



# 30A, 60V N-CHANNEL TRENCH MOSFET

### DESCRIPTION

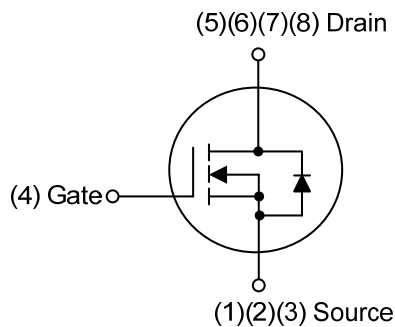
The UTC **UTN6266-L** is an N-Channel trench mosfet, it uses UTC's advanced technology to provide customers with a minimum on-state resistance, high switching speed and low gate charge.

The UTC **UTN6266-L** is suitable for Synchronous Rectification in DC/DC and AC/DC Converters and industrial and Motor Drive applications.

### FEATURES

- \*  $R_{DS(ON)} \leq 15 \text{ m}\Omega$  @  $V_{GS}=10\text{V}$ ,  $I_D=20\text{A}$
- \*  $R_{DS(ON)} \leq 19 \text{ m}\Omega$  @  $V_{GS}=4.5\text{V}$ ,  $I_D=18\text{A}$
- \* Low gate charge
- \* Low  $R_{DS(ON)}$
- \* High switching speed

### SYMBOL

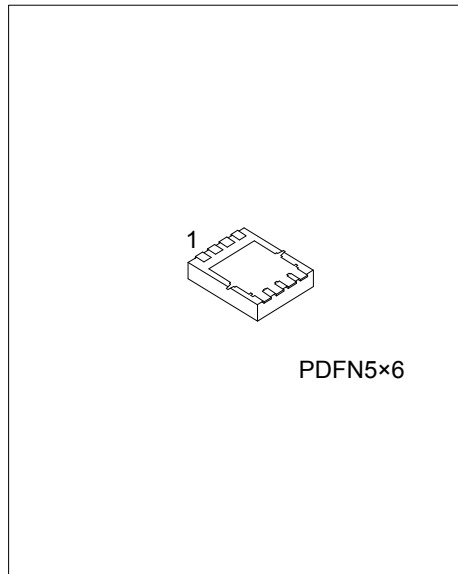


### ORDERING INFORMATION

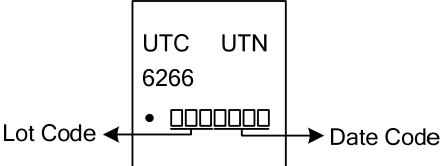
| Ordering Number  |                  | Package | Pin Assignment |   |   |   |   |   |   |   | Packing   |
|------------------|------------------|---------|----------------|---|---|---|---|---|---|---|-----------|
| Lead Free        | Halogen Free     |         | 1              | 2 | 3 | 4 | 5 | 6 | 7 | 8 |           |
| UTN6266L-P5060-R | UTN6266G-P5060-R | PDFN5×6 | S              | S | S | G | D | D | D | D | Tape Reel |

Note: Pin Assignment: G: Gate D: Drain S: Source

|  |  |
|--|--|
| <p>UTN6266G-P5060-R</p> <p>(1) Packing Type</p> <p>(2) Package Type</p> <p>(3) Green Package</p> | <p>(1) R: Tape Reel</p> <p>(2) P5060: PDFN5×6</p> <p>(3) G: Halogen Free and Lead Free, L: Lead Free</p> |
|--|--|



MARKING



■ ABSOLUTE MAXIMUM RATINGS ( $T_C=25^\circ\text{C}$ , unless otherwise specified)

| PARAMETER                    | SYMBOL     | RATINGS    | UNIT             |
|------------------------------|------------|------------|------------------|
| Drain-Source Voltage         | $V_{DSS}$  | 60         | V                |
| Gate-Source Voltage          | $V_{GSS}$  | $\pm 20$   | V                |
| Drain Current                | Continuous | $I_D$      | 30               |
|                              | Pulsed     | $I_{DM}$   | 90               |
| Avalanche Current (Note 3)   | $I_{AS}$   | 20         | A                |
| Avalanche Energy (Note 2, 3) | $E_{AS}$   | 280        | mJ               |
| Power Dissipation            | $P_D$      | 1.92       | W                |
| Junction Temperature         | $T_J$      | +150       | $^\circ\text{C}$ |
| Storage Temperature Range    | $T_{STG}$  | -55 ~ +150 | $^\circ\text{C}$ |

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Single pulse width by junction temperature  $T_{J(max)}=150^\circ\text{C}$ .

