



# SPN3055 N-Channel Enhancement Mode MOSFET

## DESCRIPTION

The SPN3055 is the N-Channel logic enhancement mode power field effect transistors are produced using high cell density , DMOS trench technology.

This high density process is especially tailored to minimize on-state resistance. These devices are particularly suited for low voltage application, such as DC/DC converter and Desktop computer power management.

The package is universally preferred for commercial industrial surface mount applications

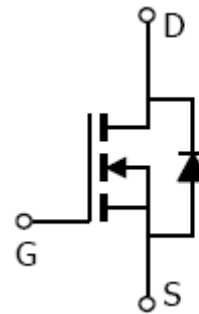
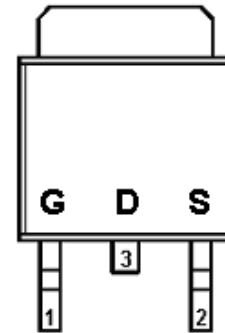
## FEATURES

- ◆ 30V/12A,  $R_{DS(ON)}=60m\Omega@V_{GS}=10V$
- ◆ 30V/6A,  $R_{DS(ON)}=80m\Omega@V_{GS}=4.5V$
- ◆ Super high density cell design for extremely low  $R_{DS(ON)}$
- ◆ Exceptional on-resistance and maximum DC current capability
- ◆ TO-252-2L package design

## APPLICATIONS

- Power Management in Desktop Computer
- DC/DC Converter
- LCD Display inverter

## PIN CONFIGURATION ( TO-252-2L )



## PART MARKING





# SPN3055

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### PIN DESCRIPTION

| Pin | Symbol | Description |
|-----|--------|-------------|
| 1   | G      | Gate        |
| 2   | S      | Source      |
| 3   | D      | Drain       |

### ORDERING INFORMATION

| Part Number    | Package   | Part Marking |
|----------------|-----------|--------------|
| SPN3055T252RG  | TO-252-2L | SPN3055      |
| SPN3055T252RGB | TO-252-2L | SPN3055      |

※ SPN3055T252RG : Tape Reel ; Pb – Free

※ SPN3055T252RGB : Tape Reel ; Pb – Free ; Halogen - Free

### ABSOLUTE MAXIMUM RATINGS

(TA=25°C Unless otherwise noted)

| Parameter                                       | Symbol           | Typical | Unit |   |
|---|------------------|---------|------|---|
| Drain-Source Voltage                            | V <sub>DSS</sub> | 30      | V    |   |
| Gate –Source Voltage                            | V <sub>GSS</sub> | ±20     | V    |   |
| Continuous Drain Current(T <sub>J</sub> =150°C) | I <sub>D</sub>   | TA=25°C | 12   | A |
|   |                  | TA=70°C | 8    |   |
| Pulsed Drain Current                            | I <sub>DM</sub>  | 20      | A    |   |
| Continuous Source Current(Diode Conduction)     | I <sub>S</sub>   | 12      | A    |   |
| Power Dissipation                               | P <sub>D</sub>   | TA=25°C | 40   | W |
|   |                  | TA=70°C | 20   |   |
| Operating Junction Temperature                  | T <sub>J</sub>   | -55/150 | °C   |   |
| Storage Temperature Range                       | T <sub>STG</sub> | -55/150 | °C   |   |
| Thermal Resistance-Junction to Ambient          | R <sub>θJA</sub> | 100     | °C/W |   |



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### ELECTRICAL CHARACTERISTICS

(TA=25°C Unless otherwise noted)

