# ASDM80R055NP

80V N-Channel MOSFET

## General Features

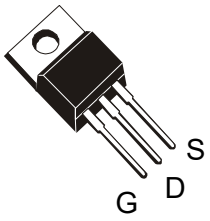
- 100% EAS Guaranteed
- Green Device Available
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Advanced high cell density Trench technology

## Product Summary

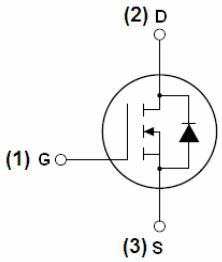
| | | |
|---|---|---|
| $V_{DS}$ | 80 | V |
| $R_{DS(on),Typ}$@ $V_{GS}$=10 V | 5.4 | mΩ |
| $I_D$ | 110 | A |

## Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply




TO-220 top view




## Absolute Maximum Ratings at T =25℃ (unless otherwise specified)

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | 80 | V |
| $V_{GS}$ | Gate-Source Voltage | ±20 | V |
| $I_D$@$T_C$=25℃ | Continuous Drain Current, $V_{GS}$ @ 10V[1,6] | 110 | A |
| $I_D$@$T_C$=100℃ | Continuous Drain Current, $V_{GS}$ @ 10V[1,6] | 105 | A |
| $I_{DM}$ | Pulsed Drain Current[2] | 270 | A |
| EAS | Single Pulse Avalanche Energy[3] | 300 | mJ |
| $I_{AS}$ | Avalanche Current | 34 | A |
| $P_D$@$T_C$=25℃ | Total Power Dissipation[4] | 56 | W |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | ℃ |
| $T_J$ | Operating Junction Temperature Range | -55 to 150 | ℃ |

## Thermal Data

| Symbol | Parameter | Typ. | Max. | Unit |
|---|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance Junction-Ambient [1] | --- | 55 | ℃/W |
| $R_{\theta JC}$ | Thermal Resistance Junction-Case[1] | --- | 0.84 | ℃/W |

## Electrical Characteristics ($T_J$=25 ℃, unless otherwise noted)

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V , $I_D$=250uA | 80 | --- | --- | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance[2] | $V_{GS}$=10V , $I_D$=20A | --- | 5.4 | 6 | mΩ |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance[2] | $V_{GS}$=4.5V , $I_D$=20A | --- | --- | 8.5 | mΩ |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{GS}$=$V_{DS}$ , $I_D$ =250uA | 2.5 | --- | 3.4 | V |
| $I_{DSS}$ | Drain-Source Leakage Current | $V_{DS}$=64V , $V_{GS}$=0V , $T_J$=25℃ | --- | --- | -1 | uA |
| | | $V_{DS}$=64V , $V_{GS}$=0V , $T_J$=55℃ | --- | --- | 1 | |
| $I_{GSS}$ | Gate-Source Leakage Current | $V_{GS}$=±20V , $V_{DS}$=0V | --- | --- | ±100 | nA |
| gfs | Forward Transconductance | $V_{DS}$=5V , $I_D$=20A | --- | 75 | --- | S |
| $R_g$ | Gate Resistance | $V_{DS}$=0V , $V_{GS}$=0V , f=1MHz | --- | 1.2 | --- | Ω |
| Qg | Total Gate Charge (10V) | $V_{DS}$=40V , $V_{GS}$=10V , $I_D$=20A | --- | 40 | --- | nC |
| Qgs | Gate-Source Charge | | --- | 7.2 | --- | |
| Qgd | Gate-Drain Charge | | --- | 6.5 | --- | |
| Td(on) | Turn-On Delay Time | $V_{DD}$=40V , $V_{GS}$=10V , $R_G$=3Ω, $I_D$=20A | --- | 8.3 | --- | ns |
| Tr | Rise Time | | --- | 4.2 | --- | |
| Td(off) | Turn-Off Delay Time | | --- | 36 | --- | |
| Tf | Fall Time | | --- | 6.9 | --- | |
| Ciss | Input Capacitance | $V_{DS}$=40V , $V_{GS}$=0V , f=1MHz | --- | 3730 | --- | pF |
| Coss | Output Capacitance | | --- | 674 | --- | |
| Crss | Reverse Transfer Capacitance | | --- | 24.24 | --- | |