3.  $L=1.4\text{mH}$ ,  $I_{AS}=20\text{A}$ ,  $V_{DD}=50\text{V}$ ,  $R_G=25\Omega$ , Starting  $T_J=25^\circ\text{C}$

■ THERMAL CHARACTERISTICS

| PARAMETER           | SYMBOL        | RATINGS | UNIT               |
|---------------------|---------------|---------|--------------------|
| Junction to Ambient | $\theta_{JA}$ | 65      | $^\circ\text{C/W}$ |
| Junction to Case    | $\theta_{JC}$ | 12      | $^\circ\text{C/W}$ |

Notes: 1. The  $\theta_{JA}$  is the sum of the thermal impedance from junction to case  $\theta_{JC}$  and case to ambient.

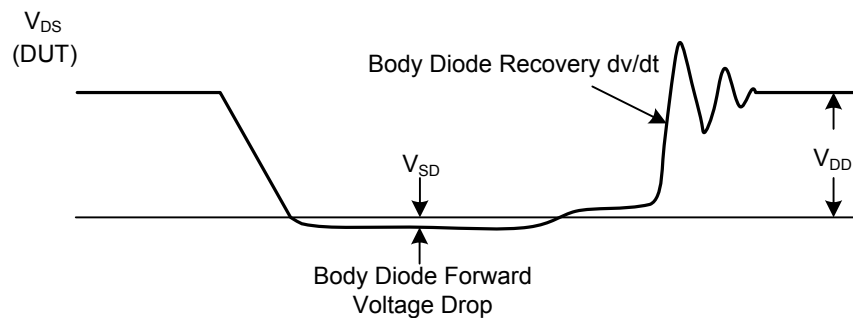
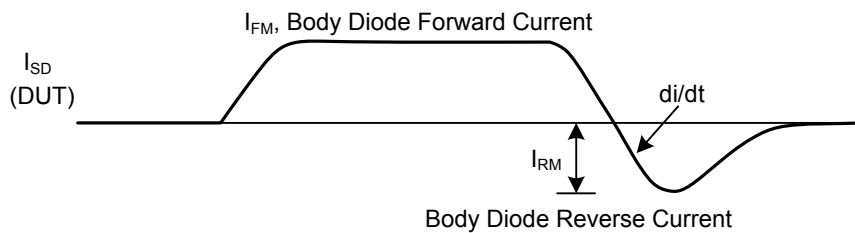
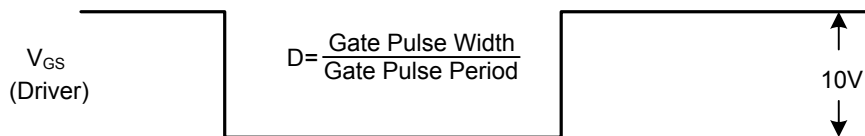
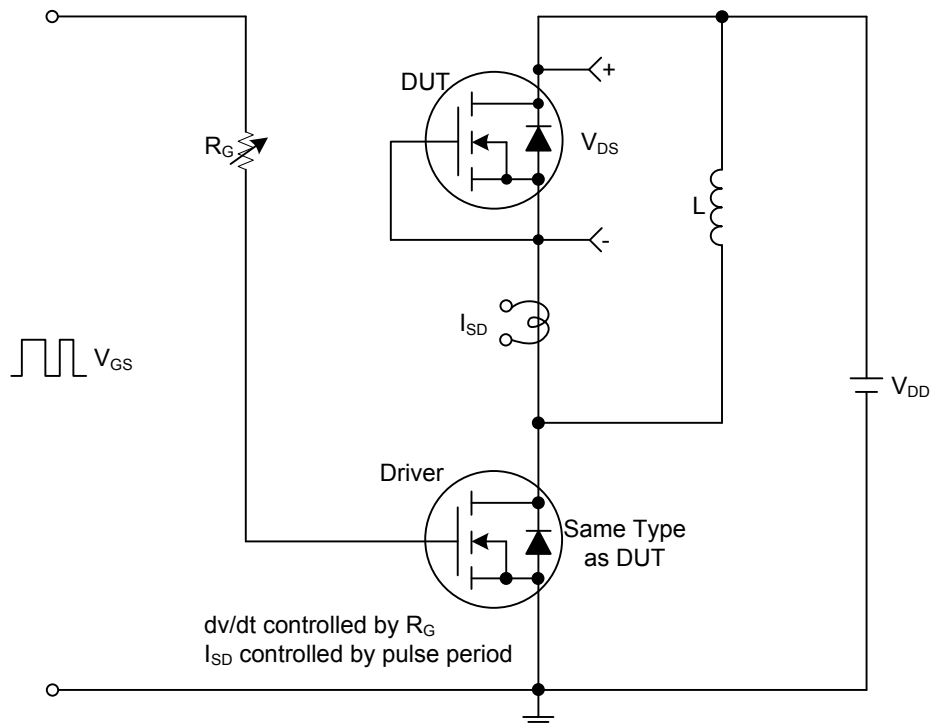
2. The value of  $\theta_{JA}$  is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper.

