# UMW AOD2922

100V N-Channel MOSFET

## 1.Description

- Very Low $R_{DS(ON)}$
- Low Gate Charge
- Optimized for fast-switching applications

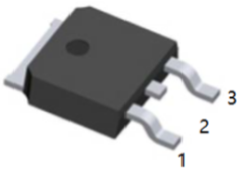
## 2.Features

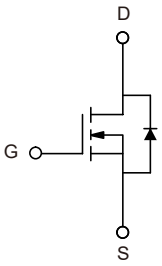
- $V_{DS\ (V)}$=100V
- $I_D$=7A($V_{GS}$=10V)
- $R_{DS(ON)}$<140mΩ($V_{GS}$=10V)
- $R_{DS(ON)}$<176mΩ($V_{GS}$=4.5V)

## 3.Pinning information

| Pin | Symbol | Description |
|---|---|---|
| 1 | G | GATE |
| 3 | S | SOURCE |
| 2 | D | DRAIN |

**TO-252(DPAK)**
**top view**




## 4.Absolute Maximum Ratings $T_A$= 25°C

| Parameter | | Symbol | Rating | Units |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 100 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±20 | |
| Continuous Drain Current | $T_C$=25°C | $I_D$ | 7 | A |
| | $T_C$=100°C | | 5 | |
| Pulsed Drain Current [c] | | $I_{DM}$ | 10 | |
| Continuous Drain Current | $T_A$=25°C | $I_{DSM}$ | 3.5 | |
| | $T_A$=70°C | | 3 | |
| Avalanche Current [c] | | $I_{AS}$ | 3 | |
| Avalanche energy L=0.1mH [c] | | $E_{AS}$ | 0.5 | mJ |
| $V_{DS}$ Spike | 10μs | $V_{SPIKE}$ | 120 | V |
| Power Dissipation [B] | $T_C$=25°C | $P_D$ | 17 | W |
| | $T_C$=100°C | | 8.5 | |
| Power Dissipation [A] | $T_A$=25°C | $P_{DSM}$ | 5 | |
| | $T_A$=70°C | | 3.2 | |
| Junction and Storage Temperature Range | | $T_J$, $T_{STG}$ | -55 to 175 | °C |

## 5.Thermal Characteristics

| Parameter | | Symbol | Typ | Max | Units |
|---|---|---|---|---|---|
| Maximum Junction-to-Ambient [A] | t ≤ 10s | $R_{\theta JA}$ | 20 | 25 | °C/W |
| Maximum Junction-to-Ambient [AD] | Steady-State | | 40 | 50 | °C/W |
| Maximum Junction-to-Case | Steady-State | $R_{\theta JC}$ | 7.3 | 8.8 | °C/W |

## 6.Electrical Characteristic ($T_J$=25°C unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $I_D$=250μA, $V_{GS}$=0V | 100 | | | V |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=100V, $V_{GS}$=0V | | | 1 | μA |
| | | $T_J$=55°C | | | 5 | μA |
| Gate-Body leakage current | $I_{GSS}$ | $V_{DS}$=0V, $V_{GS}$=±20V | | | ±100 | nA |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$, $I_D$=250μA | 1.7 | 2.2 | 2.7 | V |
| Static Drain-Source On-Resistance | $R_{DS(ON)}$ | $V_{GS}$=10V, $I_D$=5A | | 117 | 140 | mΩ |
| | | $V_{GS}$=4.5V, $I_D$=3A | | 140 | 176 | mΩ |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=5V, $I_D$=5A | | 8.5 | | S |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=1A, $V_{GS}$=0V | | 0.8 | 1.1 | V |
| Maximum Body-Diode Continuous Current | $I_S$ | | | | 7 | A |
| Input Capacitance | $C_{iss}$ | $V_{GS}$=0V, $V_{DS}$=50V, f=1MHz | | 250 | 310 | pF |
| Output Capacitance | $C_{oss}$ | | | 19 | 30 | pF |
| Reverse Transfer Capacitance | $C_{rss}$ | | | 2.5 | 8 | pF |
| Gate resistance | $R_g$ | f=1MHz | 5 | 10.5 | 16 | Ω |
| Total Gate Charge | $Q_g$(10V) | $V_{GS}$=10V, $V_{DS}$=50V, $I_D$=5A | | 3.8 | 10 | nC |
| Total Gate Charge | $Q_g$(4.5V) | | | 1.8 | 6 | nC |
| Gate Source Charge | $Q_{gs}$ | | | 0.8 | | nC |
| Gate Drain Charge | $Q_{gd}$ | | | 0.8 | | nC |
| Turn-On DelayTime | $t_{D(on)}$ | $V_{GS}$=10V, $V_{DS}$=50V, $R_L$=10Ω, $R_{GEN}$=3Ω | | 5 | | ns |
| Turn-On Rise Time | $t_r$ | | | 3 | | ns |
| Turn-Off DelayTime | $t_{D(off)}$ | | | 19 | | ns |
| Turn-Off Fall Time | $t_f$ | | | 5 | | ns |
| Body Diode Reverse Recovery Time | $t_{rr}$ | $I_F$=5A, dI/dt=500A/μs | | 16 | | ns |
| Body Diode Reverse Recovery Charge | $Q_{rr}$ | $I_F$=5A, dI/dt=500A/μs | | 52 | | nC |