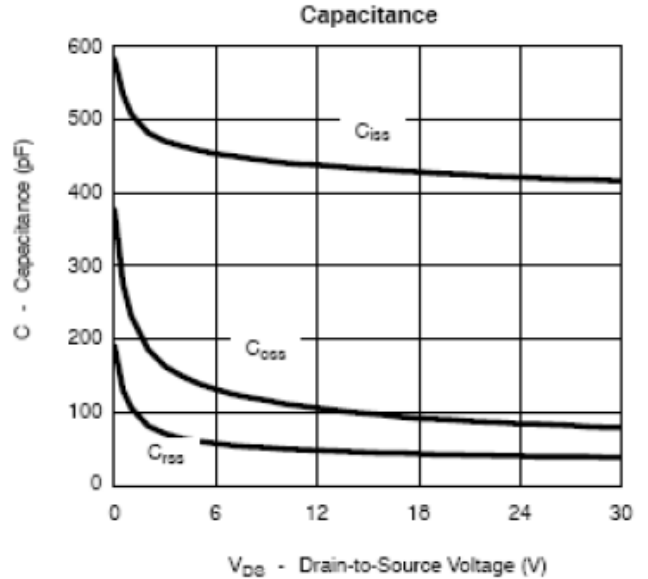
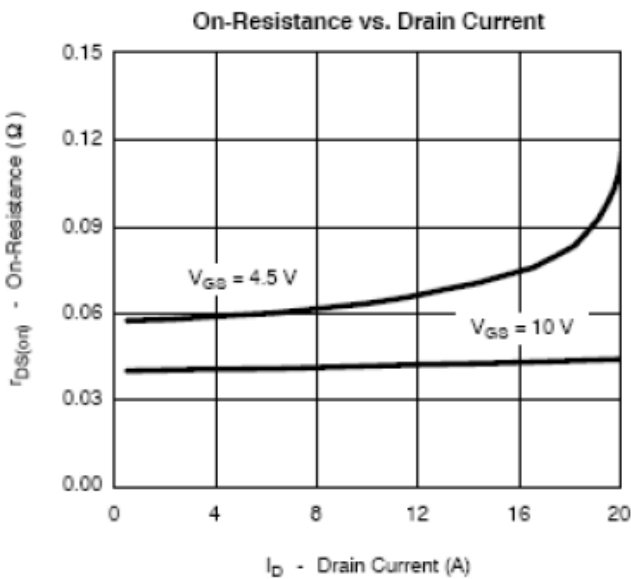
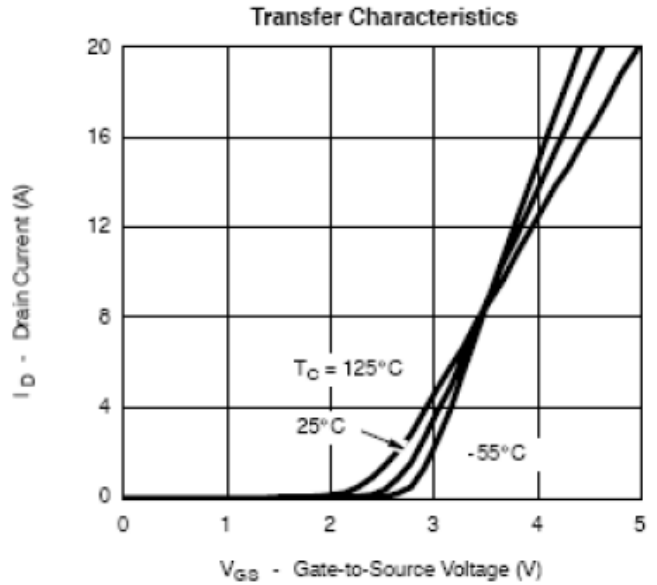
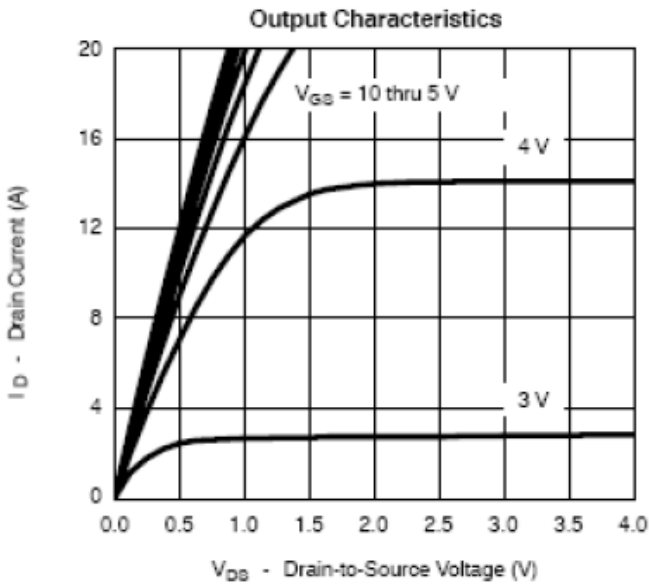
| Parameter                       | Symbol        | Conditions   | Min. | Typ   | Max.      | Unit     |
|---------------------------------|---------------|--|------|-------|-----------|----------|
| <b>Static</b>                   |               |  |      |       |           |          |
| Drain-Source Breakdown Voltage  | $V_{(BR)DSS}$ | $V_{GS}=0V, I_D=-250\mu A$   | 30   |       |           | V        |
| Gate Threshold Voltage          | $V_{GS(th)}$  | $V_{DS}=V_{GS}, I_D=-250\mu A$   | 1.0  |       | 3.0       |          |
| Gate Leakage Current            | $I_{GSS}$     | $V_{DS}=0V, V_{GS}=\pm 20V$  |      |       | $\pm 100$ | nA       |
| Zero Gate Voltage Drain Current | $I_{DSS}$     | $V_{DS}=24V, V_{GS}=0V$  |      |       | 1         | uA       |
|                                 |               | $V_{DS}=24V, V_{GS}=0V$<br>$T_J=85^\circ C$                            |      |       | 10        |          |
| Drain-Source On-Resistance      | $R_{DS(on)}$  | $V_{GS}=10V, I_D=12A$  |      | 0.050 | 0.06      | $\Omega$ |
|                                 |               | $V_{GS}=4.5V, I_D=6A$  |      | 0.067 | 0.080     |          |
| Forward Transconductance        | $g_{fs}$      | $V_{DS}=10V, I_D=12A$  |      | 20    |           | S        |
| Diode Forward Voltage           | $V_{SD}$      | $I_S=6A, V_{GS}=0V$  |      | 1.0   | 1.2       | V        |
| <b>Dynamic</b>                  |               |  |      |       |           |          |
| Total Gate Charge               | $Q_g$         | $V_{DS}=15V, V_{GS}=10V$<br>$I_D=12A$                                  |      | 4.5   | 10        | nC       |
| Gate-Source Charge              | $Q_{gs}$      |  |      | 0.8   |           |          |
| Gate-Drain Charge               | $Q_{gd}$      |  |      | 1.0   |           |          |
| Input Capacitance               | $C_{iss}$     | $V_{DS}=15V, V_{GS}=0V$<br>$f=1MHz$                                    |      | 240   |           | pF       |
| Output Capacitance              | $C_{oss}$     |  |      | 110   |           |          |
| Reverse Transfer Capacitance    | $C_{rss}$     |  |      | 17    |           |          |
| Turn-On Time                    | $t_{d(on)}$   | $V_{DD}=15V, R_L=15\Omega$<br>$I_D=1.0A, V_{GEN}=10V$<br>$R_G=6\Omega$ |      | 8     | 20        | ns       |
|                                 | $t_r$         |  |      | 12    | 30        |          |
| Turn-Off Time                   | $t_{d(off)}$  |  |      | 17    | 35        |          |
|                                 | $t_f$         |  |      | 8     | 20        |          |



