

NPN SILICON PLASTIC POWER TRANSISTOR

MJD13003

DPAK (TO-252)
Plastic Package



PIN CONFIGURATION
1. BASE
2. COLLECTOR
3. EMITTER

Designed for High Voltage, High Speed Power Switching Inductive Circuits Applications

ABSOLUTE MAXIMUM RATINGS

DESCRIPTION	SYMBOL	VALUE	UNIT
Collector Emitter Voltage	V_{CEO}	400	V
Collector Emitter Voltage	V_{CEV}	700	V
Emitter Base Voltage	V_{EBO}	9.0	V
Collector Current Continuous	I_C	1.5	A
Peak	* I_{CM}	3.0	A
Base Current Continuous	I_B	0.75	A
Peak	* I_{BM}	1.5	A
Emitter Current Continuous	I_E	2.25	A
Peak	* I_{EM}	4.5	A
Total Power Dissipation at $T_a=25^\circ\text{C}$	** P_D	1.56	W
Derate Above 25°C		0.0125	W/ $^\circ\text{C}$
Total Power Dissipation at $T_c=25^\circ\text{C}$	P_D	15	W
Derate Above 25°C		0.12	W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_j, T_{stg}	- 65 to +150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Junction to Case	$R_{th(j-c)}$	8.33	$^\circ\text{C}/\text{W}$
Junction to Ambient in free air	** $R_{th(j-a)}$	80	$^\circ\text{C}/\text{W}$
Maximum Lead Temperature for Soldering Purposes	T_L	260	$^\circ\text{C}$

*Pulse Test:- Pulse Width=5ms, Duty Cycle $\leq 10\%$

** When Surface Mounted on Minimum Pad Sizes Recommended

ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$ unless specified otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Emitter Voltage	V_{CEO}	$I_C=1\text{mA}, I_B=0$	400			V
Collector Cut Off Current	I_{CEV}	$V_{CEV}=\text{Rated Value}, V_{BE(off)}=1.5\text{V}$ $V_{CEV}=\text{Rated Value}, V_{BE(off)}=1.5\text{V}, T_c=100^\circ\text{C}$			0.1 2.0	mA mA
Emitter Cut Off Current	I_{EBO}	$V_{EB}=9\text{V}, I_C=0$			1.0	mA
DC Current Gain	*** h_{FE}	$I_C=0.5\text{A}, V_{CE}=2\text{V}$ $I_C=1\text{A}, V_{CE}=2\text{V}$	8.0 5.0		40 25	

***Pulse Test:- Pulse Width $\leq 300\text{ms}$, Duty Cycle $\leq 2\%$

MJD13003Rev160506E



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ELECTRICAL CHARACTERISTICS (T_c=25°C unless specified otherwise)

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Collector Emitter Saturation Voltage	***V _{CE(sat)}	I _C =0.5A, I _B =0.1A			0.5	V
		I _C =1A, I _B =0.25A			1.0	V
		I _C =1.5A, I _B =0.5A			3.0	V
		I _C =1A, I _B =0.25A, T _C =100°C			1.0	V
Base Emitter Saturation Voltage	***V _{BE(sat)}	I _C =0.5A, I _B =0.1A			1.0	V
		I _C =1A, I _B =0.25A			1.2	V
		I _C =1A, I _B =0.25A, T _C =100°C			1.1	V

DYNAMIC CHARACTERISTICS

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Current Gain Bandwidth Product	f _T	I _C =100mA, V _{CE} =10V, f=1MHz	4.0			MHz
Output Capacitance	C _{ob}	V _{CB} =10V, I _E =0V, f=0.1MHz		21		pF

Resistive Load

Delay Time	t _d	V _{CC} =125V, I _C =1A, I _{B1} =I _{B2} =0.2A, t _p =25µs, Duty Cycle 1%			0.1	µs
Rise Time	t _r				1.0	µs
Storage Time	t _s				4.0	µs
Fall Time	t _f				0.7	µs

Inductive Load, Clamped

Voltage Storage Time	t _{sv}	V _{Clamp} =300V, I _C =1A, I _{B1} =0.2A, V _{BE(off)} =5V, T _c =100°C			4.00	µs
Crossover Time	t _C				0.75	µs
Fall Time	t _{fi}			0.15		µs

