

UTT36N05

Preliminary

36A, 50V N-CHANNEL ENHANCEMENT MODE POWER MOSFET TRANSISTOR

DESCRIPTION

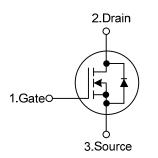
The UTC **UTT36N05** is an N-channel enhancement power MOSFET using UTC's advanced technology to provide the customers with perfect $R_{DS(ON)}$, high switching speed, high current capacity and low gate charge.

The UTC **UTT36N05** is suitable for motor control, AC-DC or DC-DC converters and audio amplifiers, etc.

FEATURES

- * $R_{DS(ON)}$ =33m Ω @ V_{GS} =5V, I_D =18A
- * High Switching Speed
- * High Current Capacity
- * Low Gate Charge(typical 35nC)

SYMBOL

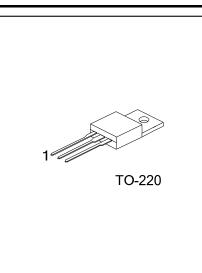


ORDERING INFORMATION

| Ordering Number | | Daakaga | Pin Assignment | | | Deaking | |
|-----------------|-----------------|---------|----------------|---|---|---------|--|
| Lead Free | Halogen Free | Package | 1 | 2 | 3 | Packing | |
| UTT36N05L-TA3-T | UTT36N05G-TA3-T | TO-220 | G | D | S | Tube | |

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

| UTT36N05L-TA3-T | (1) T: Tube |
|-----------------|-----------------------------------|
| (2)Package Type | (2) TA3: TO-220 |
| (3)Lead Free | (3) G: Halogen Free, L: Lead Free |
| | |



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

| | PARAMETER | | SYMBOL | RATINGS | UNIT |
|--------------------|---------------------------|-----------------------|------------------|---|------|
| Drain-Source Volta | age (V _{GS} =0) | | V _{DSS} | 50 | V |
| Drain-Gate Voltage | e (R _{GS} =20kΩ) | | V _{DGR} | 50 | V |
| Gate-Source Volta | irce Voltage | | V _{GSS} | $ \begin{array}{c c} I_{GSS} & \pm 15 \\ I_{D} & 36 \\ \hline 25 \\ \hline 100 & 100 \\ \hline 100 & 100$ | |
| | Continuous | T _C =25°C | | 36 | Α |
| Drain Current | Continuous | T _C =100°C | ID | 25 | Α |
| Pulsed (Note 2) | | I _{DM} | 144 | А | |
| | | Single Pulsed | E _{AS} | 240 | mJ |
| Avalanche Energy | | Repetitive | E _{AR} | 60 | mJ |
| Power Dissipation | (T _C =25°C) | | PD | 100 | W |
| Junction Temperat | nction Temperature | | TJ | T _J 150 | |
| Storage Temperati | ure | | T _{STG} | -65~175 | °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. Pulse width limited by safe operating area

THERMAL DATA

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---------------------|-----------------|---------|------|
| Junction to Ambient | θ_{JA} | 62.5 | °C/W |
| Junction to Case | θ _{JC} | 1.25 | °C/W |