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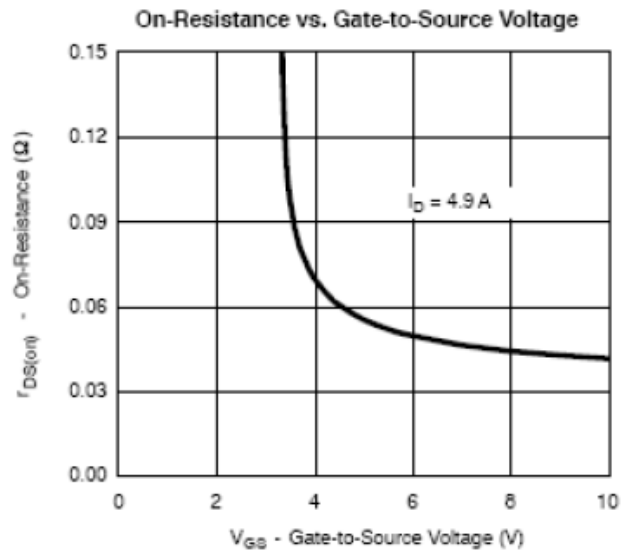
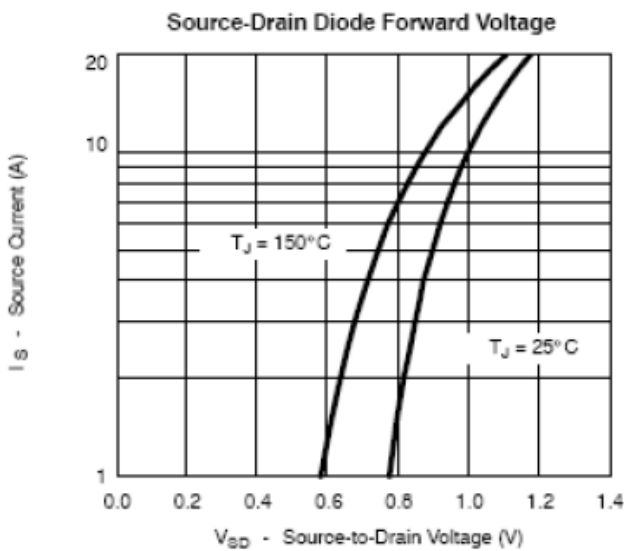
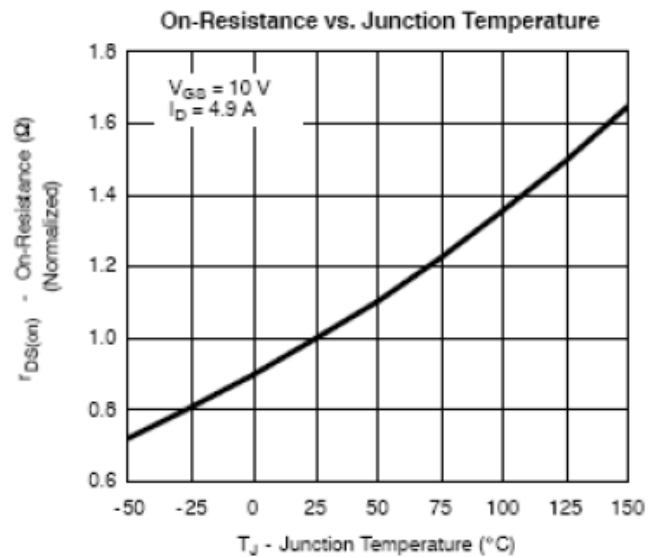
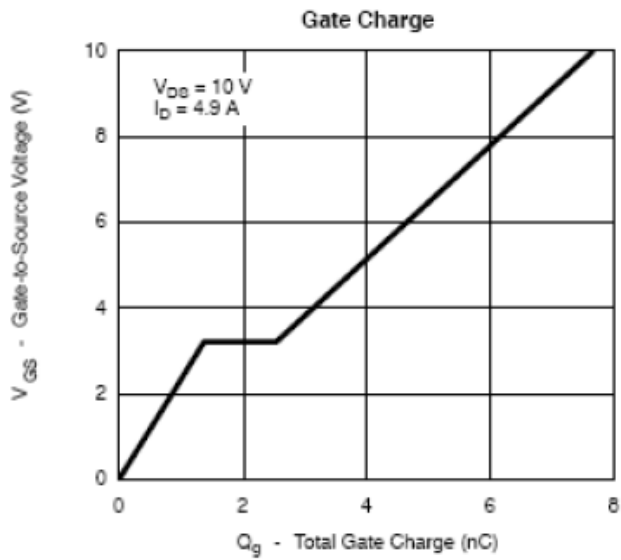
### TYPICAL CHARACTERISTICS





