UMW IRF4905

-55V P-Channel MOSFET

1.Description

The TO-220 package is universally preferred for all commercial-industrial applications at power dissipation levels to approximately 50 watts.

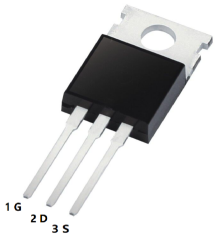
2.Features

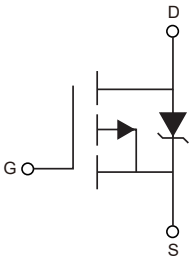
- $V_{DS\ (V)}$=-55V
- I_D=-74A
- $R_{DS(ON)}$<20mΩ(V_{GS}=-10V)

3.Pinning information

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

TO-220





4.Absolute Maximum Ratings

Parameter		Symbol	Rating	Units
Continuous Drain Current, V_{GS}=-10V	T_C=25°C	I_D	-74	A
Continuous Drain Current, V_{GS}=-10V	T_C=100°C		-52	A
Pulsed Drain Current ①		I_{DM}	-260	A
Power Dissipation	T_C=25°C	P_D	200	W
Linear Derating Factor			1.3	W/°C
Gate-to-Source Voltage		V_{GS}	±20	V
Single Pulse Avalanche Energy②		E_{AS}	930	mJ
Avalanche Current①		I_{AR}	-38	A
Repetitive Avalanche Energy①		E_{AR}	20	mJ
Peak Diode Recovery dv/dt ③		dv/dt	-5	V/ns
Storage Temperature Range		T_J, T_{STG}	-55 to 175	°C
Soldering Temperature, for 10 seconds			300 (1.6mm from case)	°C
Mounting torque, 6-32 or M3 screw			10 lbf•in (1.1N•m)	

5.Thermal resistance rating

Parameter	Symbol	Typ	Max	Units
Junction-to-Case	$R_{\theta JC}$		0.75	°C/W
Case-to-Sink, Flat, Greased Surface	$R_{\theta CS}$	0.5		°C/W
Junction-to-Ambient	$R_{\theta JA}$		62	°C/W

6.Electrical Characteristics @ T_J= 25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	I_D=-250μA, V_{GS}=0V	-55			V
Breakdown Voltage Temp. Coefficient	$\Delta V_{(BR)DSS}/T_J$	I_D=-1mA,Reference to 25°C		-0.05		V/°C
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-10V, I_D=-38A ④			20	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-2		-4	V
Forward Transconductance	g_{FS}	V_{DS}=-25V, I_D=-38A	21			S
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=-55V, V_{GS}=0V			-25	μA
		V_{DS}=-44V,V_{GS}=0V,T_J=150°C			-250	μA
Gate-to-Source Forward Leakage	I_{GSS}	V_{GS}=20V			100	nA
Gate-to-Source Reverse Leakage		V_{GS}=-20V			-100	nA
Total Gate Charge	Q_g	I_D=-38A			180	nC
Gate-to-Source Charge	Q_{gs}	V_{DS}=-44V, V_{GS}=-10V			32	nC
Gate-to-Drain ("Miller") Charge	Q_{gd}	See Fig. 6 and 13 ④			86	nC
Turn-On Delay Time	$t_{D(on)}$	V_{DD}=-28V, I_D=-38A R_G=2.5Ω, R_D=0.72Ω See Fig. 10 ④		18		ns
Rise Time	t_r			99		ns
Turn-Off Delay Time	$t_{D(off)}$			61		ns
Fall Time	t_f			96		ns
Internal Drain inductance	L_D	Between lead, 6mm (0.25in.) from package and center of die contact		4.5		nH
Internal Source inductance	L_S			7.5		nH
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-25V f=1.0MHz, See Fig. 5		3400		pF
Output Capacitance	C_{oss}			1400		pF
Reverse Transfer Capacitance	C_{rss}			640		pF

Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	MOSFET symbol showing the integral reverse p-n junction diode.			-74	A
Pulsed Source Current (Body Diode) ①	I_{SM}				-260	
Diode Forward Voltage	V_{SD}	T_J=25°C, I_S=-38A, V_{GS}=0V ④			-1.6	V
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=-38A dI/dt=-100A/μs ④		89	130	ns
Reverse Recovery Charge	Q_{rr}			230	350	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by L_S+L_D)				

Notes:

① Repetitive rating; pulse width limited by max. junction temperature.

