.
PLEASE USE THE FCX491TA.
THE 2DD1766R IS OBSOLETE.
PLEASE USE THE FCX491ATA.

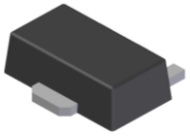
Lead-free Green

2DD1766P/Q/R

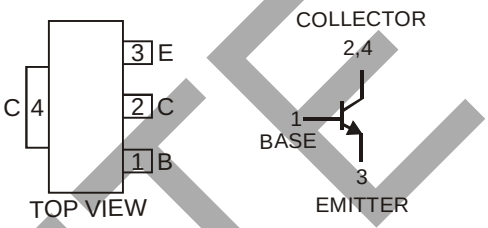
NPN SURFACE MOUNT TRANSISTOR

Features

- Epitaxial Planar Die Construction
- Complementary PNP Type Available (2DB1188)
- Ideally Suited for Automated Assembly Processes
- Ideal for Medium Power Switching or Amplification Applications
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The 2DD1766P/Q/R are suitable for automotive applications requiring specific change control; these parts are AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/



SOT89-3L



Schematic and Pin Configuration

Mechanical Data

- Package: SOT89-3L
- Package 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 (Lead Free Plating). Solderable per MIL-STD-202, Method 208 e3
- Marking & Type Code Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.072 grams (Approximate)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	40	V
Collector-Emitter Voltage	V_{CEO}	32	V
Emitter-Base Voltage	V_{EBO}	5	V
Peak Pulse Current	I_{CM}	2.5	A
Continuous Collector Current	I_C	2	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4) @ T_A = +25°C	P_D	1	W
Thermal Resistance, Junction to Ambient Air (Note 4) @ T_A = +25°C	$R_{\theta JA}$	125	°C/W
Operating and Storage Temperature Range	T_j, T_{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Min	Typ	Max	Unit	Conditions
OFF CHARACTERISTICS (Note 5)							
Collector-Base Breakdown Voltage		$V_{(BR)CBO}$	40	—	—	V	I_C = 50μA, I_E = 0
Collector-Emitter Breakdown Voltage		$V_{(BR)CEO}$	32	—	—	V	I_C = 1mA, I_B = 0
Emitter-Base Breakdown Voltage		$V_{(BR)EBO}$	5	—	—	V	I_E = 50μA, I_C = 0
Collector Cut-Off Current		I_{CBO}	—	—	1	μA	V_{CB} = 20V, I_E = 0
Emitter Cut-Off Current		I_{EBO}	—	—	1	μA	V_{EB} = 4V, I_C = 0
ON CHARACTERISTICS (Note 5)							
Collector-Emitter Saturation Voltage		$V_{CE(SAT)}$	—	0.3	0.8	V	I_C = 2A, I_B = 0.2A
DC Current Gain	2DD1766P	h_{FE}	82	—	180	—	V_{CE} = 3V, I_C = 0.5A
	2DD1766Q		120	—	270	—	
	2DD1766R		180	—	390	—	
SMALL SIGNAL CHARACTERISTICS							
Transition Frequency		f_T	—	220	—	MHz	V_{CE} = 5V, I_E = -50mA, f = 100MHz
Output Capacitance		C_{ob}	—	13	—	pF	V_{CB} = 10V, I_E = 0, f = 1MHz

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. Device mounted on FR-4 PCB; pad layout as shown on page 4 or in Incorporated's suggested pad layout document, which can be found on our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.
5. Measured under pulsed conditions. Pulse width = 300μs. Duty cycle ≤ 2%.

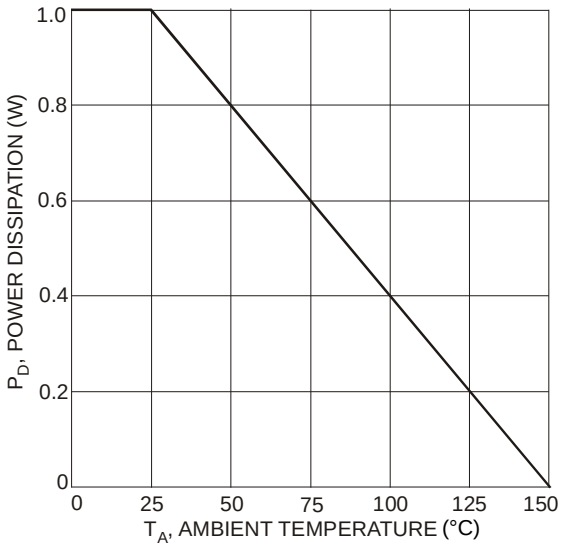


Fig. 1 Power Dissipation vs. Ambient Temperature (Note 4)