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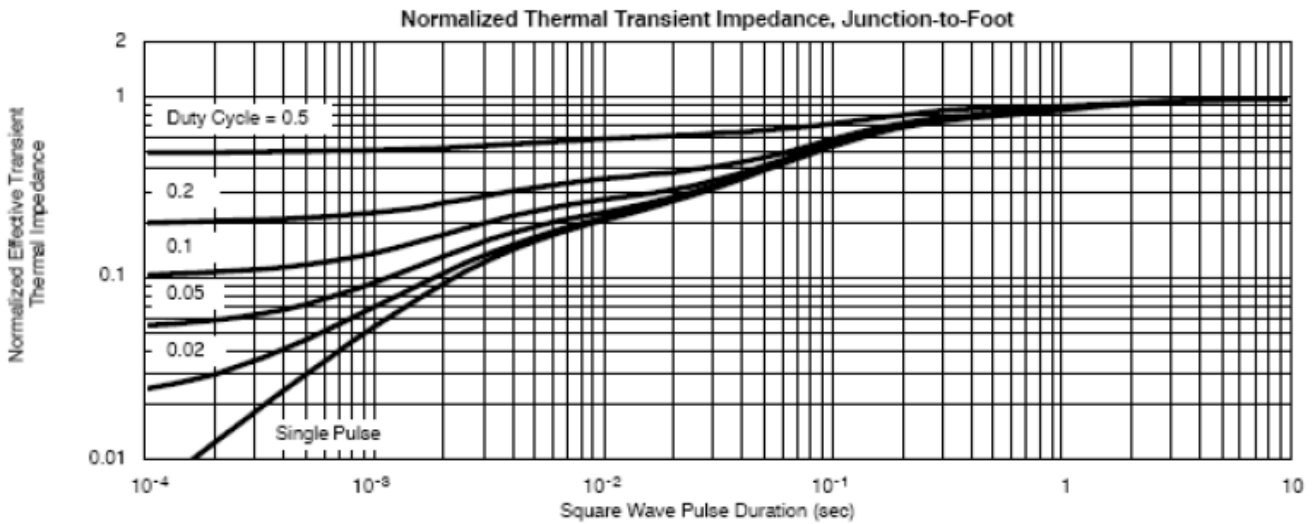
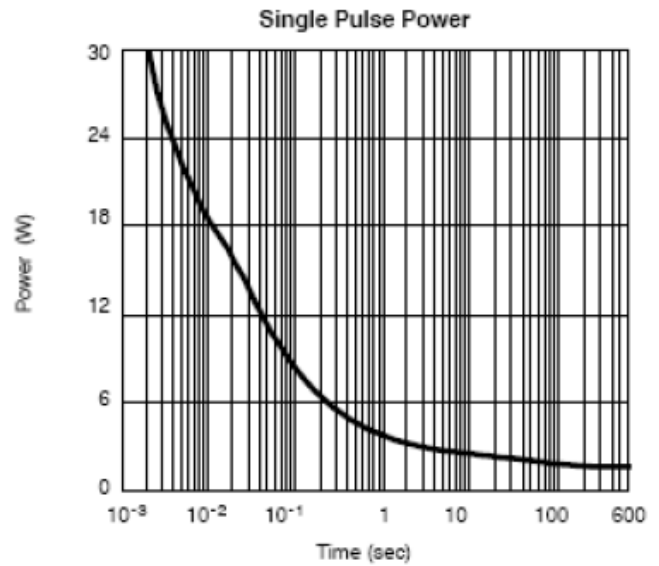
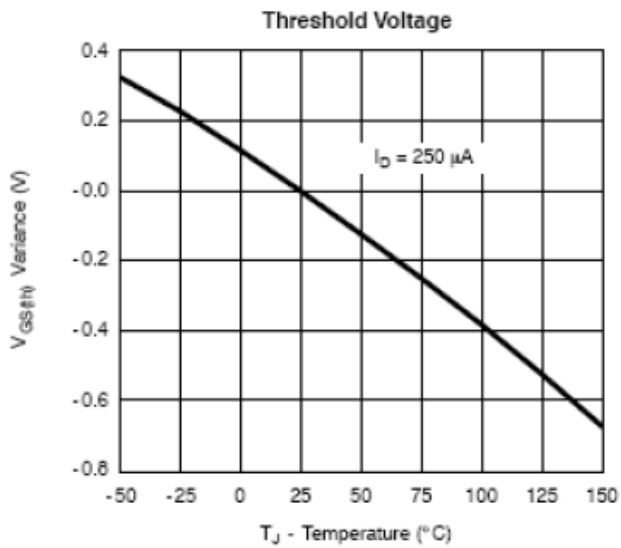




