



DRDNB21D

#### COMPLEX ARRAY FOR DUAL RELAY DRIVER

# **Features and Benefits**

- **Epitaxial Planar Die Construction**
- Two Pre-Biased Transistors and Two Switching Diodes, . Internally Connected in One Package
- Ideally Suited for Automated Assembly Processes
- Lead Free By Design/RoHS Compliant (Note 1)
- "Green" Device (Note 2)
- Qualified to AEC-Q101 standards for High Reliability

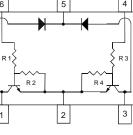
$R1 = R3 = 2.2k\Omega$ (nominal)	
$R2 = R4 = 47k\Omega$ (nominal)	

## **Mechanical Data**

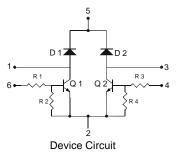
- Case: SOT-363
- Case Material: Molded Plastic. "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish Matte Tin annealed over Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.0062 grams (approximate)



Top View



Top View



### Ordering Information (Note 3)

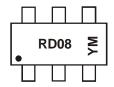
Device	Packaging	Shipping
DRDNB21D-7	SOT-363	3000/Tape & Reel

Notes:	1. No purposefully added lead.
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2. Diodes Inc.'s "Green" Policy can be found on our website at http://www.diodes.com

3. For packaging details, visit our website at http://www.diodes.com.

# Marking Information



RD08 = Product Type Marking Code YM = Date Code Marking Y = Year (e.g. T = 2006) M = Month (e.g. 1 = January)

Date Code	Key											
Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Code	S	Т	U	V	W	Х	Y	Z	А	В	С	D
		· - ·		· ·		· ·						_
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



# Maximum Ratings, Total Device $@T_A = 25^{\circ}C$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 4)	PD	200	mW
Thermal Resistance, Junction to Ambient Air (Note 4)	$R_{ ext{ heta}JA}$	625	°C/W
Operating and Storage Junction Temperature Range	TJ, T <sub>STG</sub>	-55 to +150	°C

### Maximum Ratings, Pre-Biased NPN Transistor @TA = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Collector-Emitter Voltage	Vcc	50	V
Base-Emitter Voltage	V <sub>in</sub>	-5 to +12	V
Output Current	Io	100	mA
Peak Collector Current	I <sub>CM</sub>	100	mA

# Maximum Ratings, Switching Diode @TA = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit
Non-Repetitive Peak Reverse Voltage	V <sub>RM</sub>	100	V
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	75	V
RMS Reverse Voltage	V <sub>R(RMS)</sub>	53	V
Forward Continuous Current (Note 4)	I <sub>FM</sub>	500	mA
Average Rectified Output Current (Note 4)	lo	250	mA
Non-Repetitive Peak Forward Surge Current @ t = 1.0μs @ t = 1.0s	I <sub>FSM</sub>	4.0 1.0	А

# Electrical Characteristics, Pre-Biased NPN Transistor @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Input Voltage	V <sub>I(off)</sub>	0.5	_		V	$V_{CC} = 5V, I_{O} = 100\mu A$
input voltage	V <sub>I(on)</sub>	_	—	1.1	V	$V_0 = 0.3V, I_0 = 5mA$
Output Voltage	V <sub>O(on)</sub>		_	0.3	V	$I_0/I_1 = 50 \text{mA}/0.25 \text{mA}$
Input Current	lı –		_	3.6	mA	$V_I = 5V$
Output Current	I <sub>O(off)</sub>	_	_	0.5	uA	$V_{CC} = 50V, V_{I} = 0V$
DC Current Gain	GI	80	_		_	$V_0 = 5V, I_0 = 10mA$
Input Resistor Tolerance	∆R1	-30		+30	%	-
Resistance Ratio Tolerance	∆R2/R1	-20	_	+20	%	-
Gain-Bandwidth Product*	fт	_	250		MHz	V <sub>CE</sub> = 10V, I <sub>E</sub> = 5mA, f = 100MHz

Transistor - For Reference Only

# **Electrical Characteristics, Switching Diode** @T<sub>A</sub> = 25°C unless otherwise specified

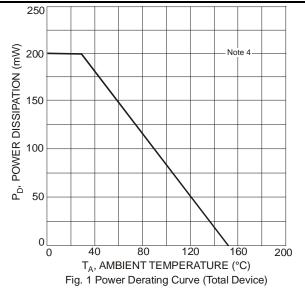
Characteristic	Symbol	Min	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 5)	V <sub>(BR)R</sub>	75	_	V	$I_R = 10 \mu A$
		0.62	0.72		I <sub>F</sub> = 5.0mA
Forward Voltage	VF	_	0.855	V	$I_F = 10 \text{mA}$
Torward Voltage	VF	_	1.0	-	$I_F = 100 \text{mA}$
		_	1.25		I <sub>F</sub> = 150mA
			2.5	μA	$V_R = 75V$
Reverse Current (Note 5)	I <sub>R</sub>		50	μA	V <sub>R</sub> = 75V, T <sub>J</sub> = 150°C
Reverse Current (Note 5)		IR	_	30	μA
			25	nA	$V_R = 20V$
Total Capacitance	CT		4.0	pF	$V_{R} = 0, f = 1.0MHz$
Reverse Recovery Time	t <sub>rr</sub>		4.0	ns	$I_F = I_R = 10 \text{mA}, \ I_{rr} = 0.1 \text{ x } I_R, R_L = 100 \Omega$