A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in$^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A$ =25°C. The Power dissipation $P_{DSM}$ is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design, and the maximum temperature of 175°C may be used if the PCB allows it.

B. The power dissipation $P_D$ is based on $T_{J(MAX)}$=175°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. Single pulse width limited by junction temperature $T_{J(MAX)}$=175°C.

D. The $R_{\theta JA}$ is the sum of the thermal impedence from junction to case $R_{\theta JC}$ and case to ambient.

E. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-case thermal impedence which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}$=175°C. The SOA curve provides a single pulse rating.

G. The maximum current rating is package limited.

H. These tests are performed with the device mounted on 1 in $^2$ FR-4 board with 2oz. Copper, in a still air environment with $T_A$=25°C.

## 7.1Typical characteristic

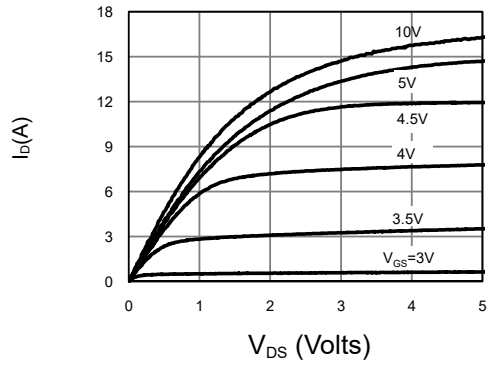



Fig 1: On-Region Characteristics (Note E)

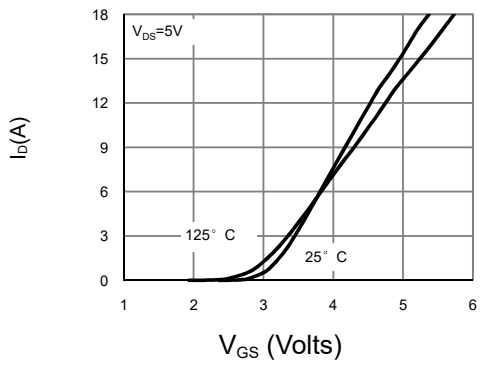



Figure 2: Transfer Characteristics (Note E)

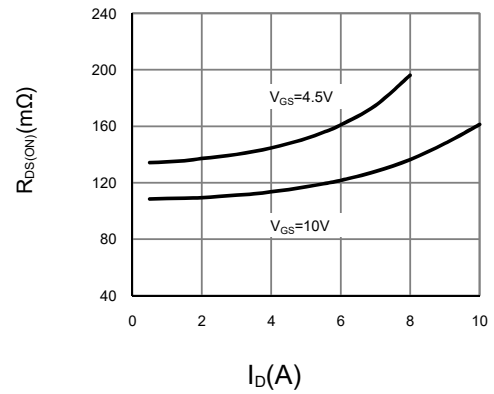



Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

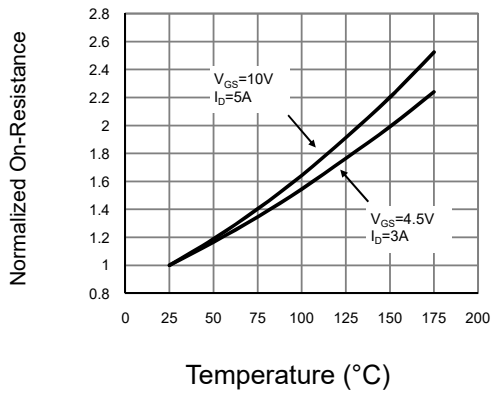



Figure 4: On-Resistance vs. Junction Temperature (Note E)