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

| PARAMETER  | SYMBOL       | TEST CONDITIONS  | MIN | TYP  | MAX  | UNIT             |
|--|--------------|--|-----|------|------|------------------|
| <b>OFF CHARACTERISTICS</b>                             |              |  |     |      |      |                  |
| Drain-Source Breakdown Voltage                         | $BV_{DSS}$   | $I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$  | 60  |      |      | V                |
| Zero Gate Voltage Drain Current                        | $I_{DSS}$    | $V_{DS}=60\text{V}$ , $V_{GS}=0\text{V}$   |     |      | 1    | $\mu\text{A}$    |
|  |              | $V_{DS}=60\text{V}$ , $V_{GS}=0\text{V}$ , $T_J=55^\circ\text{C}$                  |     |      | 5    | $\mu\text{A}$    |
| Gate-Body Leakage Current                              | Forward      | $I_{GSS}$  |     |      | +100 | nA               |
|  | Reverse      |  |     |      |      |                  |
| <b>ON CHARACTERISTICS</b>                              |              |  |     |      |      |                  |
| Gate Threshold Voltage                                 | $V_{GS(TH)}$ | $V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$   | 1.0 |      | 2.5  | V                |
| Static Drain-Source On-State Resistance                | $R_{DS(ON)}$ | $V_{GS}=10\text{V}$ , $I_D=20\text{A}$   |     | 12   | 15   | $\text{m}\Omega$ |
|  |              | $V_{GS}=10\text{V}$ , $I_D=20\text{A}$ , $T_J=125^\circ\text{C}$                   |     | 20.5 | 25   | $\text{m}\Omega$ |
|  |              | $V_{GS}=4.5\text{V}$ , $I_D=18\text{A}$  |     | 15   | 19   | $\text{m}\Omega$ |
| <b>DYNAMIC PARAMETERS</b>                              |              |  |     |      |      |                  |
| Input Capacitance                                      | $C_{ISS}$    | $V_{GS}=0\text{V}$ , $V_{DS}=30\text{V}$ , $f=1.0\text{MHz}$                       |     | 390  |      | pF               |
| Output Capacitance                                     | $C_{OSS}$    |  |     | 190  |      | pF               |
| Reverse Transfer Capacitance                           | $C_{RSS}$    |  |     | 170  |      | pF               |
| Gate Resistance  | $R_G$        | $f=1.0\text{MHz}$  |     | 1.1  |      | $\Omega$         |
| <b>SWITCHING PARAMETERS</b>                            |              |  |     |      |      |                  |
| Total Gate Charge                                      | $Q_G$        | $V_{GS}=10\text{V}$ , $V_{DS}=30\text{V}$ , $I_D=20\text{A}$                       |     | 6    |      | nC               |
| Gate to Source Charge                                  | $Q_{GS}$     |  |     | 0.5  |      | nC               |
| Gate to Drain Charge                                   | $Q_{GD}$     |  |     | 0.5  |      | nC               |
| Turn-ON Delay Time                                     | $t_{D(ON)}$  | $V_{GS}=10\text{V}$ , $V_{DS}=30\text{V}$ , $R_L=1.5\Omega$ ,<br>$R_{GEN}=3\Omega$ |     | 60   |      | ns               |
| Rise Time  | $t_R$        |  |     | 75   |      | ns               |
| Turn-OFF Delay Time                                    | $t_{D(OFF)}$ |  |     | 500  |      | ns               |
| Fall-Time  | $t_F$        |  |     | 230  |      | ns               |
| <b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b> |              |  |     |      |      |                  |
| Maximum Body-Diode Continuous Current                  | $I_S$        |  |     |      | 30   | A                |
| Drain-Source Diode Forward Voltage (Note2)             | $V_{SD}$     | $I_S=1\text{A}$ , $V_{GS}=0\text{V}$   |     | 0.72 | 1    | V                |

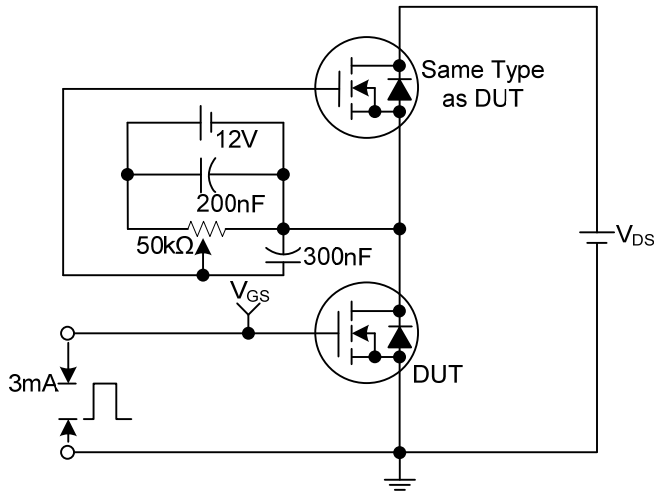
- Notes: 1. Pulse width limited by  $T_{J(MAX)}$   
 2. Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .  
 3. Surface Mounted on  $1\text{in}^2$  pad area.