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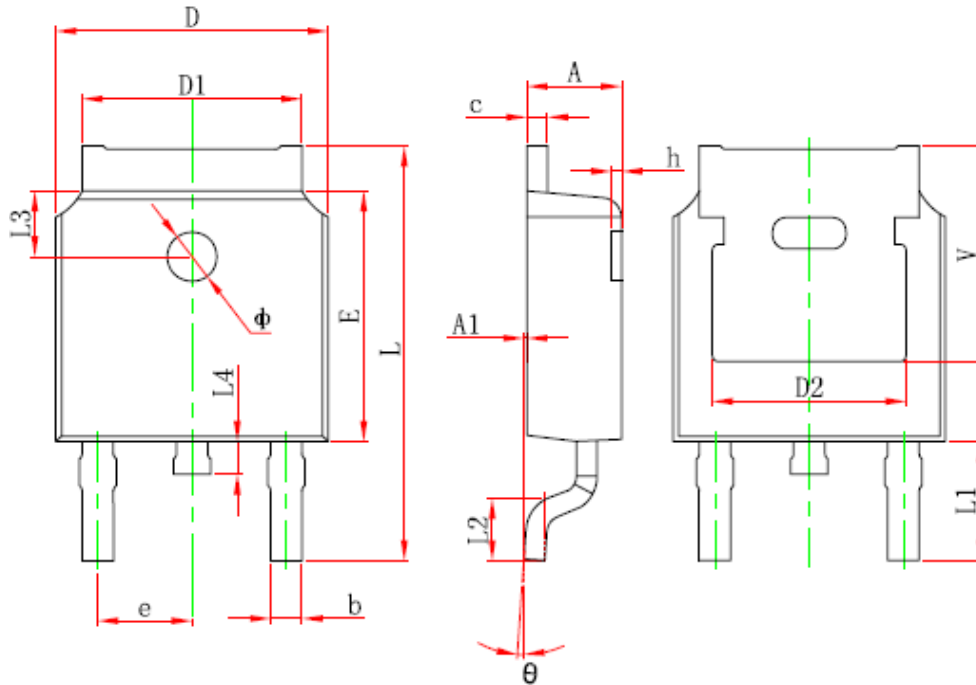