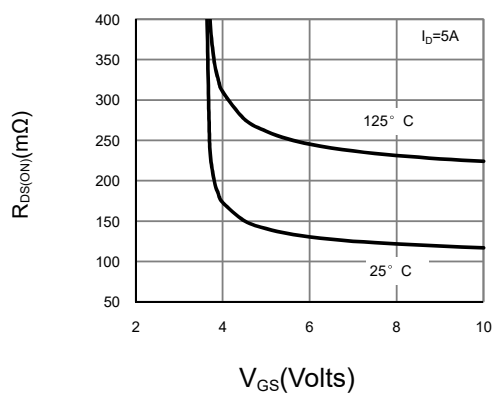



Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

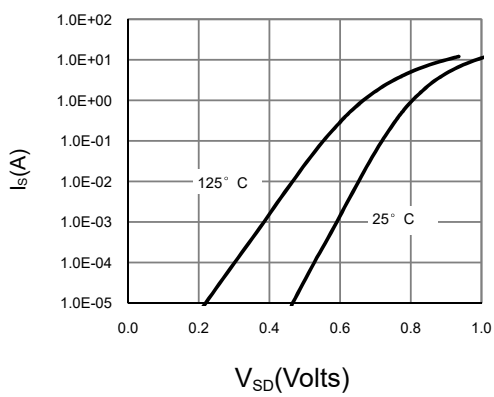



Figure 6: Body-Diode Characteristics(Note E)

## 7.2Typical characteristic

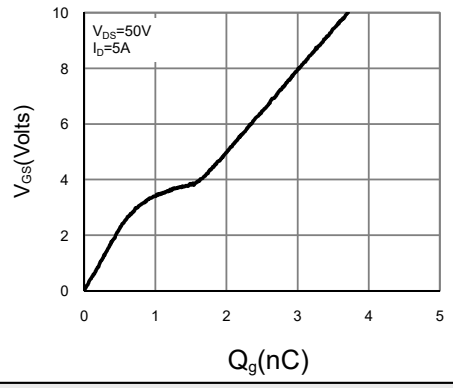



Figure 7: Gate-Charge Characteristics

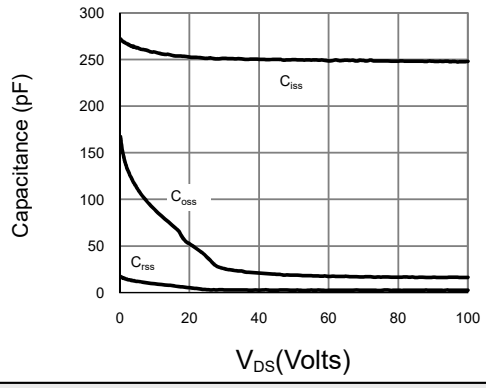



Figure 8: Capacitance Characteristics

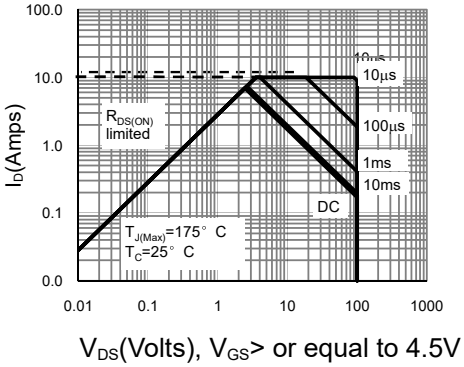



Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

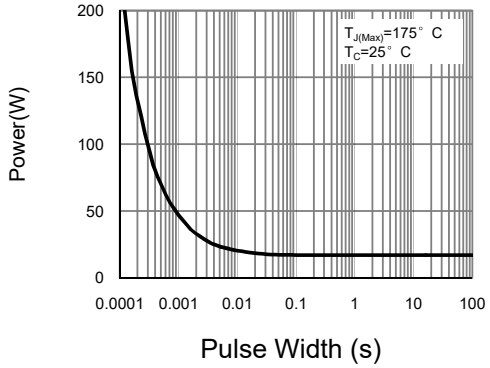



Figure 10: Single Pulse Power Rating Junction-to Case (Note F)