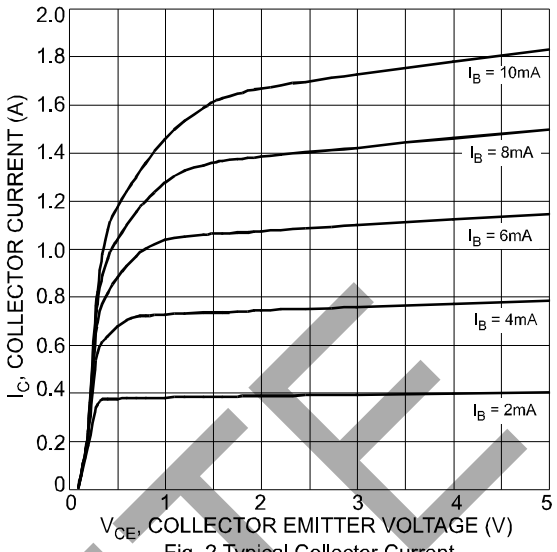


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

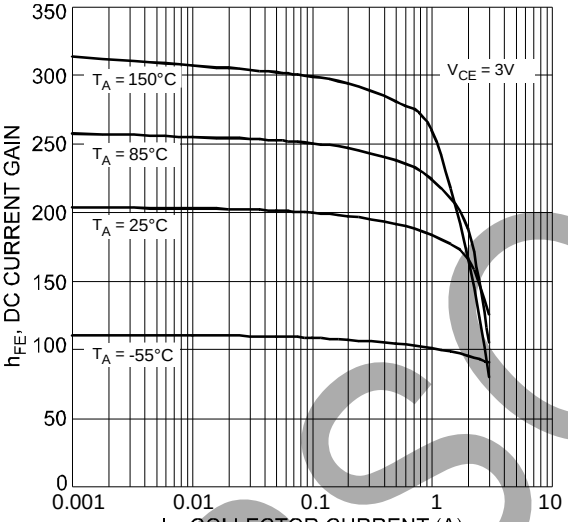


Fig. 3 Typical DC Current Gain vs. Collector Current (2DD1766Q)