■ TEST CIRCUITS AND WAVEFORMS

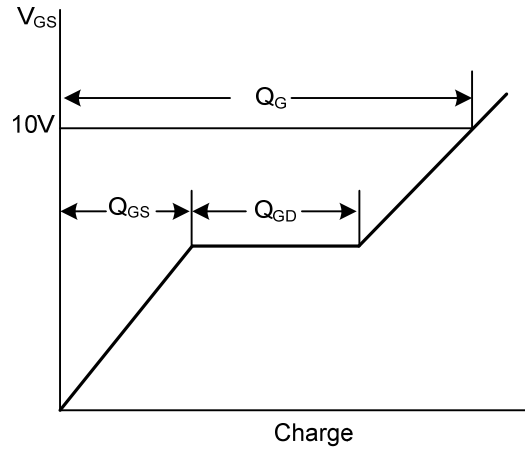


Peak Diode Recovery dv/dt Test Circuit and Waveforms

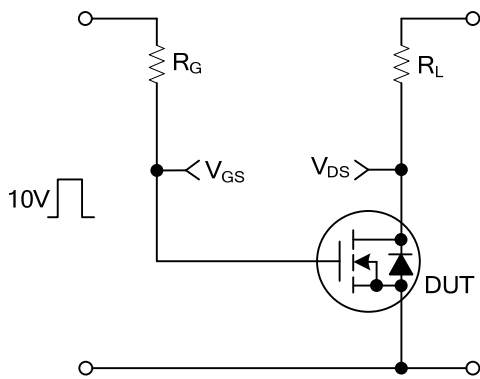
■ TEST CIRCUITS AND WAVEFORMS



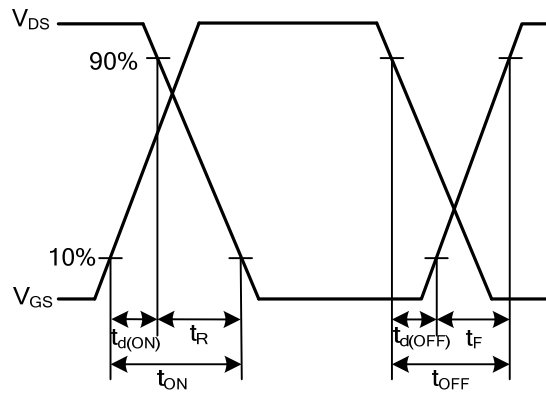
Gate Charge Test Circuit



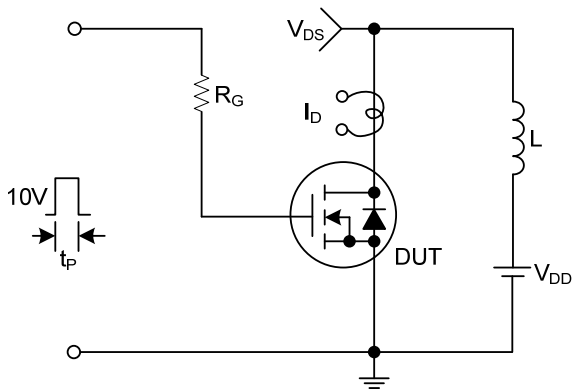
Gate Charge Waveforms



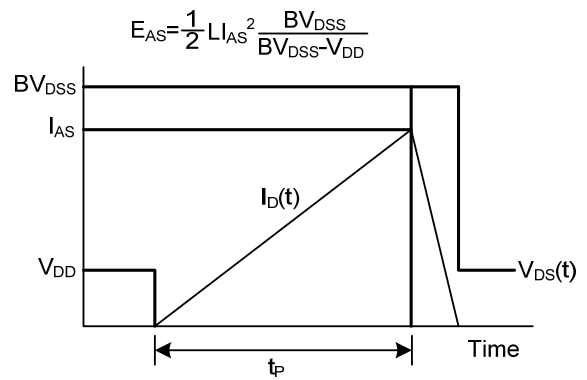
Resistive Switching Test Circuit



Resistive Switching Waveforms



Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

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