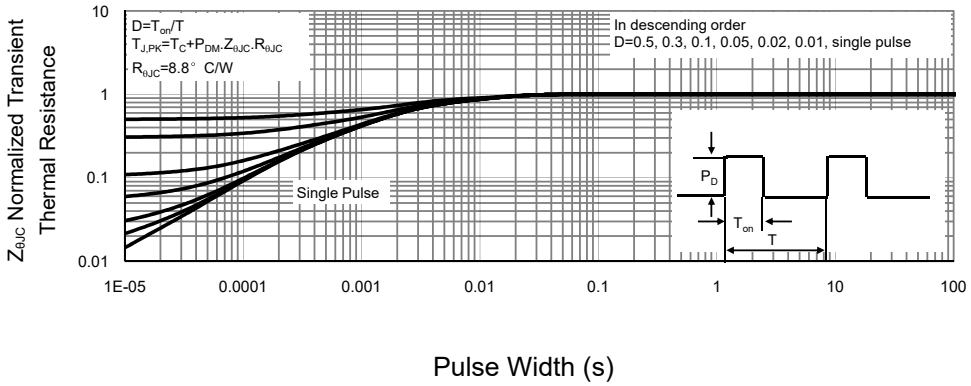



Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)

## 7.3Typical characteristic

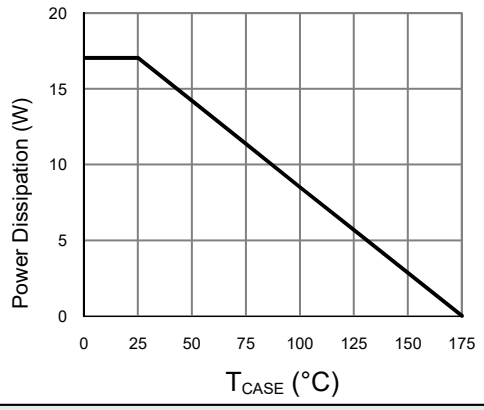



Figure 12: Power De-rating (Note F)

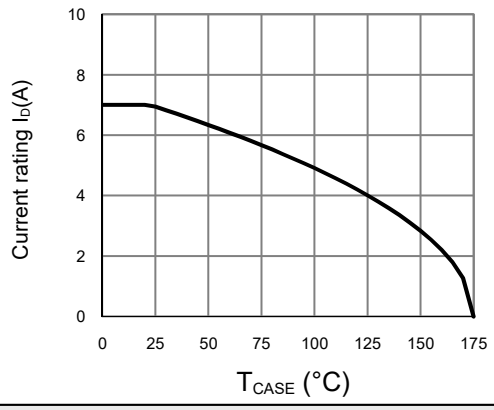



Figure 13: Current De-rating (Note F)

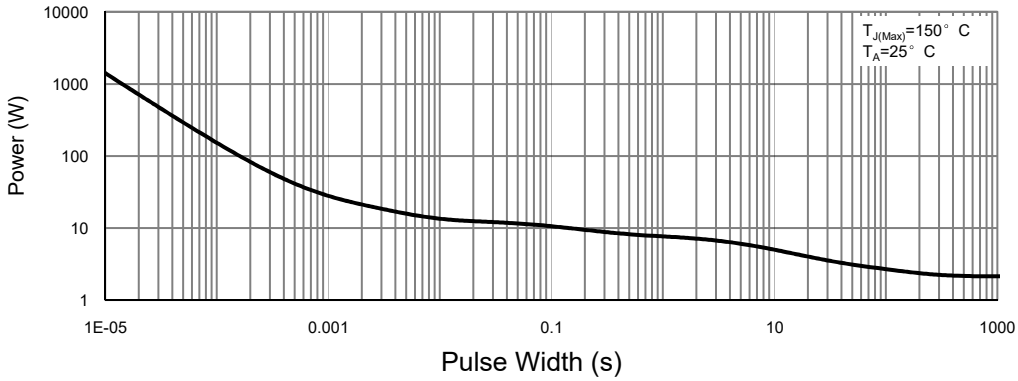



Figure 14: Single Pulse Power Rating Junction-to-Ambient (Note H)