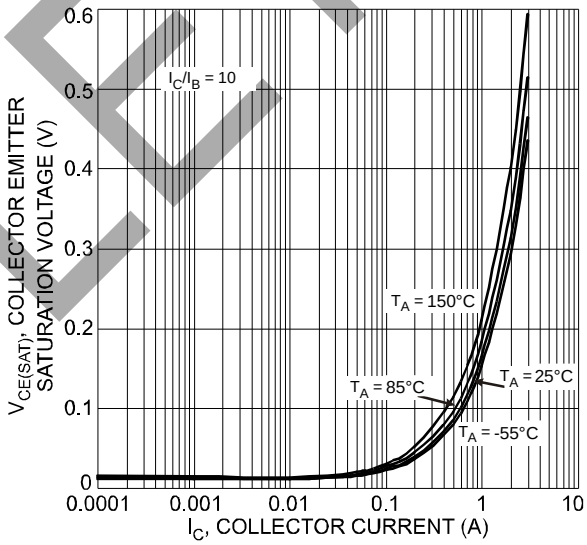


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

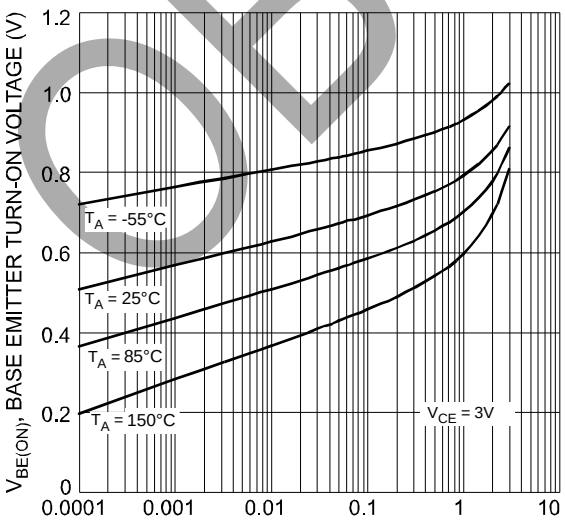


Fig. 5 Typical Base-Emitter Turn-On Voltage vs. Collector Current

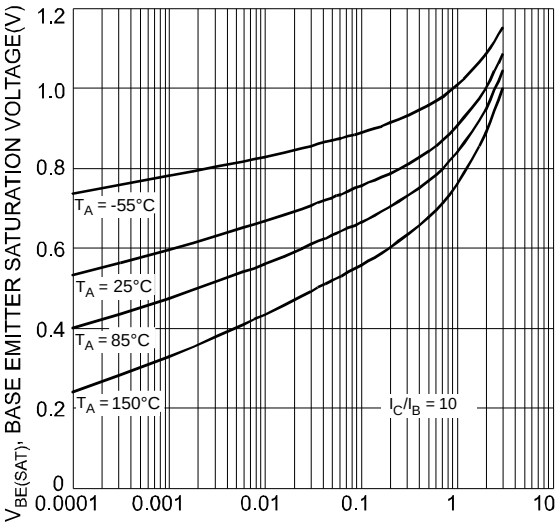


Fig. 6 Typical Base-Emitter Saturation Voltage vs. Collector Current

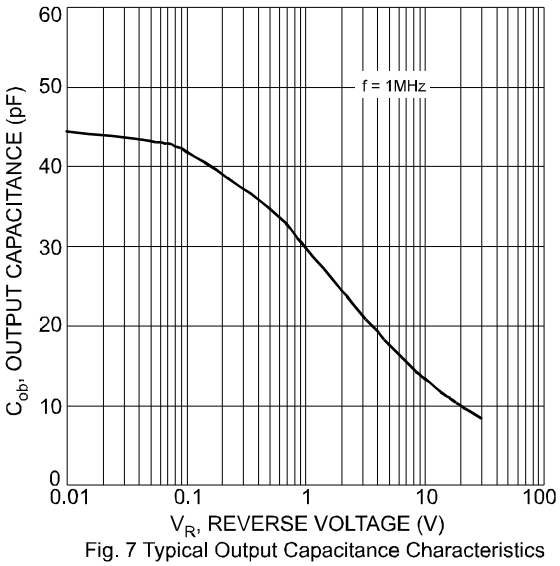


Fig. 7 Typical Output Capacitance Characteristics

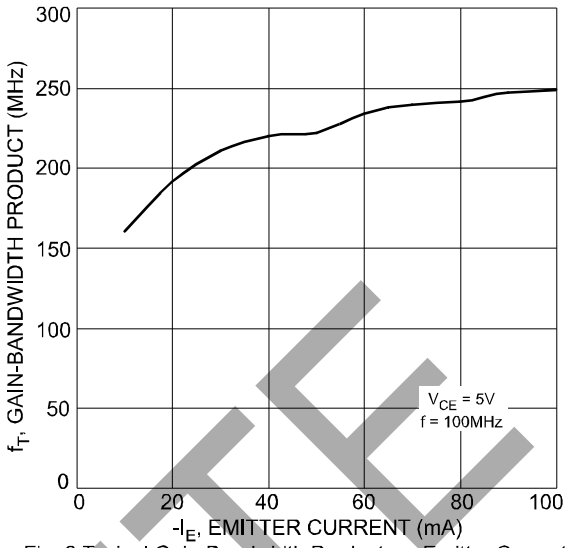


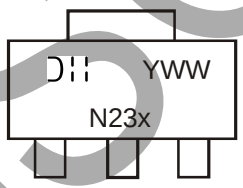
Fig. 8 Typical Gain-Bandwidth Product vs. Emitter Current

Ordering Information (Note 6)

Part Number	Package	Packing	
		Qty.	Carrier
2DD1766P-13	SOT89-3L	2500	Tape & Reel
2DD1766Q-13	SOT89-3L	2500	Tape & Reel
2DD1766R-13	SOT89-3L	2500	Tape & Reel