② Starting T_J= 25°C,L=1.3mH, R_G=25Ω,I_{AS}=-38A.

③ I_{SD} ≤-38A, di/dt ≤ -270A/μs, V_{DD} ≤ $V_{(BR)DSS}$,T_J ≤ 175°C.

④ Pulse width ≤ 300μs; duty cycle ≤ 2%.

7.1 Typical Characterisitics

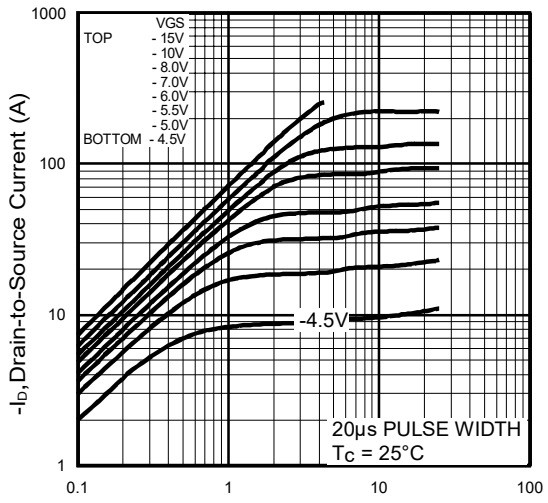


Figure 1: Typical Output Characteristics

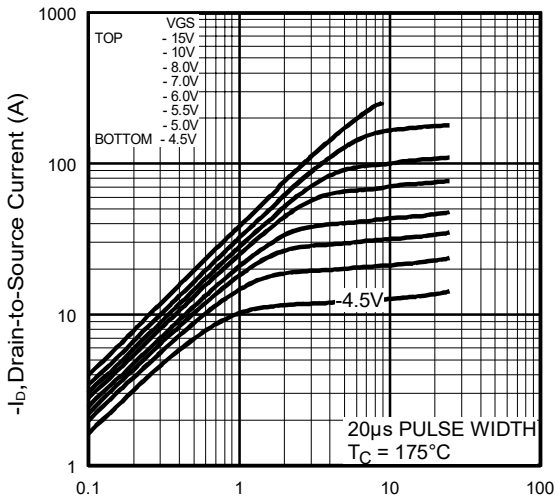


Figure 2: Typical Output Characteristics