## Diode Characteristics

| Symbol | Parameter | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| $I_S$ | Continuous Source Current[1,5] | $V_G$=$V_D$=0V , Force Current | --- | --- | 48 | A |
| $V_{SD}$ | Diode Forward Voltage[2] | $V_{GS}$=0V , $I_S$=A , $T_J$=25℃ | --- | 0.7 | --- | V |
| $t_{rr}$ | Reverse Recovery Time | $I_F$=20A , dI/dt=100A/μs , $T_J$=25℃ | --- | 27 | --- | nS |
| $Q_{rr}$ | Reverse Recovery Charge | | --- | 89 | --- | nC |

Note :
1.The data tested by surface mounted on a 1 inch$^2$ FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is $V_{DD}$=25V,$V_{GS}$=10V,L=0.1mH,$I_{AS}$=34A
4.The power dissipation is limited by 150℃ junction temperature
5.The data is theoretically the same as $I_D$ and $I_{DM}$ , in real applications , should be limited by total power dissipation.
6.The maximum current rating is package limited.

## Test Circuit

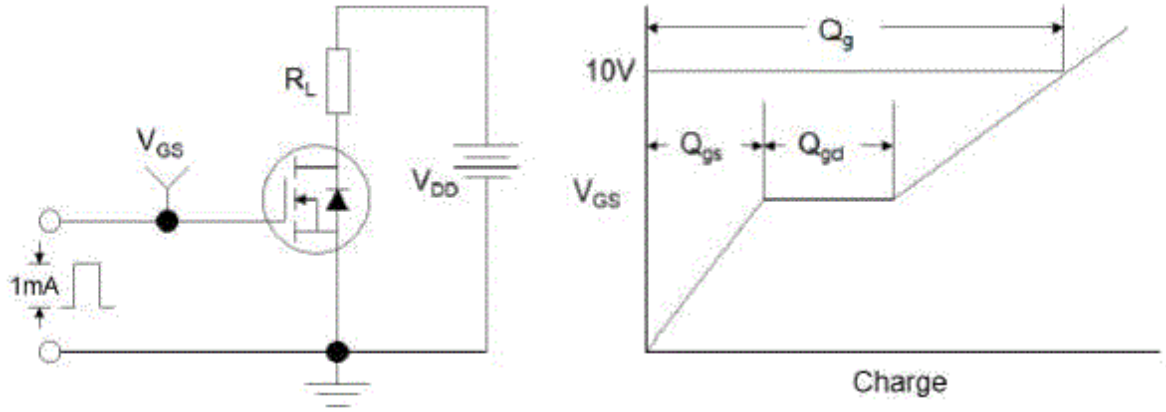



**Figure1:Gate Charge Test Circuit & Waveform**

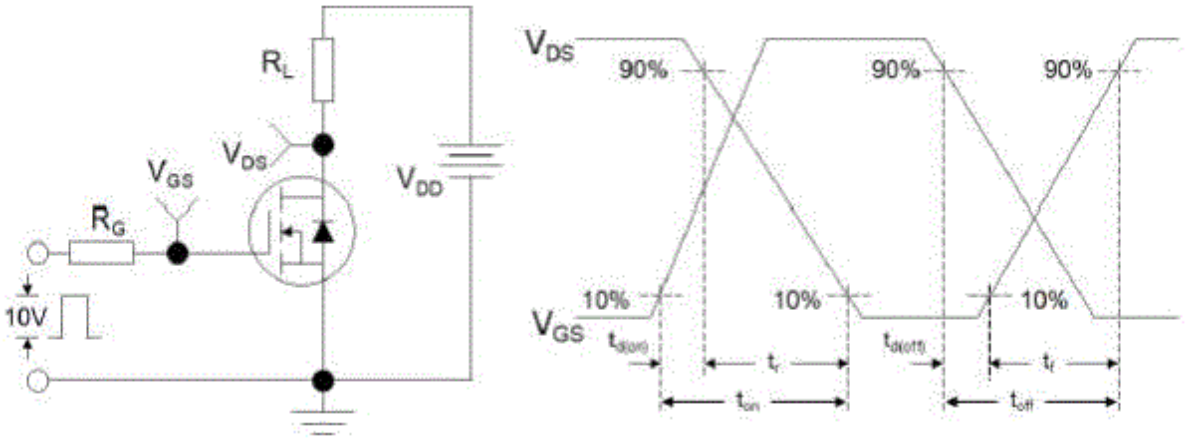



**Figure 2: Resistive Switching Test Circuit & Waveforms**

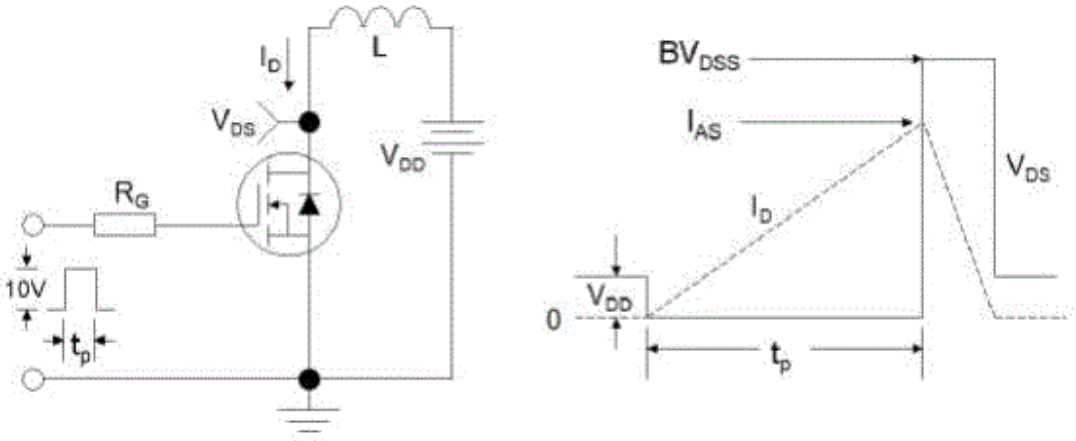



**Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms**

## Typical Characteristics

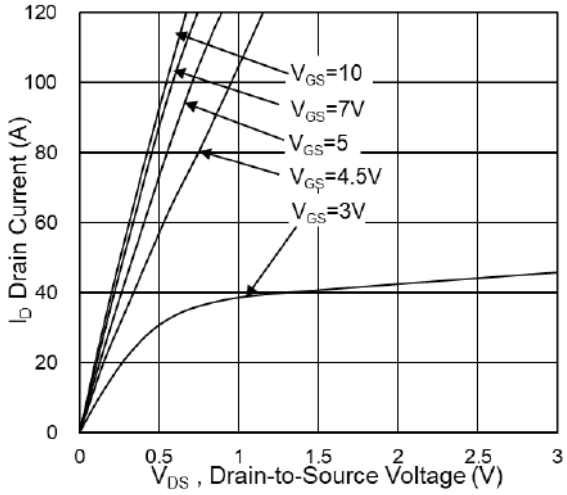



