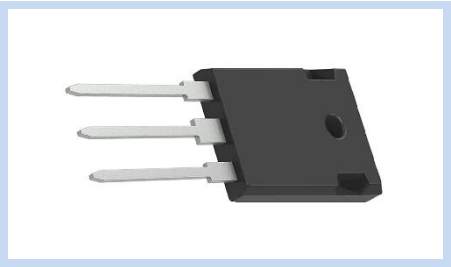
# N-Channel MOSFET
# 650V 26A TO-247

MFT65N26T247

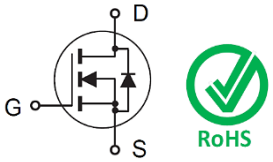
MERITEK

## FEATURE



- $R_{DS(ON)} \leqq 130m\Omega$ at $V_{GS}=10V$
- Low On-Resistance and Low Conduction Losses
- Ultra Low Gate Charge
- Super Fast Reverse Recovery Speed
- Application: Power Factor Correction, Switched Mode Power Supplies, Uninterruptible Power Supply, On-Board Charger

## MECHANICAL DATA




- Case: TO-247 Package
- Terminals: Solderable per MIL-STD-202, Method 208

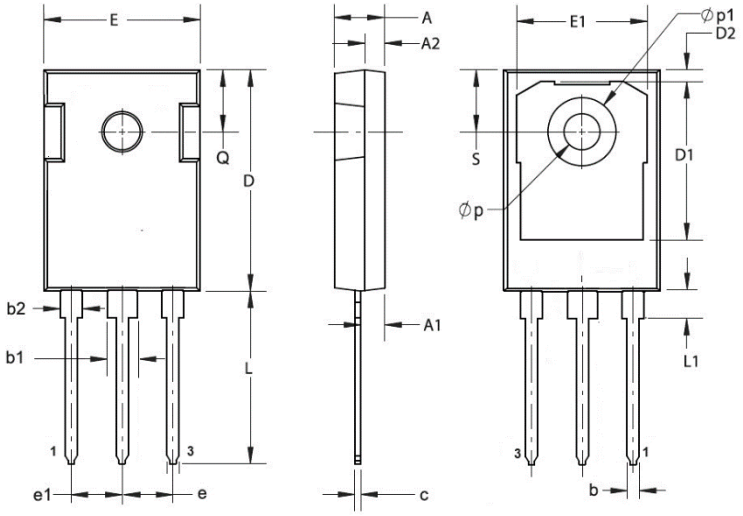
## MAXIMUM RATINGS

| Parameter | | Symbol | Value | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 650 | V |
| Gate-Source Voltage | AC (f >1 Hz) | $V_{GS}$ | ±30 | V |
| | DC | | ±20 | |
| Drain Current – Continuous | DC, TC=25°C | $I_D$ | 26 | A |
| | DC, TC=100°C | | 18.2 | A |
| Drain Current – Pulsed | | $I_{DM}$ | 78 | A |
| Power Dissipation | | $P_D$ | 237 | W |
| Single Pulsed Avalanche Current | | $I_{AS}$ | 7 | A |
| Thermal Resistance Junction to Ambient | | $R_{\theta JA}$ | 62 | °C/W |
| Thermal Resistance Junction to Case | | $R_{\theta JC}$ | 0.63 | °C/W |
| Operating Junction Temperature | | $T_J$ | 175 | °C |
| Storage Temperature Range | | $T_{STG}$ | -55 to 175 | °C |

## DIMENSIONS

| Item | Min (mm) | Max (mm) |
|---|---|---|
| A | 4.90 | 5.10 |
| A1 | 2.31 | 2.51 |
| A2 | 1.90 | 2.10 |
| b | 1.16 | 1.26 |
| b1 | 2.96 | 3.06 |
| b2 | 1.96 | 2.06 |
| c | 0.59 | 0.66 |
| D | 20.90 | 21.10 |
| D1 | 16.25 | 16.85 |
| e/e1 | 5.346 BSC | |
| E | 15.70 | 15.90 |
| E1 | 13.10 | 13.50 |
| L | 19.80 | 20.10 |
| L1 | - | 4.30 |
| p | 3.40 | 3.60 |
| p1 | 7.00 | 7.40 |
| Q | 5.39 | 6.20 |

Note: Pin Layout: 1:Gate(G), 2:Drain(D), 3:Source(S)