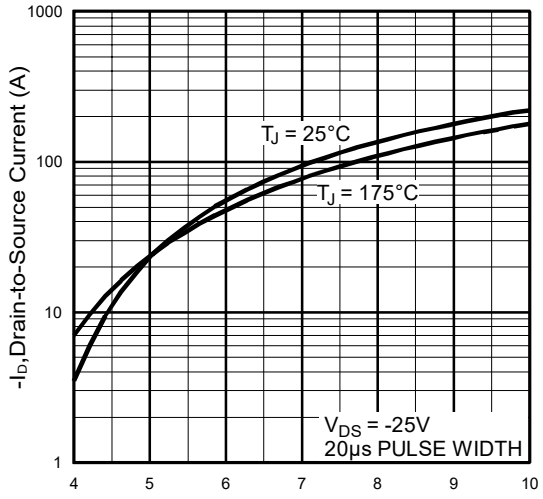


Figure 3: Typical Transfer Characteristics

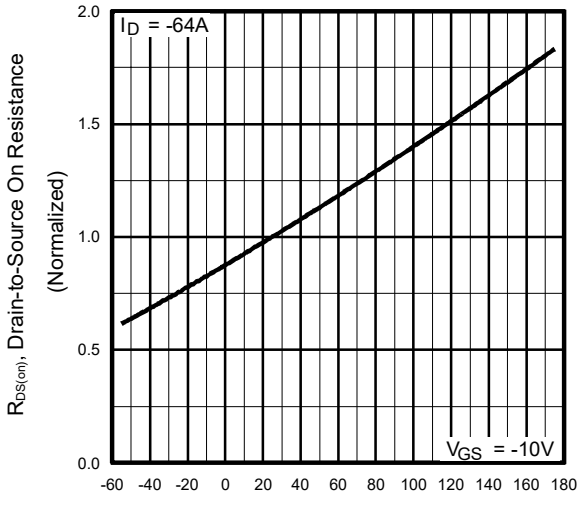
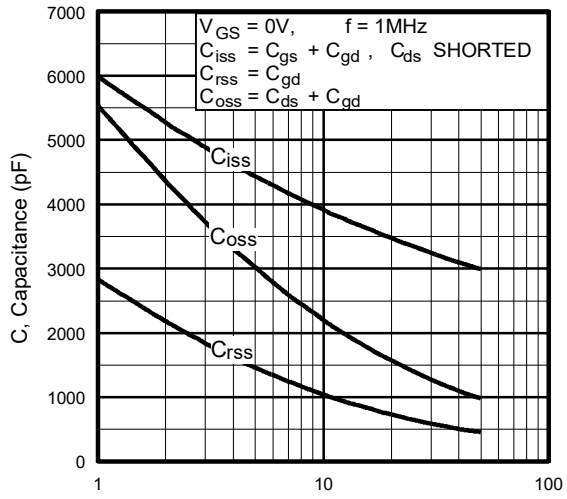


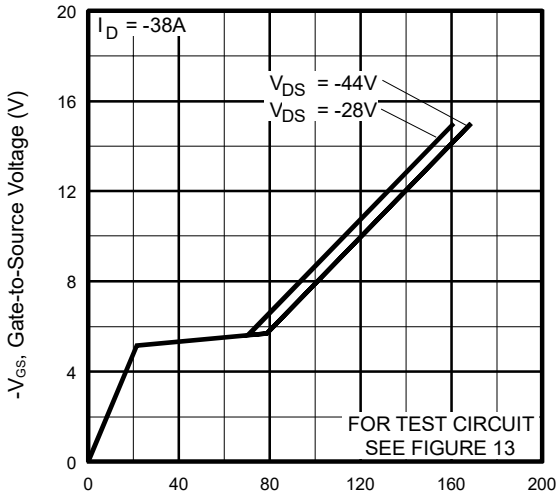
Figure 4: Nomalized On-ResistanceVs. Temperature

7.2 Typical Characterisitics



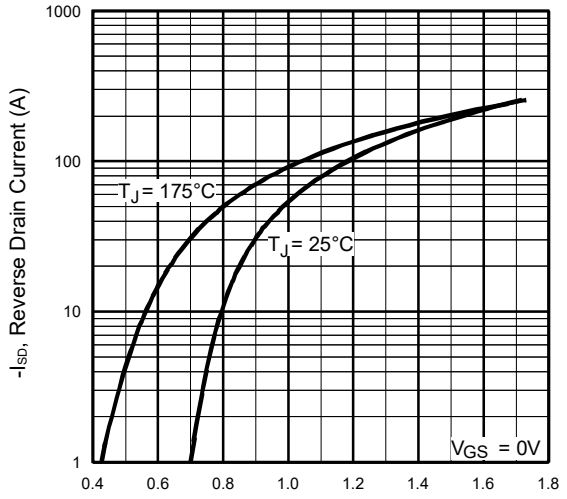
$-V_{DS}$,Drain-to-Source Voltage (V)