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

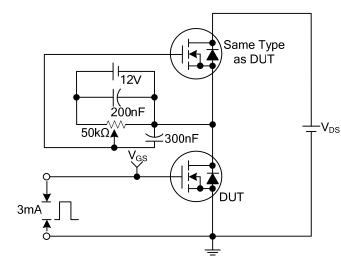
| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---|----------------------|---|-----|-------|------|------|
| OFF CHARACTERISTICS | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | I _D =250µA, V _{GS} =0V | | | | V |
| Drain Source Lookage Current | I _{DSS} | V _{DS} =Max Rating, V _{GS} =0V | | | 1 | |
| Drain-Source Leakage Current | | V_{DS} = Max ×0.8, T_{C} =125°C, V_{GS} =0V | | | 10 | μA |
| Gate- Source Leakage Current | GSS | V _{GS} =+15V, V _{DS} =0V | | | +100 | nA |
| Reverse | | V _{GS} =-15V, V _{DS} =0V | | | -100 | nA |
| ON CHARACTERISTICS (Note 1) | | | - | | | |
| Gate Threshold Voltage | V _{GS(TH)} | V _{DS} =V _{GS} , I _D =250µA | 1 | 1.6 | 2.5 | V |
| Static Drain-Source On-State Resistance | R _{DS(ON)} | V _{GS} =5V, I _D =18A | | 0.033 | 0.04 | Ω |
| On State Drain Current | I _{D(ON)} | V _{DS} >I _{D(ON)} ×R _{DS(ON)} max, V _{GS} =10V | 36 | | | А |
| DYNAMIC PARAMETERS | | | | | | |
| Input Capacitance | CISS | | | 1350 | 1800 | рF |
| Output Capacitance | C _{OSS} | V _{GS} =0V, V _{DS} =25V, f=1.0MHz | | 450 | 600 | рF |
| Reverse Transfer Capacitance | C _{RSS} | | | 130 | 200 | pF |
| SWITCHING PARAMETERS | | | | | | |
| Total Gate Charge | Q_{G} | | | 35 | 50 | nC |
| Gate to Source Charge | Q_{GS} | V _{GS} =5V, V _{DS} =40V, I _D =36A | | 11 | | nC |
| Gate to Drain Charge | Q_{GD} | | | 19 | | nC |
| Turn-ON Delay Time | t _{D(ON)} | -V _{DD} =25V, I _D =18A, R _G =50Ω, V _{GS} =5V | | 90 | 130 | ns |
| Rise Time | t _R | | | 550 | 800 | ns |
| OFF-Voltage Rise Time | t _{R(VOFF)} | V _{DD} =40V, I _D =36A, R _G =50Ω, V _{GS} =5V | | 110 | 160 | ns |
| Fall-Time | t _F | | | 180 | 260 | ns |
| Cross-Over Time | t _c | | | 310 | 450 | ns |
| SOURCE- DRAIN DIODE RATINGS AND (| CHARACTE | RISTICS | - | | | |
| Maximum Body-Diode Continuous Current | ls | | | | 36 | А |
| Maximum Body-Diode Pulsed Current | I _{SM} | (Note 2) | | | 144 | Α |
| Drain-Source Diode Forward Voltage | V_{SD} | I _{SD} =36A, V _{GS} =0V (Note 1) | | | 1.6 | V |
| Body Diode Reverse Recovery Time | t _{RR} | | | 100 | | ns |
| Body Diode Reverse Recovery Charge | Q_{RR} | I _{SD} =36A, V _{DD} =30V, di/dt=100A/µs, −T _J = 150°C | | 0.27 | | μC |
| Body Diode Reverse Recovery Current | I _{RRM} | 11 = 100 0 | | 5.5 | | А |

Notes: 1. Pulsed: Pulse duration = 300 ms, duty cycle 1.5%

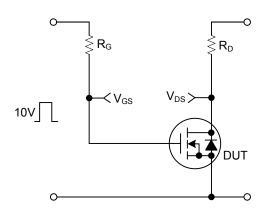
2. Pulse width limited by safe operating area



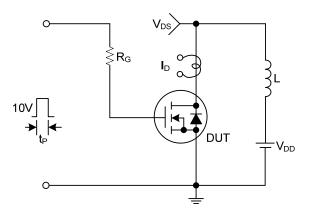
TEST CIRCUITS AND WAVEFORMS



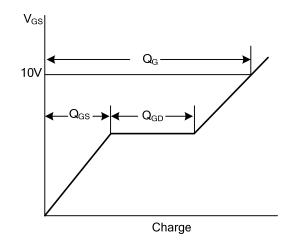
Gate Charge Test Circuit



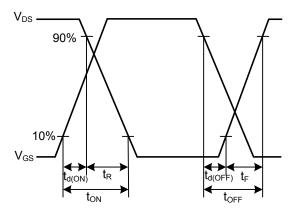
Resistive Switching Test Circuit



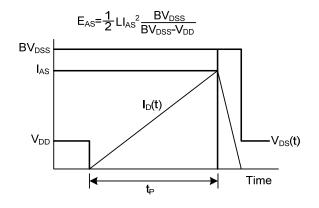
Unclamped Inductive Switching Test Circuit



Gate Charge Waveforms



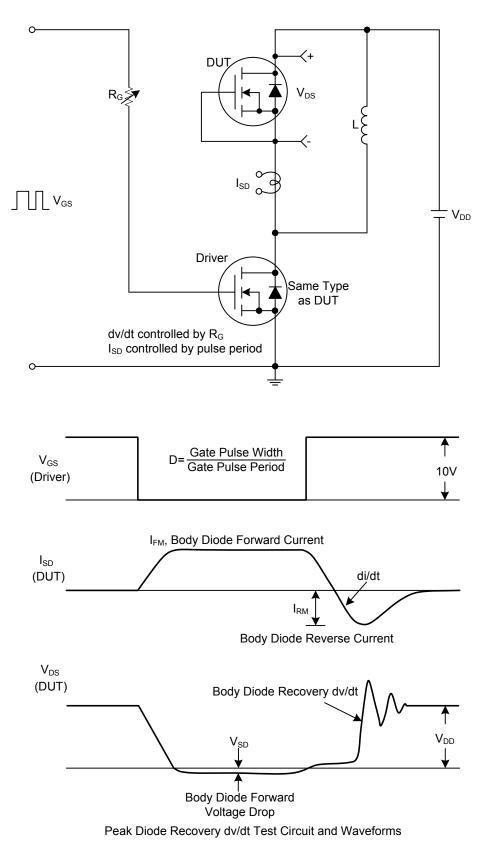
Resistive Switching Waveforms



Unclamped Inductive Switching Waveforms



TEST CIRCUITS AND WAVEFORMS(Cont.)





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