**Fig.1 Typical Output Characteristics**

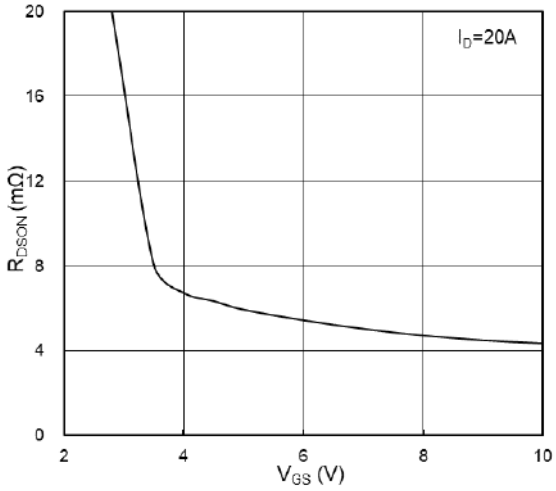



**Fig.2 On-Resistance vs G-S Voltage**

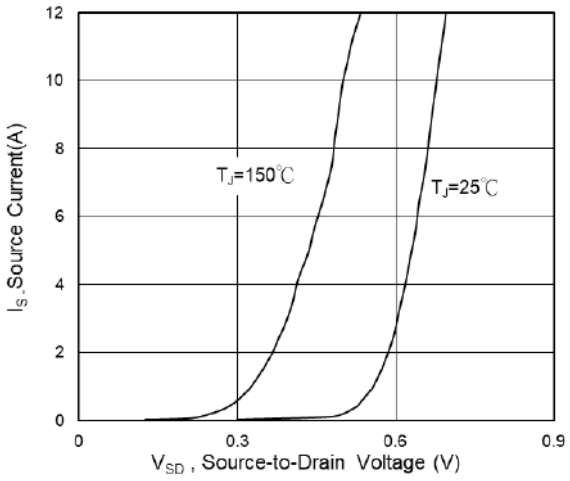



**Fig.3 Source Drain Forward Characteristics**

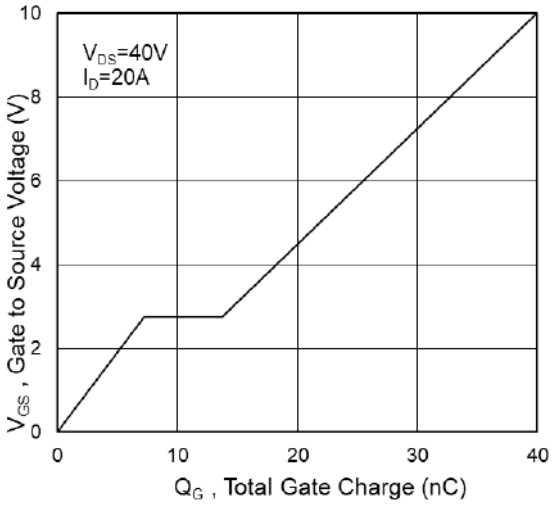



**Fig.4 Gate-Charge Characteristics**

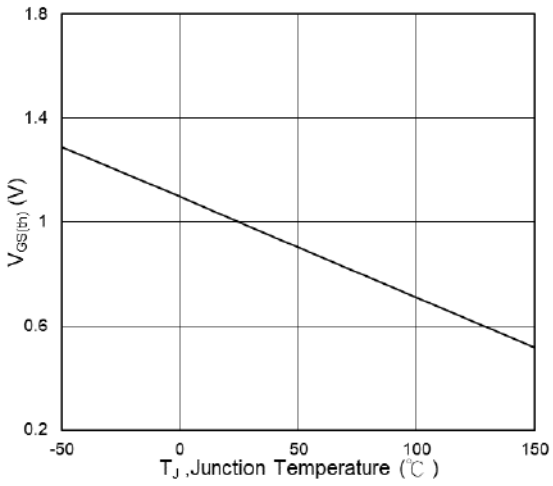



**Fig.5 Normalized $V_{GS(th)}$ vs $T_J$**

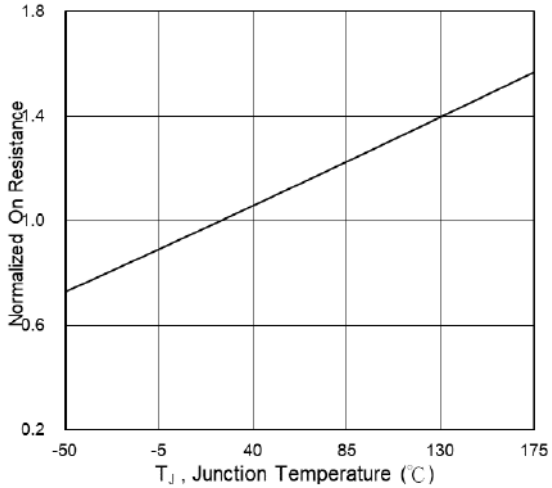



**Fig.6 Normalized $R_{DSON}$ vs $T_J$**

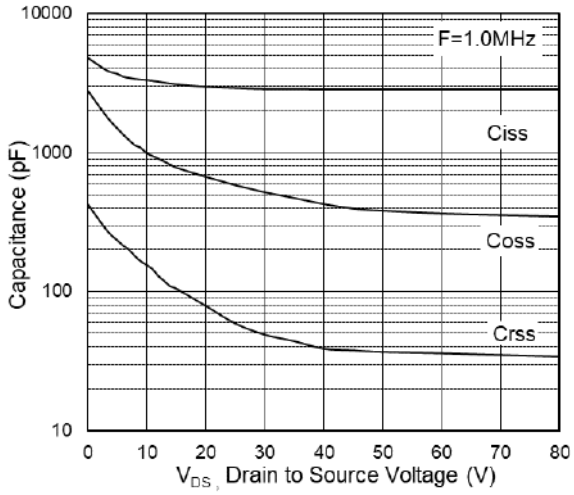



Fig.7 Capacitance

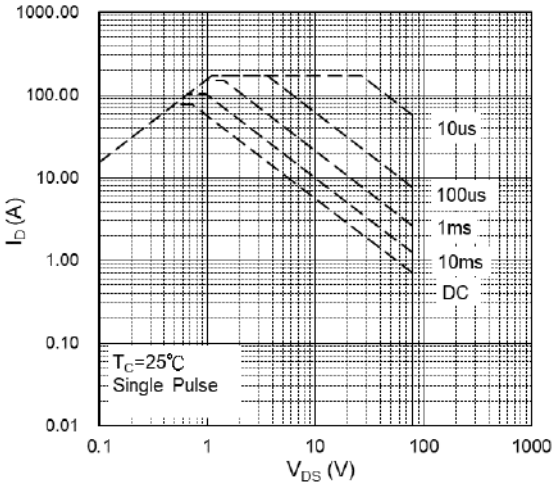



Fig.8 Safe Operating Area