Note: 6. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information

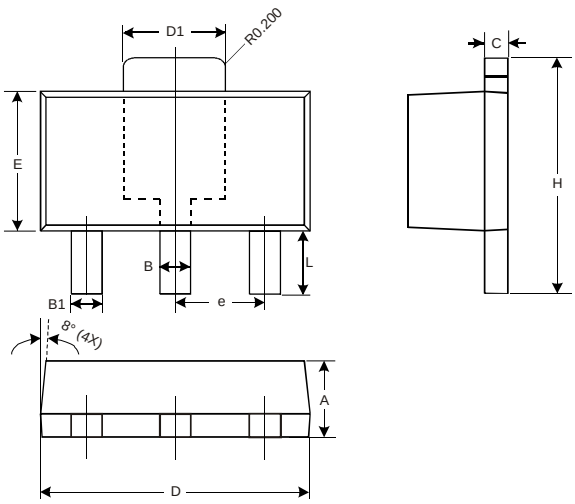


N23x = Product Type Marking Code:
Where N23P = 2DD1766P
N23Q = 2DD1766Q
N23R = 2DD1766R
YWW = Date Code Marking
Y = Last Digit of Year ex: 4 = 2024
WW = Week Code 01 - 52

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT89-3L

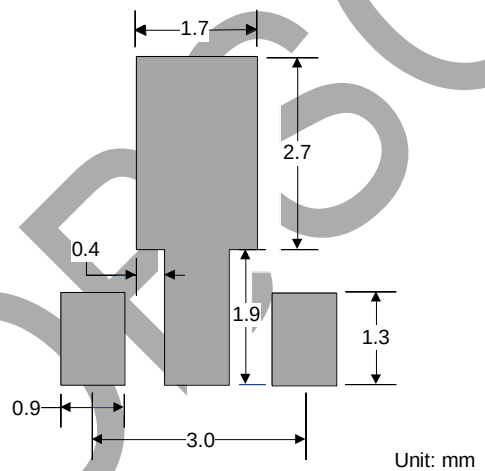


SOT89-3L			
Dim	**Min**	**Max**	**Typ**
A	1.40	1.60	1.50
B	0.45	0.55	0.50
B1	0.37	0.47	0.42
C	0.35	0.43	0.38
D	4.40	4.60	4.50
D1	1.50	1.70	1.60
E	2.40	2.60	2.50
e	—	—	1.50
H	3.95	4.25	4.10
L	0.90	1.20	1.05
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT89-3L



Unit: mm

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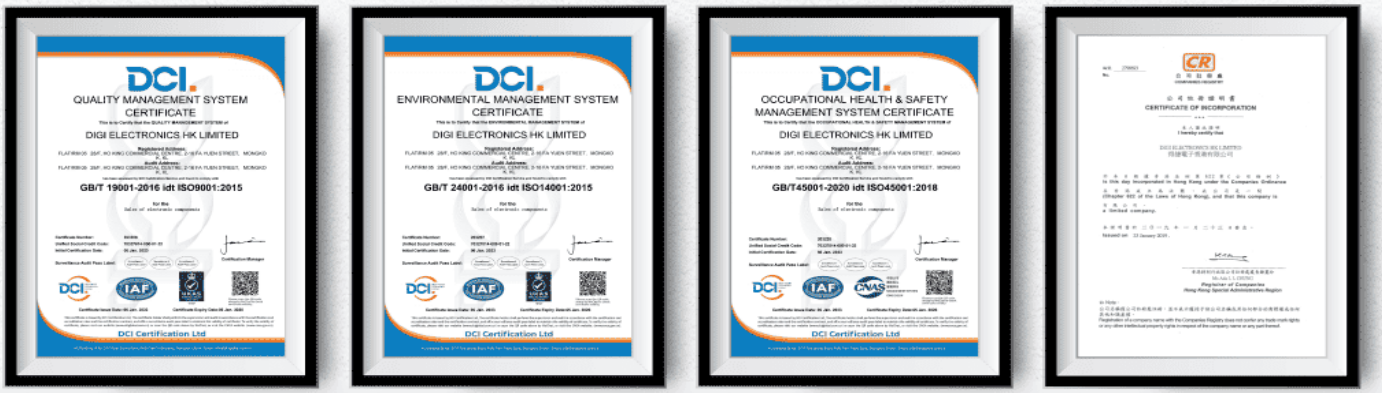

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