UNISONIC TECHNOLOGIES CO., LTD

UTD454 Power MOSFET

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

DESCRIPTION

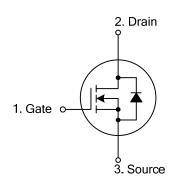
The UTC UTD454 is an N-channel enhancement MOSFET providing perfect $R_{\text{DS}(\text{ON})}$ and low gate charge with UTC advanced technology.

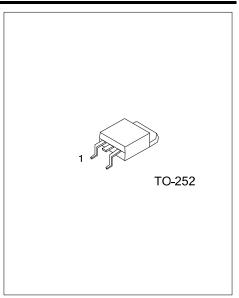
The UTC UTD454 is intended for being used in PWM, load switching and general purpose applications.

FEATURES

- * $R_{DS(ON)}$ < 33 m Ω @ V_{GS} = 10V
- * $R_{DS(ON)}$ < 47 m Ω @ V_{GS} = 4.5V
- * $V_{DS}(V) = 40V$
- * I_D = 12 A @V_{GS} = 10V
- * Low gate charge

SYMBOL





ORDERING INFORMATION

| Ordering Number | | Doolsone | Pin Assignment | | | Deaking |
|-----------------|---------------|-------------|----------------|---|---------|-----------|
| Lead Free | Halogen Free | Package 1 2 | | 3 | Packing | |
| UTD454L-TN3-R | UTD454G-TN3-R | TO-252 | G | D | S | Tape Reel |
| UTD454L-TN3-T | UTD454G-TN3-T | TO-252 | G | D | S | Tube |

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



ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|------------------|--------------------|------|
| Drain-Source Voltage | V_{DS} | 40 | V |
| Gate-Source Voltage | V_{GS} | ±20 | V |
| Continuous Drain Current (T _C =25°C) | I _D | 12 | Α |
| Pulsed Drain Current (Note 2) | I _{DM} | 30 | Α |
| Avalanche Current (Note 2) | I _{AR} | 12 | Α |
| Repetitive avalanche energy (L=0.1mH)(Note 2) | E _{AR} | 20 | mJ |
| Power Dissipation (T _C =25°C) | P_{D} | 20 | W |
| Junction Temperature | TJ | +150 | °C |
| Storage Temperature | T _{STG} | -55 ~ + 150 | °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.

THERMAL CHARACTERISTICS

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---------------------|---------------|---------|------|
| Junction to Ambient | θ_{JA} | 60 | °C/W |
| Junction to Case | θ_{JC} | 3 | °C/W |

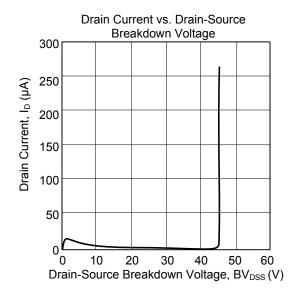
Note: Surface mounted on 1 in² copper pad of FR4 board with 2oz

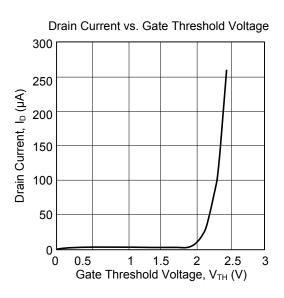
ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

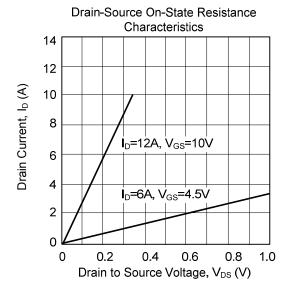
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT | | |
|--|---------------------|---|------|------|------|--------|--|--|
| OFF CHARACTERISTICS | | | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | $I_D=250\mu A, V_{GS}=0V$ | 40 | | | V | | |
| Drain-Source Leakage Current | I _{DSS} | V _{DS} =32V, V _{GS} =0V | | | 1 | μΑ | | |
| Gate-Source Leakage Current | I _{GSS} | V_{DS} =0V, V_{GS} =±20V | | | ±100 | nA | | |
| ON CHARACTERISTICS | | | | | | | | |
| Gate Threshold Voltage | $V_{GS(TH)}$ | $V_{DS}=V_{GS}$, $I_D=250\mu A$ | 1.8 | 2.3 | 3 | V | | |
| On-State Drain Current | I _{D(ON)} | V _{GS} =10V, V _{DS} =5V | 30 | | | Α | | |
| Drain to Course On atota Basistanas | 0 | V _{GS} =10V, I _D =12A | | 25 | 33 | mΩ | | |
| Drain to Source On-state Resistance | R _{DS(ON)} | V_{GS} =4.5V, I_D =6A | | 34 | 47 | mΩ | | |
| DYNAMIC PARAMETERS | | | | | | | | |
| Input Capacitance | C _{ISS} | | | 404 | 500 | pF | | |
| Output Capacitance | Coss | V _{GS} =0V, V _{DS} =20V, f=1MHz | | 95 | 150 | pF | | |
| Reverse Transfer Capacitance | C _{RSS} | | | 37 | 60 | nC | | |
| Gate resistance | R_{G} | V _{GS} =0V, V _{DS} =0V, f=1MHz | | 2.7 | | Ω | | |
| SWITCHING PARAMETERS | | | | | | | | |
| Turn-ON Delay Time | t _{D(ON)} | | | 3.5 | | ns | | |
| Turn-ON Rise Time | t _R | V_{GS} =10V, V_{DS} =20V, R_L =1.7 Ω , | | 6 | | ns | | |
| Turn-OFF Delay Time | t _{D(OFF)} | R _{GEN} =3Ω | | 13.2 | | ns | | |
| Turn-OFF Fall-Time | t _F | | | 3.5 | | ns | | |
| Total Gate Charge | Q_G | V _{GS} =10V, V _{DS} =20V, I _D =12A | | 9.2 | | nC | | |
| Gate Source Charge | Q_GS | | | 1.6 | | nC | | |
| Gate Drain Charge | Q_GD | 3 | | 2.6 | | nC | | |
| SOURCE-DRAIN DIODE RATINGS AND CHAR | RACTERIS | TICS | | | | | | |
| Drain-Source Diode Forward Voltage | V_{SD} | I _S =1A, V _{GS} =0V | | 0.76 | 1 | V | | |
| Diode Continuous Forward Current | Is | 18 108 | | | 12 | Α | | |
| Reverse Recovery Time | t _{rr} | 1 -42 A 4V4+100 AV4 | | 22.9 | | ns | | |
| verse Recovery Time t_{rr} V_{erse} Recovery Charge V_{erse} | | | 18.3 | | nC | | | |
| Reverse Recovery Charge Q_{RR} I_{E} =12A, dI/dt =100A/ μ s 18.3 nC Note: Pulse width \leq 300 μ s, duty cycle \leq 0.5%. | | | | | | | | |
| J. W. M. T. | | | | | | | | |
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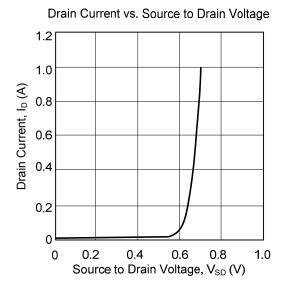
^{2.} Pulse width limited by T_{J(MAX)}

■ TYPICAL CHARACTERISTICS









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