

40CDQ & 60CDQ SERIES AND SD241

40 and 60 Amp Dual Schottky Center Tap Rectifiers

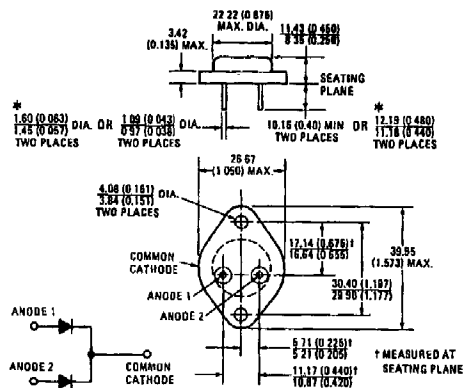
Major Ratings and Characteristics

Characteristics	40CDQ	SD241	60CDQ	Units
I_O Rectangular Waveform	40	60	60	A
Sinusoidal Waveform	36	54	54	
I_{FSM} @ 50 Hz	380		475	A
@ 60 Hz	400		500	
I_{2t} @ 50 Hz	730	1140		A^2s
@ 60 Hz	665	1040		
$I^2\sqrt{t}$	10,325	16,130		$A^2\sqrt{s}$
V_{RWM}	20 - 45	35	20 - 45	V
$C_t @ -5V$	1400			pF
T_J	-65 to 175			$^{\circ}C$

Description/Features

The 40CDQ and 60CDQ Dual Schottky Rectifier Series and SD241 employ the "830" process which results in a very low ratio of reverse leakage current to junction temperature. In addition to offering improvements in reliability and performance, they are rugged devices with a guaranteed repetitive peak reverse voltage capability, and excellent ability to withstand reverse energy transients. They can be used in both existing and new designs.

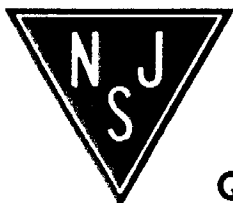
- 175 $^{\circ}C$ T_J operation
- 100% reverse energy tested (each junction)
- 400A and 500A surge, 60 Hz, one cycle (per junction)
- Extremely low reverse leakage: 10 mA @ 25 $^{\circ}C$
- No voltage derating of V_{RWM} over temperature range
- A guaranteed repetitive peak reverse voltage capability for short pulses which is 20% above V_{RWM}
- High power supply reliability
- Minimizes problem of thermal runaway
- TO-204AE (Modified TO-3) Case Style available (60CDQ series)
- Can be supplied to meet stringent military, aerospace and other high-reliability requirements.



Conforms to JEDEC Outline TO-204AA (TO-3)

*Conforms to JEDEC Outline TO-204AE (Modified TO-3)

All Dimensions in Millimeters and (Inches)



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

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VOLTAGE RATINGS PER JUNCTION

Part Numbers			V_{RWM} - Max. Working Peak Reverse Voltage (V) ①	V_{RRM} - Max. Repetitive Peak Reverse Voltage (V) ① ($t_p = 200$ ns Max.)	V_R - Max. Direct Reverse Voltage (V) ①
40CDQ020	-	60CDQ020	20	24	20
40CDQ030	-	60CDQ030	30	36	30
40CDQ035	SD241	60CDQ035	36 ①	42 ①	35
40CDQ040	-	60CDQ040	40	48	40
40CDQ045	-	60CDQ045	45	54	45