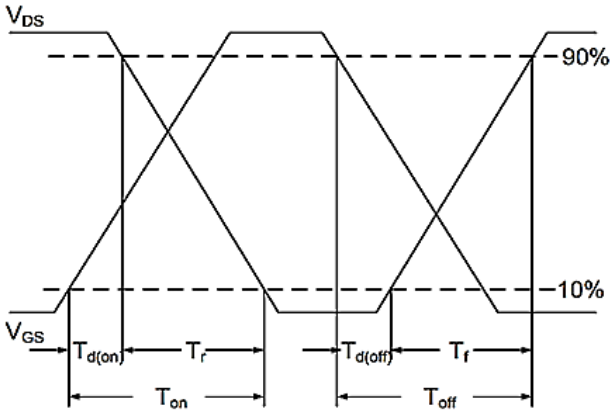


## ELECTRICAL CHARACTERISTICS

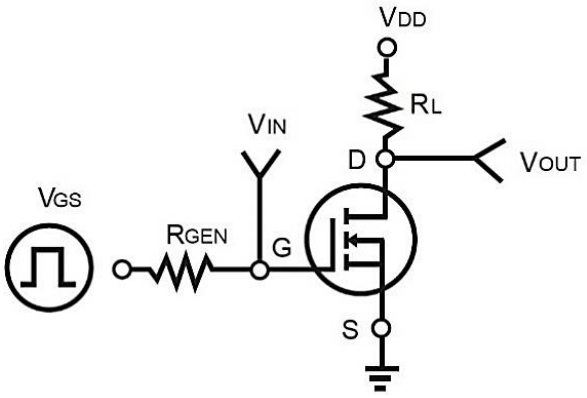
| Off Characteristics | Conditions | Symbol | Min | Typ. | Max | Unit |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_D$=250μA | $BV_{DSS}$ | 650 | -- | -- | V |
| Drain-Source Leakage Current | $V_{DS}$=650V, $V_{GS}$=0V | $I_{DSS}$ | -- | -- | 10 | μA |
| Gate-Body Leakage Current | $V_{GS}$=±30V, $V_{DS}$=0V | $I_{GSS}$ | -- | -- | ±100 | nA |
| **On Characteristics** | **Conditions** | **Symbol** | **Min** | **Typ.** | **Max** | **Unit** |
| Static Drain-Source On-Resistance | $V_{GS}$=10V, $I_D$=13A | $R_{DS(ON)}$ | -- | 110 | 130 | mΩ |
| Gate Threshold Voltage | $V_{GS}$=$V_{DS}$, $I_D$=500μA | $V_{GS(th)}$ | 3.5 | 4.2 | 5.0 | V |
| **Dynamic Characteristics** | **Conditions** | **Symbol** | **Min** | **Typ.** | **Max** | **Unit** |
| Total Gate Charge | $V_{DS}$=480V, $V_{GS}$=10V, $I_D$=13A | $Q_g$ | -- | 41.2 | -- | nC |
| Gate-Source Charge | | $Q_{gs}$ | -- | 16.3 | -- | |
| Gate-Drain Charge | | $Q_{gd}$ | -- | 12.8 | -- | |
| Gate Plateau Voltage | | $V_{gp}$ | -- | 7.0 | -- | V |
| Turn-On Delay Time | $V_{DD}$=380V, $V_{GS}$=10V, $R_G$=1.7Ω $I_D$=13A | $T_{d(on)}$ | -- | 43 | -- | ns |
| Rise Time | | $T_r$ | -- | 16 | -- | |
| Turn-Off Delay Time | | $T_{d(off)}$ | -- | 93 | -- | |
| Fall Time | | $T_f$ | -- | 20 | -- | |
| Input Capacitance | $V_{DS}$=50V, $V_{GS}$=0V, F=1MHz | $C_{iss}$ | -- | 2161 | -- | pF |
| Output Capacitance | | $C_{oss}$ | -- | 95 | -- | |
| Reverse Transfer Capacitance | | $C_{rss}$ | -- | 50 | -- | |
| Gate Resistance | F=1MHz, Open Drain | $R_G$ | -- | 1.5 | -- | Ω |
| **Drain-Source Body Diode** | **Conditions** | **Symbol** | **Min** | **Typ.** | **Max** | **Unit** |
| Drain-Source Diode Forward Current | -- | $I_S$ | -- | -- | 26 | A |
| Diode Forward Voltage | $V_{GS}$=0V, $I_S$=26A, $T_J$=25°C | $V_{SD}$ | -- | -- | 1.2 | V |
| Reverse Recovery Time | $I_D$ =13A,$di_F$/dt = 100A/μs, $T_J$=25°C | $T_{rr}$ | -- | 145 | -- | ns |
| Reverse Recovery Charge | | $Q_{rr}$ | -- | 0.725 | -- | μC |
| Peak Reverse Recovery Current | | $I_{rr}$ | -- | 10 | -- | A/μs |

Note:
1. Repetitive Rating: Pulse width limited by maximum junction temperature.