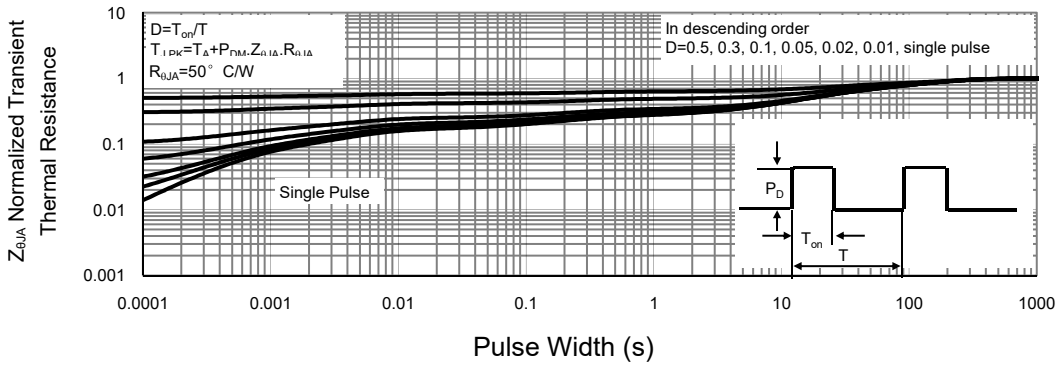
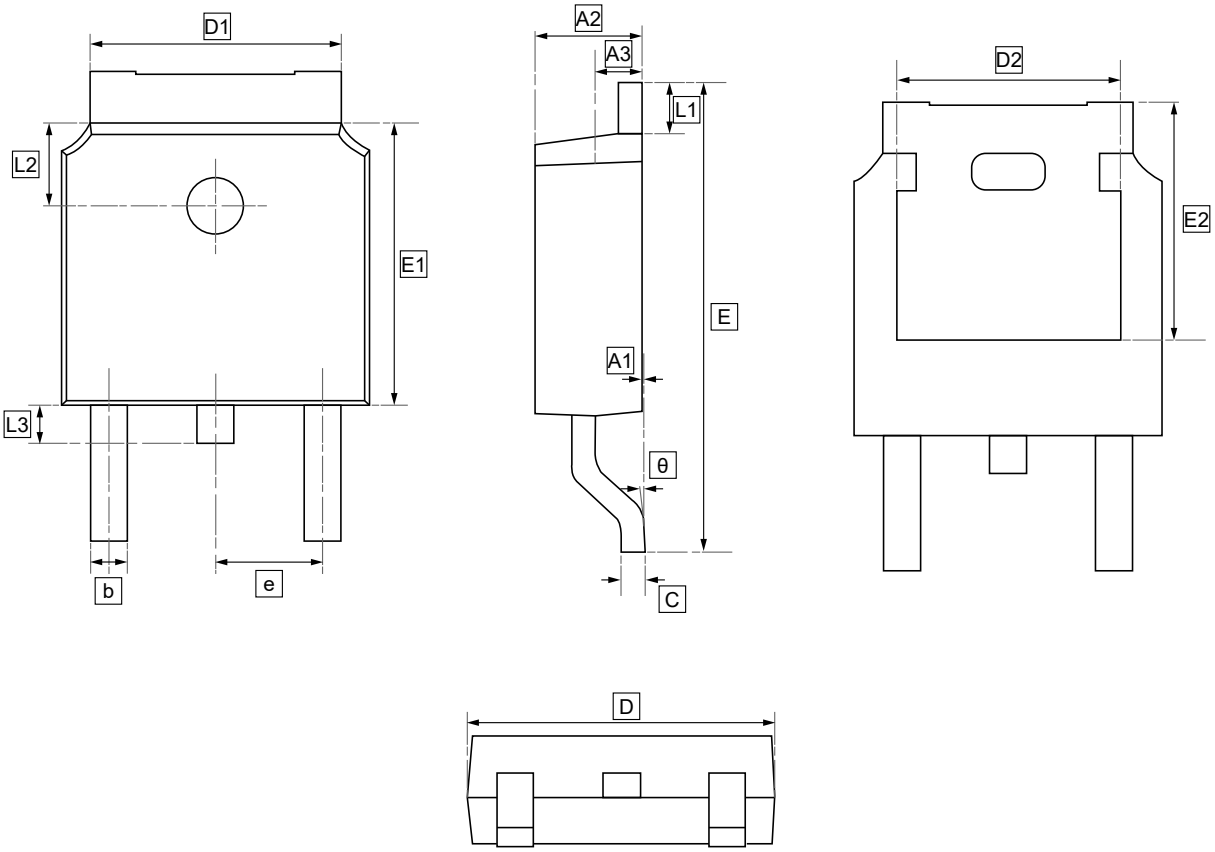



