

NCV8402D, NCV8402AD

MAXIMUM RATINGS ($T_J = 25\text{ C}$ unless otherwise noted)

| Rating | Symbol | Value | Unit |
|--|------------------------------------|--|------|
| Drain-to-Source Voltage Internally Clamped | V_{DSS} | 42 | V |
| Drain-to-Gate Voltage Internally Clamped ($R_G = 1.0\text{ M}\Omega$) | V_{DGR} | 42 | V |
| Gate-to-Source Voltage | V_{GS} | ± 14 | V |
| Continuous Drain Current | I_D | Internally Limited | |
| Total Power Dissipation | P_D | 0.8 1.62 | W |
| | | @ $T_A = 25\text{ C}$ (Note 1) @ $T_A = 25\text{ C}$ (Note 2) | |
| Maximum Continuous Drain, both channels on | I_D | 1.87 2.65 | A |
| | | @ $T_A = 25\text{ C}$ (Note 1) @ $T_A = 25\text{ C}$ (Note 2) | |
| Thermal Resistance | $R_{\theta JA}$ $R_{\theta JA}$ | 157 77 | C/W |
| | | Junction-to-Ambient Steady State (Note 1) Junction-to-Ambient Steady State (Note 2) | |
| Single Pulse Drain-to-Source Avalanche Energy ($V_{DD} = 32\text{ V}$, $V_G = 5.0\text{ V}$, $I_{PK} = 1.0\text{ A}$, $L = 300\text{ mH}$, $R_{G(ext)} = 25\ \Omega$) | E_{AS} | 150 | mJ |
| Load Dump Voltage ($V_{GS} = 0$ and 10 V , $R_I = 2.0\ \Omega$, $R_L = 9.0\ \Omega$, $t_d = 400\text{ ms}$) | V_{LD} | 55 | V |
| Operating Junction and Storage Temperature | T_J , T_{stg} | -55 to 150 | C |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Surface-mounted onto min pad FR4 PCB, (Cu area = 40 sq. mm, 1 oz.).
2. Surface-mounted onto 1 sq. FR4 board (Cu area = 625 sq. mm, 2 oz.).

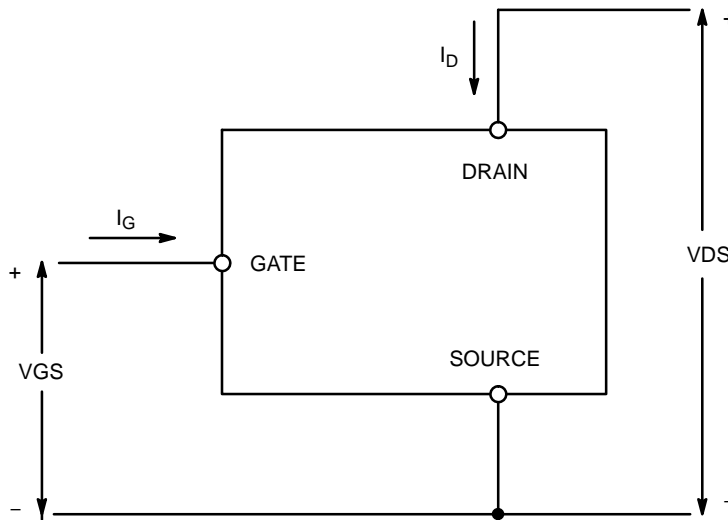


Figure 1. Voltage and Current Convention

| Max | Unit |
|-----|------|
|-----|------|

| | |
|-----|---------------|
| 55 | V |
| 55 | |
| 4.0 | μA |
| 20 | |
| 100 | μA |

| | |
|-----|------------------|
| 2.2 | V |
| 6.0 | -mV/ C |
| 200 | $\text{m}\Omega$ |
| 400 | |
| 230 | |
| 460 | |

| | |
|-----|---|
| 230 | |
| 460 | |
| | V |

| | |
|-----|------------------------|
| 30 | μs |
| 200 | μs |
| 25 | μs |
| 70 | μs |
| 1.2 | $\text{V}/\mu\text{s}$ |
| 0.5 | |