### Switching Time Waveform

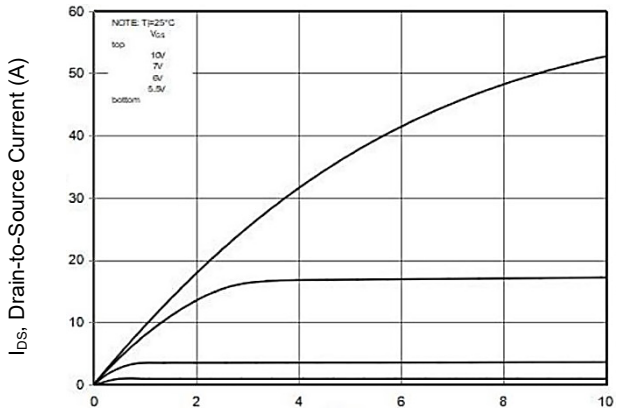



### Switching Test Circuit



# CHARACTERISTIC CURVES

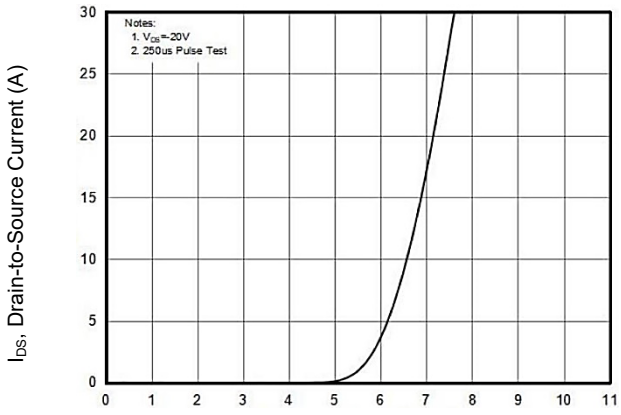
### Output Characteristics




$I_{DS}$, Drain-to-Source Current (A)

$V_{DS}$, Drain-to-Source Voltage (V)

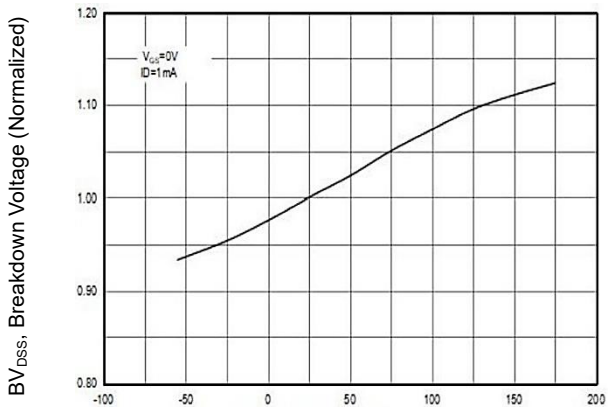
### Transfer Characteristics




$I_{DS}$, Drain-to-Source Current (A)

$V_{GS}$, Gate-to-Source Voltage (V)

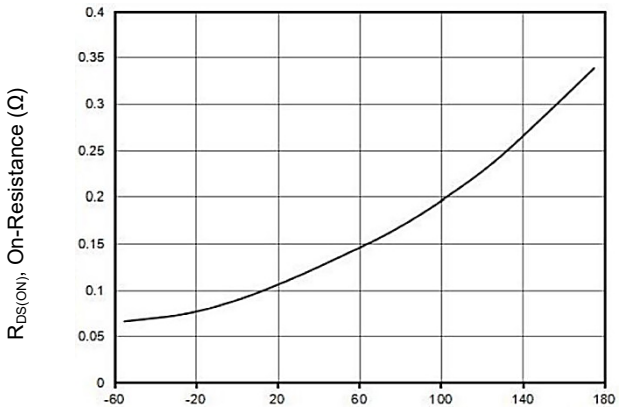
### Breakdown Voltage vs. Temperature




$BV_{DSS}$, Breakdown Voltage (Normalized)

Temperature (°C)