Figure 5: Typical Capacitance Vs. Drain-to-Source Voltage



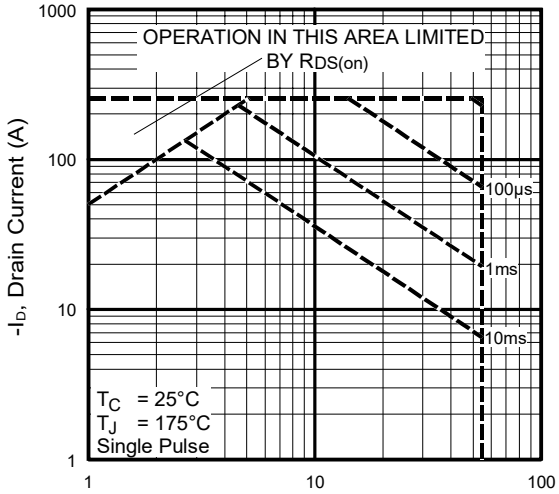
Q_G, Total Gate Charge (nC)

Figure 6: Typical Gate Charge Vs. Gate-to-Source Voltage



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

Figure 7: Typical Source-Drain Diode Forward Voltage



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

Figure 8: Maximum Safe Operating Area

7.3 Typical Characterisitics

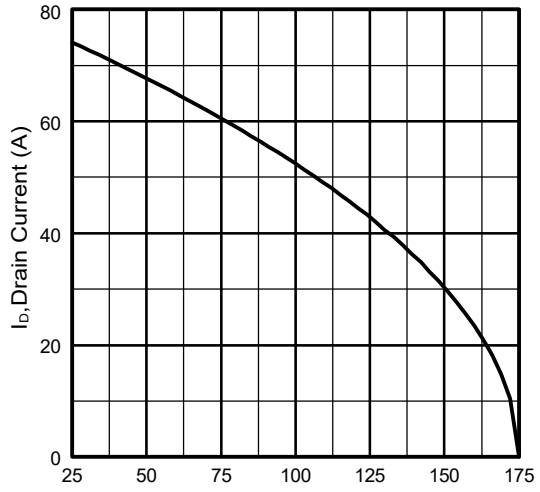


Figure 9: Maximum Drain Current Vs. Case Temperature

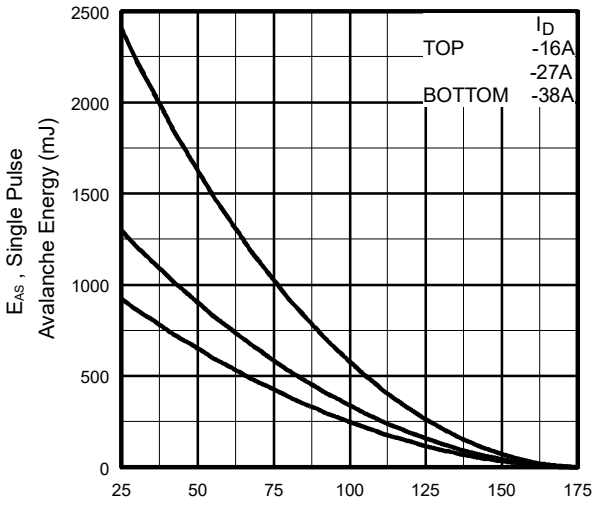


Figure 10: Maximum Avalanche Energy Vs. Drain Current