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ELECTRICAL CHARACTERISTICS ($T_J = 25\text{ C}$ unless otherwise noted)

| Parameter | Test Condition | Symbol | Min | Typ | Max | Unit |
|--|--|-----------|-----|------|-----|------|
| GATE INPUT CHARACTERISTICS (Note 5) | | | | | | |
| Current Limit Gate Input Current | $V_{GS} = 5\text{ V}, V_{DS} = 10\text{ V}$ | I_{GCL} | | 0.05 | | mA |
| | $V_{GS} = 10\text{ V}, V_{DS} = 10\text{ V}$ | | | 0.4 | | |
| Thermal Limit Fault Gate Input Current | $V_{GS} = 5\text{ V}, V_{DS} = 10\text{ V}$ | I_{GTL} | | 0.15 | | mA |
| | $V_{GS} = 10\text{ V}, V_{DS} = 10\text{ V}$ | | | 0.7 | | |

TYPICAL PERFORMANCE CURVES

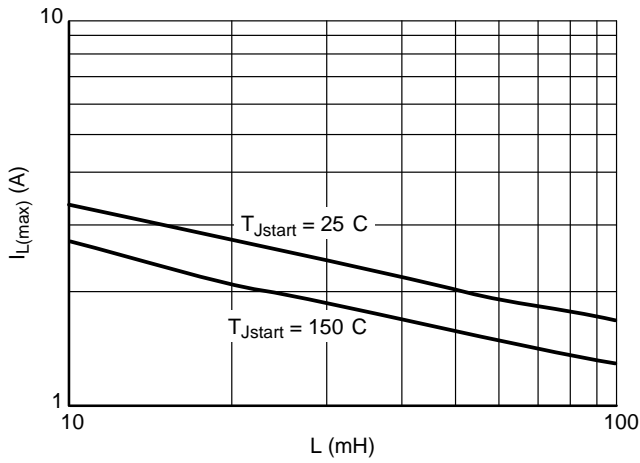
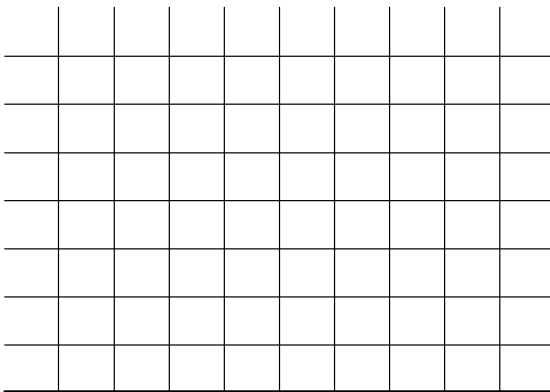
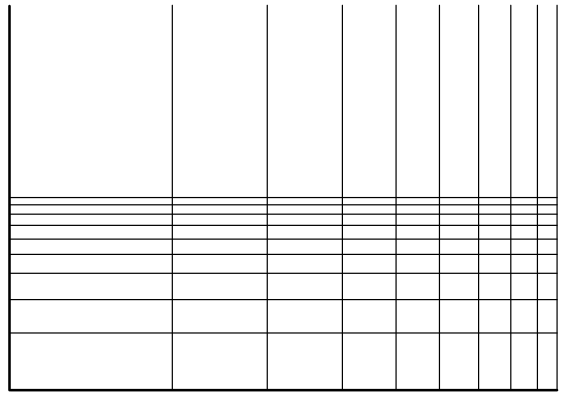
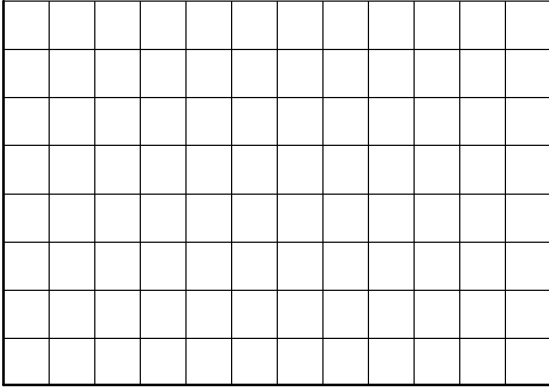