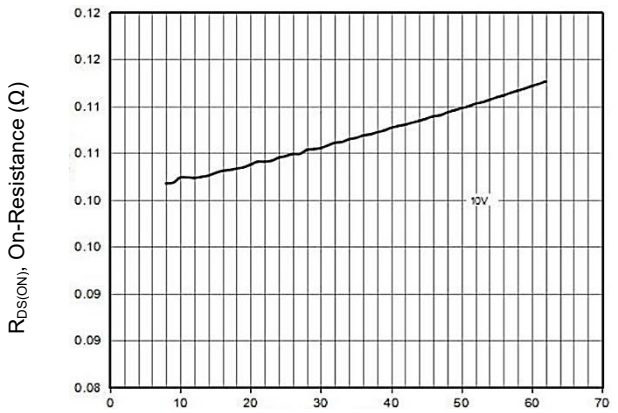
### On-Resistance vs. Junction temperature




$R_{DS(ON)}$, On-Resistance (Ω)

Temperature (°C)

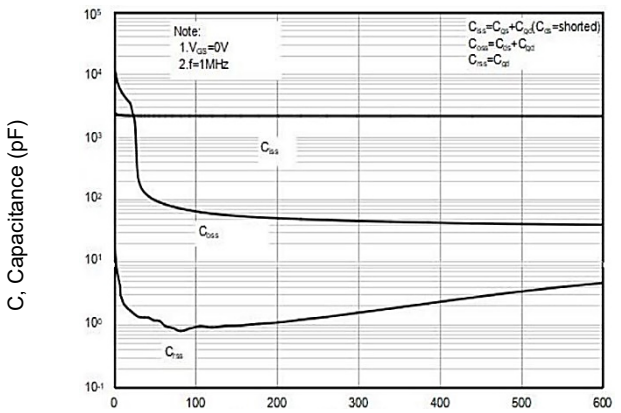
### On-Resistance vs. Drain Current




$R_{DS(ON)}$, On-Resistance (Ω)

$I_{DS}$, Drain to Source Current (A)

### Capacitance

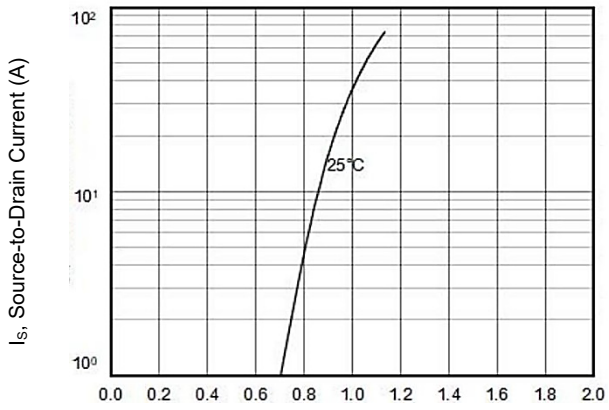



C, Capacitance (pF)

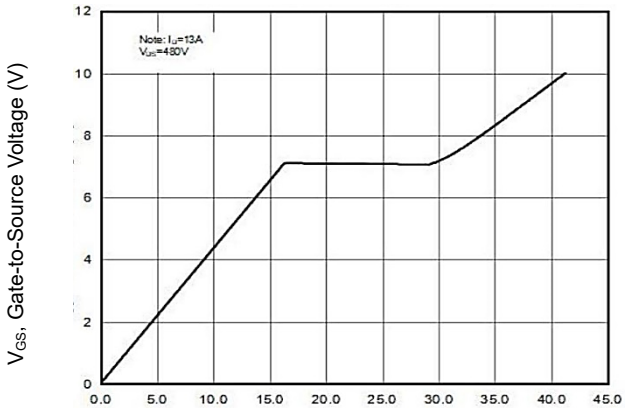
$V_{DS}$, Drain-to-Source Voltage (V)

## CHARACTERISTIC CURVES

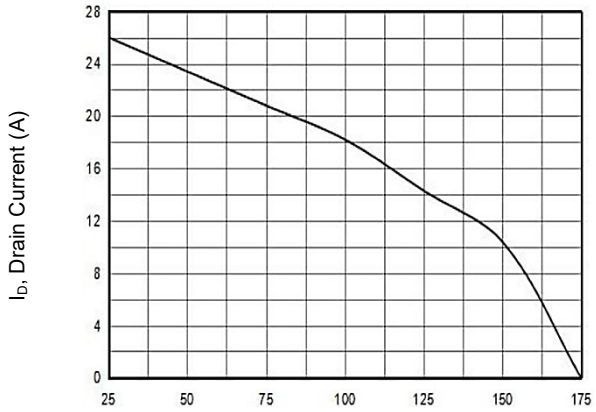
**Body Diode Forward Voltage**




**Gate Charge**




**Current Dissipation**




**Maximum Safe Operating Area**