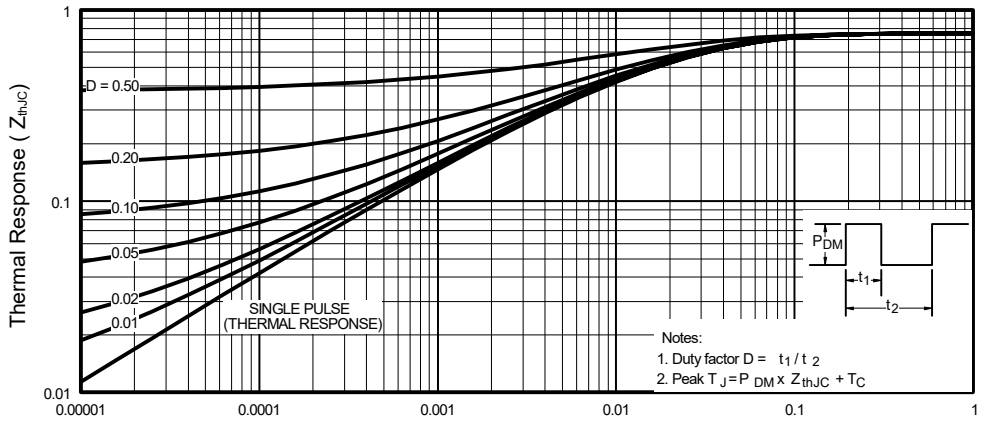


Figure 11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

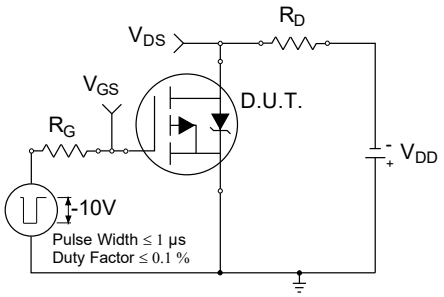


Figure 12a: Switching Time Test Circuit

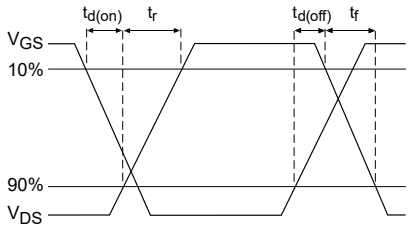


Figure 12b: Switching Time Waveforms

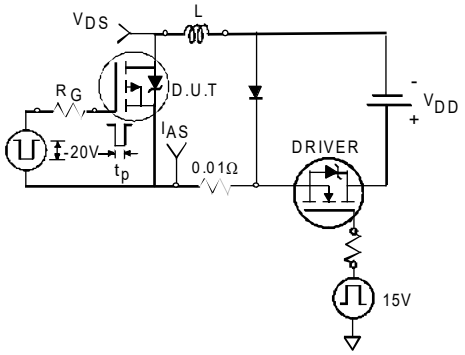


Figure 13a: Unclamped Inductive Test Circuit

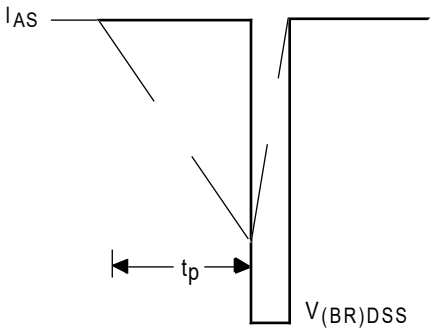


Figure 13b: Unclamped Inductive Waveforms

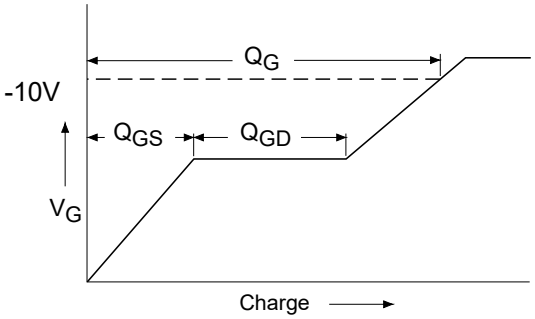


Figure 14a: Basic Gate Charge Waveform

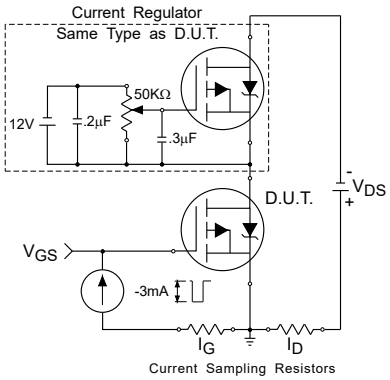
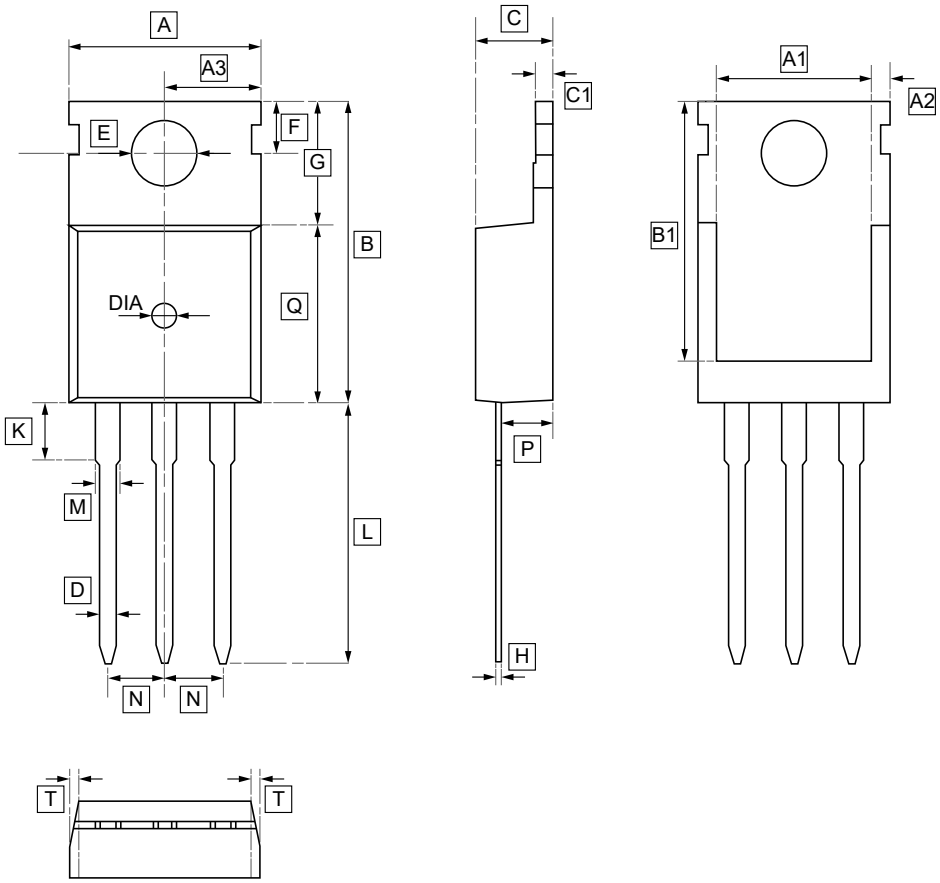


Figure 14b: Gate Charge Test Circuit

8.TO-220 Package Outline Dimensions

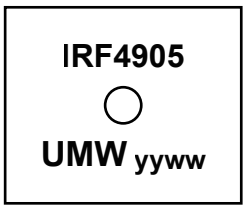


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	B	B1	C	C1	D	E	F	G
Min	9.7	8.44	1.05	4.8	15.4	12.9	4.28	1.1	0.6	3.4	2.65	5.2
Max	10.3	8.84	1.25	5.2	16.2	13.5	4.68	1.5	1.0	3.8	3.25	5.8

Symbol	H	K	L	L1	M	N	P	Q	T	DIA
Min	0.4	2.9	12.8	2.7	1.15	2.49	2.1	8.7	W:0.35	⊙1.5 (deep 0.2)
Max	0.6	3.3	13.6	3.3	1.35	2.59	2.7	9.3		

9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW IRF4905	TO-220	1000	Tube and box

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.