Figure 2. Single Pulse Maximum Switch-off Current vs. Load Inductance



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TYPICAL PERFORMANCE CURVES



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TYPICAL PERFORMANCE CURVES



Figure 20. Transient Thermal Resistance

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TEST CIRCUITS AND WAVEFORMS

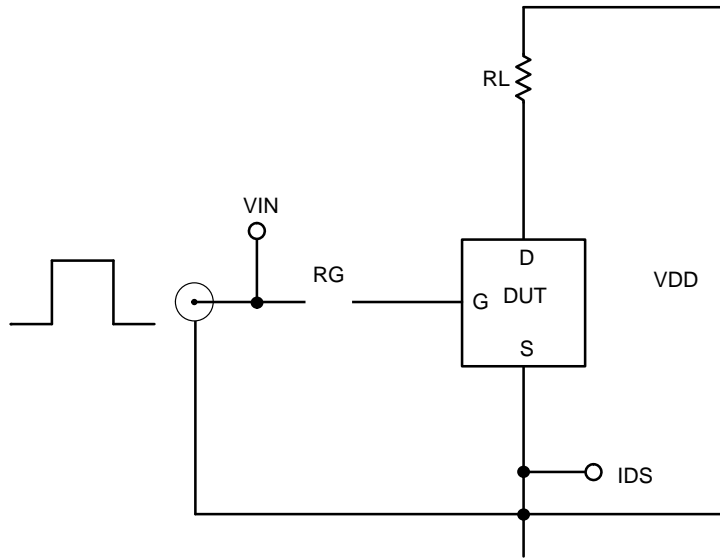


Figure 21. Resistive Load Switching Test Circuit

-X-

- - - -

⊕ 0. (0.010) ○ ○

-Y-

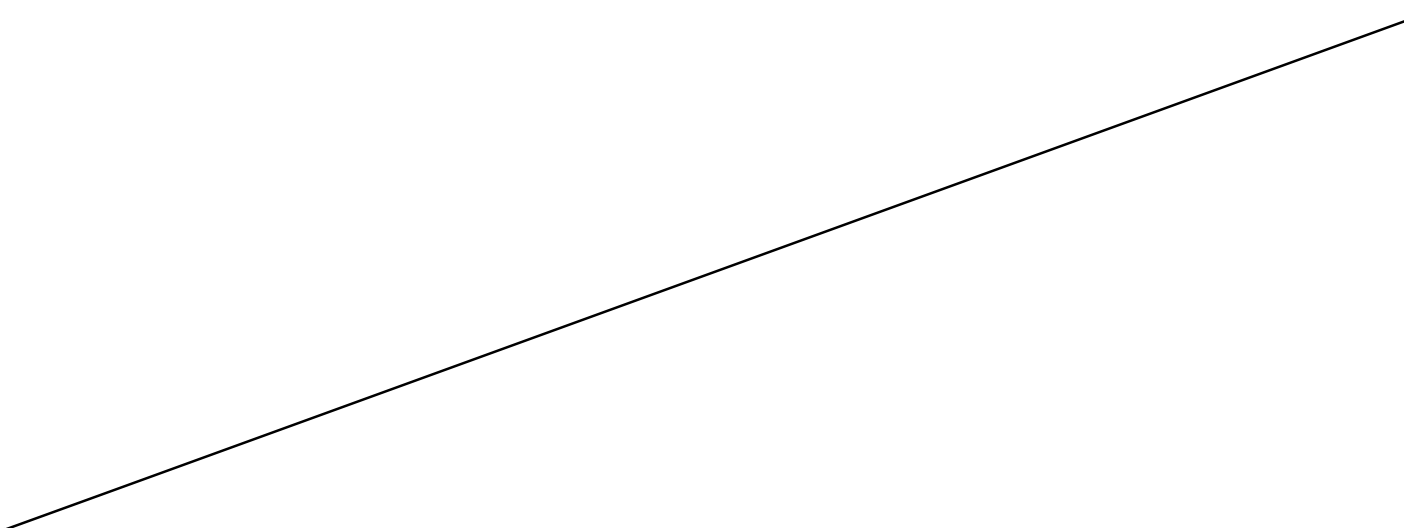
- - - -

G

-Z-

| | | | | |
|---|----------|------|-----------|-------|
| C | 1.35 | 1.75 | 0.053 | 0.069 |
| D | 0.33 | 0.51 | 0.013 | 0.020 |
| G | 1.27 BSC | | 0.050 BSC | |
| H | 0.10 | 0.25 | 0.004 | 0.010 |
| J | 0.19 | 0.25 | 0.007 | 0.010 |
| K | 0.40 | 1.27 | 0.016 | 0.050 |
| M | 0 | 8 | 0 | 8 |
| N | 0.25 | 0.50 | 0.010 | 0.020 |
| S | 5.80 | 6.20 | 0.228 | 0.244 |

0. (0.010) ○ 101100 1.000 0.1 1011. 100 0001.1 1001 1 0()01.1 100111.1 10000 5.80 6.20 0.228 0.244 1.0 0 1000 0.)



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