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### TO-252-2L PACKAGE OUTLINE



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 2.200                     | 2.400  | 0.087                | 0.094 |
| A1     | 0.000                     | 0.127  | 0.000                | 0.005 |
| b      | 0.660                     | 0.860  | 0.026                | 0.034 |
| c      | 0.460                     | 0.580  | 0.018                | 0.023 |
| D      | 6.500                     | 6.700  | 0.256                | 0.264 |
| D1     | 5.100                     | 5.460  | 0.201                | 0.215 |
| D2     | 4.830 REF.                |        | 0.190 REF.           |       |
| E      | 6.000                     | 6.200  | 0.236                | 0.244 |
| e      | 2.186                     | 2.386  | 0.086                | 0.094 |
| L      | 9.800                     | 10.400 | 0.386                | 0.409 |
| L1     | 2.900 REF.                |        | 0.114 REF.           |       |
| L2     | 1.400                     | 1.700  | 0.055                | 0.067 |
| L3     | 1.600 REF.                |        | 0.063 REF.           |       |
| L4     | 0.600                     | 1.000  | 0.024                | 0.039 |
| φ      | 1.100                     | 1.300  | 0.043                | 0.051 |
| θ      | 0°                        | 8°     | 0°                   | 8°    |
| h      | 0.000                     | 0.300  | 0.000                | 0.012 |
| V      | 5.350 REF.                |        | 0.211 REF.           |       |



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