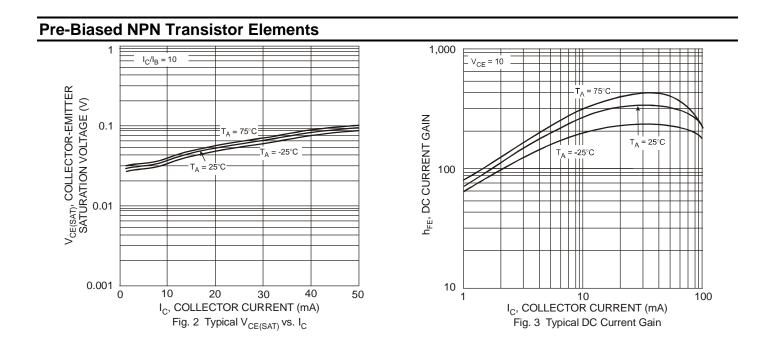
Notes: 4. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at http://www.diodes.com

5. Short duration pulse test used to minimize self-heating effect.



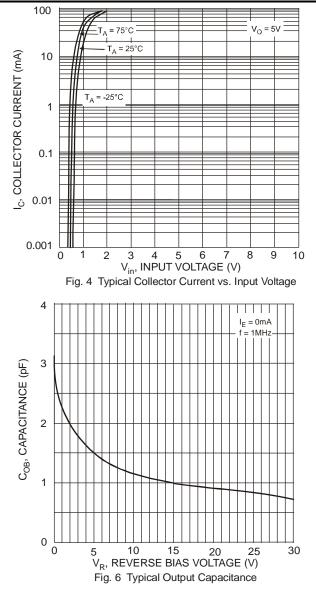
# **Device Characteristics**

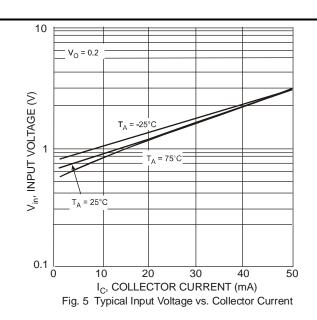






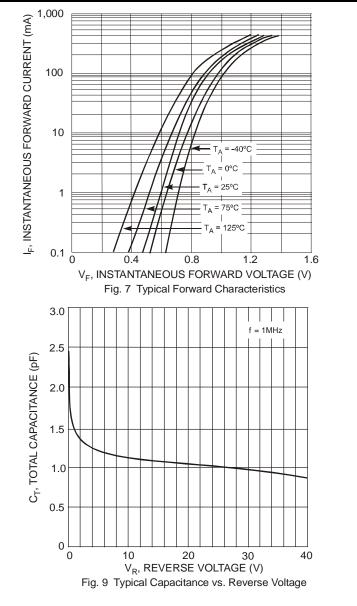
# **Pre-Biased NPN Transistor Elements - continued**

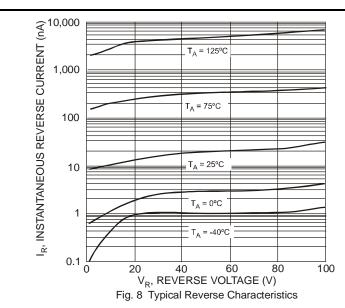




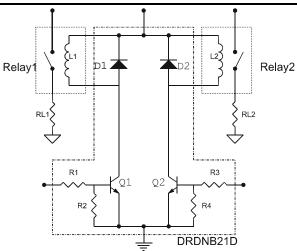


# **Switching Diode Elements**





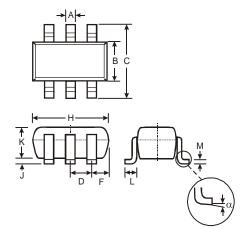
# **Typical Application Circuit**



Typical Application Circuit DRDNB21D with two independent relays.

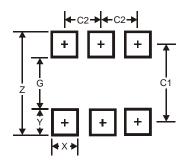


# Package Outline Dimensions



	SOT-363				
Dim	Min	Max			
Α	0.10	0.30			
в	1.15	1.35			
C	2.00	2.20			
D	0.65	Тур			
F	0.40	0.45			
Н	1.80	2.20			
<b>ر</b>	0 0.10				
κ	0.90 1.00				
L	0.25 0.40				
М	0.10	0.22			
α	0°	8°			
All Di	mensions	in mm			

# Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.5
G	1.3
Х	0.42
Y	0.6
C1	1.9
C2	0.65



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