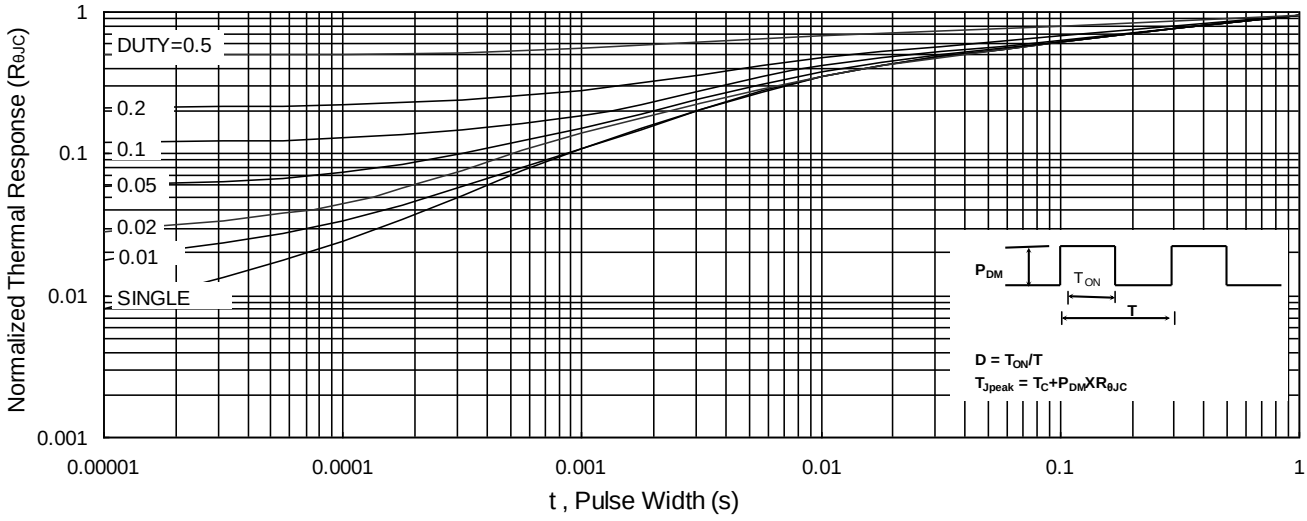



Fig.9 Normalized Maximum Transient Thermal Impedance

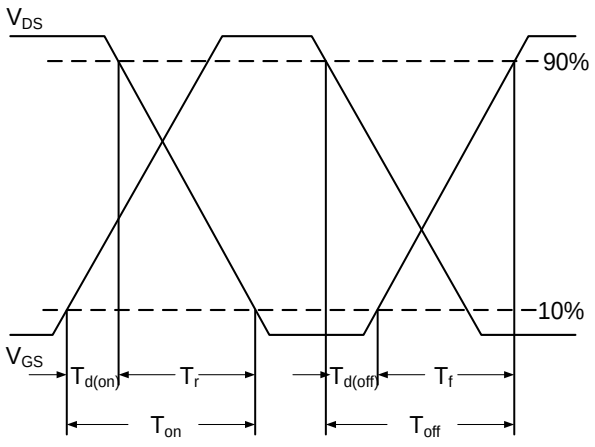



Fig.10 Switching Time Waveform

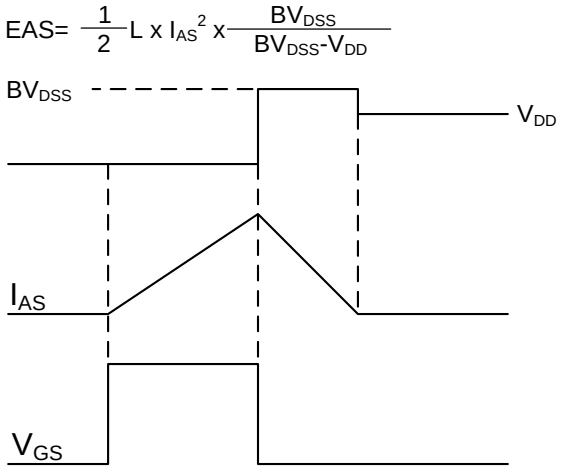
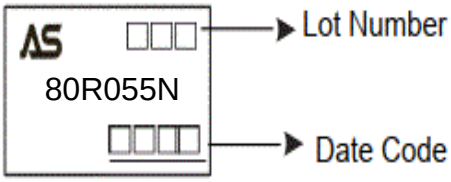


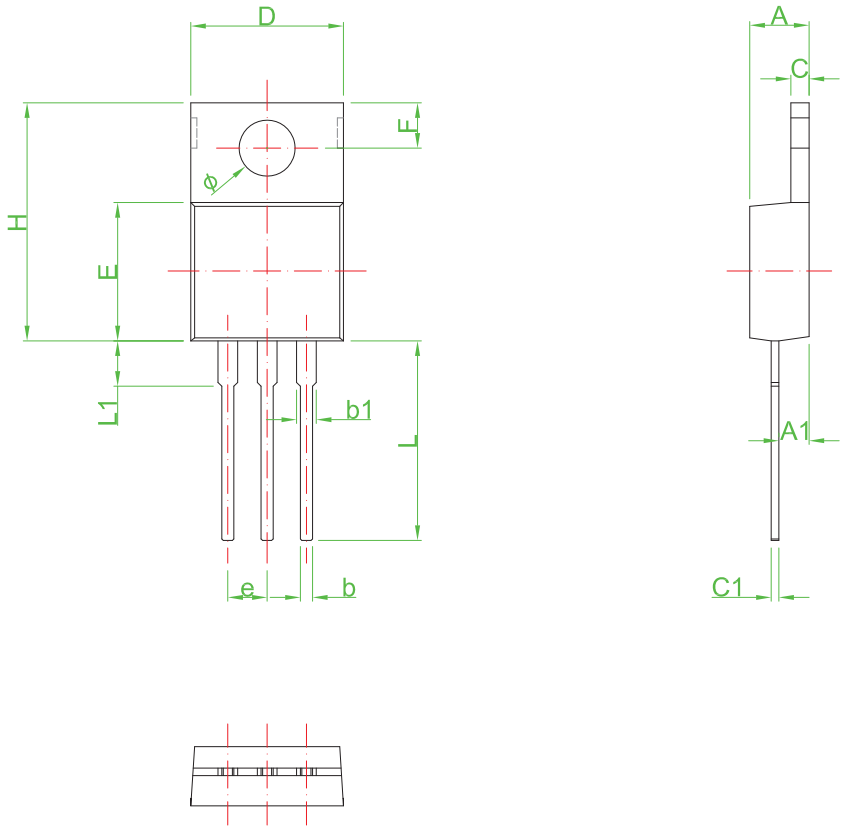

Fig.11 Unclamped Inductive Switching Waveform

## Ordering and Marking Information

| Ordering Device No | Marking | Package | Packing | Quantity |
|---|---|---|---|---|
| ASDM80R055NP-T | 80R055N | TO-220 | Tube | 50/Tube |

| PACKAGE | MARKING |
|---|---|
| TO-220 |  |

## TO-220 Package Information




| Symbol | Dimensions In Millmeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 4.00 | 4.80 | 0.157 | 0.189 |
| A1 | 1.80 | 2.80 | 0.071 | 0.110 |
| b | 0.60 | 1.00 | 0.024 | 0.039 |
| b1 | 1.14 | 1.78 | 0.045 | 0.070 |
| C | 1.00 | 1.40 | 0.039 | 0.055 |
| C1 | 0.36 | 0.61 | 0.014 | 0.024 |
| D | 9.90 | 10.50 | 0.390 | 0.413 |
| E | 8.38 | 9.20 | 0.330 | 0.362 |
| e | 2.54 TYP | | 0.100 TYP | |
| F | 2.54 | 3.20 | 0.100 | 0.126 |
| ø | 3.50 | 3.90 | 0.138 | 0.154 |
| H | 14.48 | 15.87 | 0.570 | 0.625 |
| L | 13.00 | 13.80 | 0.512 | 0.543 |
| L1 | --- | 4.10 | --- | 0.161 |

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