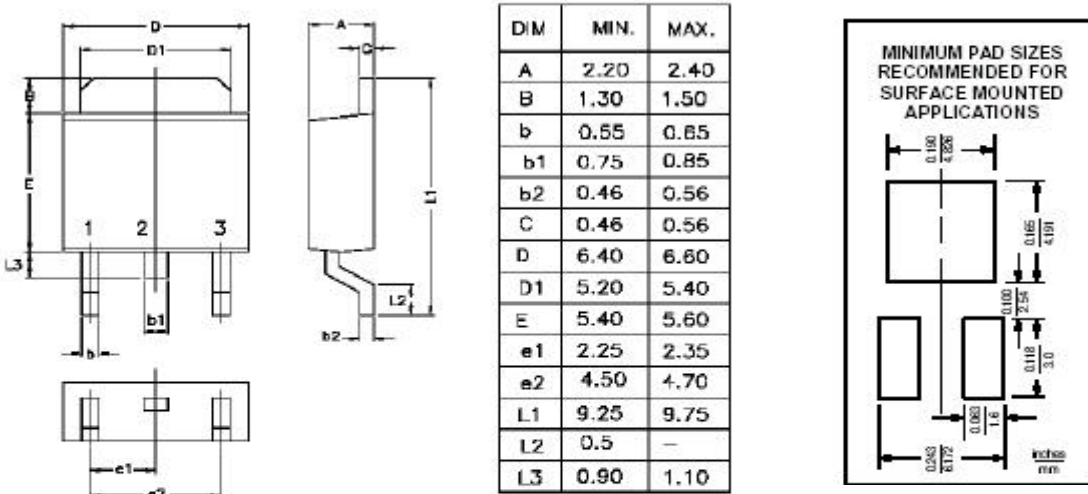
Second Breakdown Characteristics

DESCRIPTION	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Second Breakdown Collector Current with Base Forward Biased	I _{S/b}	V _{CE} =100V, t=1.0 sec	0.15			A

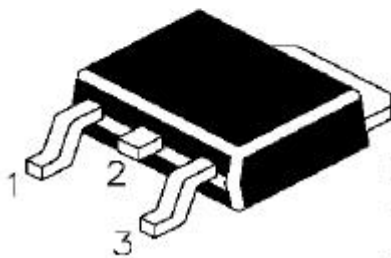
MARKING	CDIL MJD13003 XY MX	
XY= Date Code		

***Pulse Test:- Pulse Width ≤ 300µs, Duty Cycle ≤ 2%

DPAK PACKAGE OUTLINE DIMENSIONS



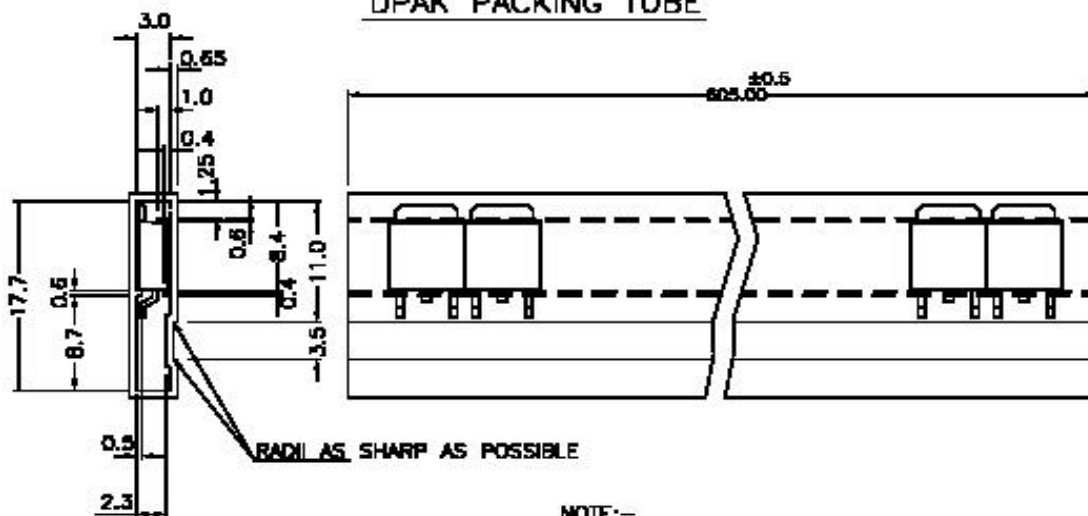
ALL DIMENSIONS ARE IN mm



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DPAK PACKING TUBE



NOTE:—
80 Pcs/TUBE
2.5 K/REEL
ALL DIMENSIONS ARE IN mm

Component Disposal Instructions

1. CDIL Semiconductor Devices are RoHS compliant, customers are requested to please dispose as per prevailing Environmental Legislation of their Country.
2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

Disclaimer

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