Figure 15: Normalized Maximum Transient Thermal Impedance (Note H)

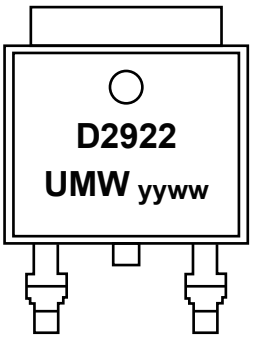
## 8.TO-252 Package Outline Dimensions




**DIMENSIONS (mm are the original dimensions)**

| Symbol | A1 | A2 | A3 | b | c | D | D1 | D2 | E | E1 | E2 | e | L1 | L2 | L3 | θ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Min | 0.00 | 2.18 | 0.90 | 0.65 | 0.46 | 6.35 | 4.95 | 4.32 | 9.40 | 5.97 | 5.21 | 2.286 | 0.89 | 1.70 | 0.60 | 0.00 |
| Max | 0.13 | 2.39 | 1.10 | 0.85 | 0.61 | 6.73 | 5.46 | 4.90 | 10.41 | 6.22 | 5.38 | BSC | 1.27 | 1.90 | 1.00 | 8.00 |

## 9.Ordering information




yy: Year Code
ww: Week Code

| Order Code | Package | Base QTY | Delivery Mode |
|---|---|---|---|
| UMW AOD2922 | TO-252 | 2500 | Tape and reel |

## 10.Disclaimer

UMW reserves the right to make changes to all products, specifications. Customers should obtain the latest version of product documentation and verify the completeness and currency of the information before placing an order.

When applying our products, please do not exceed the maximum rated values, as this may affect the reliability of the entire system. Under certain conditions, any semiconductor product may experience faults or failures. Buyers are responsible for adhering to safety standards and implementing safety measures during system design, prototyping, and manufacturing when using our products to prevent potential failure risks that could lead to personal injury or property damage.

Unless explicitly stated in writing, UMW products are not intended for use in medical, life-saving, or life-sustaining applications, nor for any other applications where product failure could result in personal injury or death. If customers use or sell the product for such applications without explicit authorization, they assume all associated risks.

When reselling, applying, or exporting, please comply with export control laws and regulations of China, the United States, the United Kingdom, the European Union, and other relevant countries, regions, and international organizations.

This document and any actions by UMW do not grant any intellectual property rights, whether express or implied, by estoppel or otherwise. The product names and marks mentioned herein may be trademarks of their respective owners.

ENTEGRECİ

Bu belge www.entegreci.com üzerinden sunulmaktadır.

# Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

### Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

**www.entegreci.com**

### Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

**Kategorilere göz atın**

### Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

**Üreticileri görün**

### Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

**Teklif isteyin**

**www.entegreci.com** | **destek@entegreci.com** | **0850 305 90 34**

Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

Bu sayfa Entegreci tarafından eklenmiştir. Belgenin önceki sayfaları asıl yayıncısına aittir ve içeriği değiştirilmemiştir; en güncel sürüm için belgenin yayıncısına başvurun.