ELECTRICAL SPECIFICATIONS

	40CDQ	SD241	60CDQ	Units	Conditions
I_O Max. average output current from center tap circuit	40	60	60	A	180° conduction, rectangular waveform, $T_C = -40$ to 143°C for 40CDQ, $T_C = -40$ to 120°C for 60CDQ.
	36	54	54	A	180° conduction, sinusoidal waveform, $T_C = -40$ to 141°C for 40CDQ, $T_C = -40$ to 118°C for 60CDQ.
I_{FSM} Max. peak one cycle, non-repetitive surge current, per junction	380	475	475	A	50 Hz half cycle sine wave or 8 ms rectangular pulse, Following any rated load condition and with rated V_{RWM} applied.
	400	500	500	A	60 Hz half cycle sine wave or 8 ms rectangular pulse,
	455	570	570	A	50 Hz With $V_{RWM} = 0$ following surge, initial $T_J = 175^\circ\text{C}$.
	475	595	595	A	60 Hz
I_{2t} Max. I^2t for fusing, per junction	730	1140	1140	A^2s	$t = 10$ ms. Rated V_{RWM} following surge, initial $T_J = 175^\circ\text{C}$.
	665	1040	1040	A^2s	$t = 8.3$ ms.
I_{2t} Max. I^2t for individual junction fusing, per junction	1030	1610	1610	A^2s	$t = 10$ ms. V_{RWM} following surge = 0, initial $T_J = 175^\circ\text{C}$.
	940	1470	1470	A^2s	$t = 8.3$ ms.
$I^2\sqrt{t}$ Max. $I^2\sqrt{t}$ for individual junction fusing, per junction ①	10,325	16,130	16,130	$A^2\sqrt{s}$	$t = 0.1$ to 10 ms, $T_J = 175^\circ\text{C}$, $V_{RWM} = 0$ following surge.
V_{FM} Max. peak forward voltage per junction	0.70	0.82	0.82	V	$T_J = 25^\circ\text{C}$ $I_{FM} = 20\text{A}$ peak for 40CDQ, $I_{FM} = 30\text{A}$ peak for 60CDQ and SD241 180° rectangular wave.
	0.91	1.09	1.09	V	Rated $I_F(AV)$ (40A peak for 40CDQ, 60A peak for 60CDQ and SD241) 180° rectangular wave.
	0.74	0.92	0.92	V	$T_J = 175^\circ\text{C}$
I_{RM} Max. peak reverse current, per junction	10	20	20	mA	$T_J = 25^\circ\text{C}$ $V_{RM} = \text{rated } V_{RWM}$
	20	20	20	mA	$T_J = 125^\circ\text{C}$
I_{RRM} Max. repetitive peak reverse current	2.0	2.0	2.0	A	$T_C = 25^\circ\text{C}$, $t_p = 2 \mu\text{s}$ rectangular pulse, $f = 1$ kHz. ① see fig. 11 for test circuit.
C_t Max. capacitance, per junction	1400	1400	1400	pF	$T_C = 25^\circ\text{C}$, $V_R = 5$ Vdc (Test signal in the range of 100 kHz to 1 MHz)
dv/dt Max. rate of application of reverse voltage, per junction	1000	1000	1000	V/ μs	$T_C = 25^\circ\text{C}$, $V_{RM} = \text{rated } V_{RWM}$

THERMAL-MECHANICAL SPECIFICATIONS

T_J Max. operating junction temperature range	-55 to 175	°C	
T_{stg} Max. storage temperature range	-55 to 175	°C	
R_{thJC} Max. thermal resistance, junction-to-case, DC operation	1.4	deg. C/W	Based on power dissipated in one junction, both junctions operating.
Max. composite thermal resistance, junction-to-case, DC operation	0.7	deg. C/W	Based on power dissipated in both junctions.
R_{thCS} Thermal resistance, case-to-sink	0.2	deg. C/W	Mounting surface flat, smooth and grafted.
wt Approximate weight	12.8 (0.45)	g (oz.)	
Case Style	TO-204AA (TO-3)	TO-204AE (Modified TO-3)	Terminals 1 and 2: Anodes 1 and 2 Case: Common Cathodes

① $T_C = -55$ to 172°C , 180° conduction

② $T_C = 0$ to 172°C , 180° conduction

③ $T_C = -55$ to 162°C .

④ For SD241 rated V_{RWM} and $V_{RRM} = 45\text{V}$ @ $T_J = 25^\circ\text{C}$, $= 35\text{V}$ @ $T_J = 150^\circ\text{C}$

⑤ I^2t for time $t_x = I^2\sqrt{t} \cdot \sqrt{t_x}$.

⑥ For test circuit refer to Fig. 11.