N-CHANNEL ENHANCEMENT MODE FIELD-EFFECT TRANSISTOR

Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D Max T_A = +25°C
60V	2Ω @ V_{GS} = 10V	0.3A
	3Ω @ V_{GS} = 5V	0.2A

Features and Benefits

- Low On-Resistance: $R_{DS(ON)}$
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- ESD Protected Up to 2kV
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. https://www.diodes.com/quality/product-definitions/**
- **An automotive-compliant part is available under separate datasheet (DMN601TKQ)**

Description and Applications

This MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$) yet maintain superior switching performance, making it ideal for high-efficiency power-management applications.

- Motor controls
- Power-management functions

Mechanical Data

- Package: SOT523
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Ansnealed over Alloy 42 Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Terminal Connections: See Diagram
- Weight: 0.002 grams (Approximate)

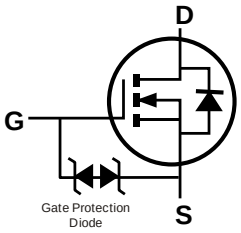
SOT523



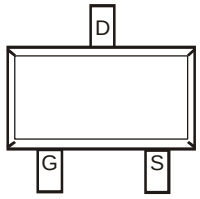
ESD Protected up to 2kV



Top View



Equivalent Circuit



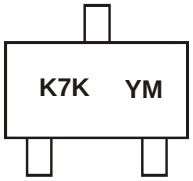
Top View
Pin Out Configuration

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMN601TK-7	SOT523	3000	Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
2. See https://www.diodes.com/quality/lead-free/ for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



K7K = Product Type Marking Code
YM = Date Code Marking
Y or $\overline{Y}$ = Year (ex: L = 2024)
M = Month (ex: 4 = April)

Date Code Key

Year	2005	-	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Code	S	-	L	M	N	P	R	S	T	U	V	W

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

© 2024 Copyright Diodes Incorporated. All Rights Reserved.

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current (Note 5)	Continuous Pulsed (Note 6)	I_D	300 800	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P_D	150	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	833	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	V_{GS} = 0, I_D = 10μA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1.0	μA	V_{DS} = 60V, V_{GS} = 0
Gate-Source Leakage	I_{GSS}	—	—	±10	μA	V_{GS} = ±20V, V_{DS} = 0
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(TH)}$	1.0	1.6	2.5	V	V_{DS} = 10V, I_D = 1mA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	1.3 1.4	2.0 3.0	Ω	V_{GS} = 10V, I_D = 0.5A V_{GS} = 5V, I_D = 0.05A
Forward Transfer Admittance	$\|Y_{FS}\|$	80	—	—	ms	V_{DS} = 10V, I_D = 0.2A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	—	50	pF	V_{DS} = 25V, V_{GS} = 0, f = 1.0MHz
Output Capacitance	C_{oss}	—	—	25	pF	
Reverse Transfer Capacitance	C_{rss}	—	—	5.0	pF	
Turn-On Delay Time	$t_{D(ON)}$	—	3.4	—	ns	V_{DD} = 25V, V_{GS} = 10V, R_G = 25Ω, I_D = 500mA
Turn-On Rise Time	t_R	—	2.4	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	11.0	—	ns	
Turn-Off Fall Time	t_F	—	4.9	—	ns	

Notes: 5. Device mounted on FR-4 PCB.
6. Pulse width ≤ 10μs, Duty Cycle ≤ 1%.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to product testing.

© 2024 Copyright Diodes Incorporated. All Rights Reserved.

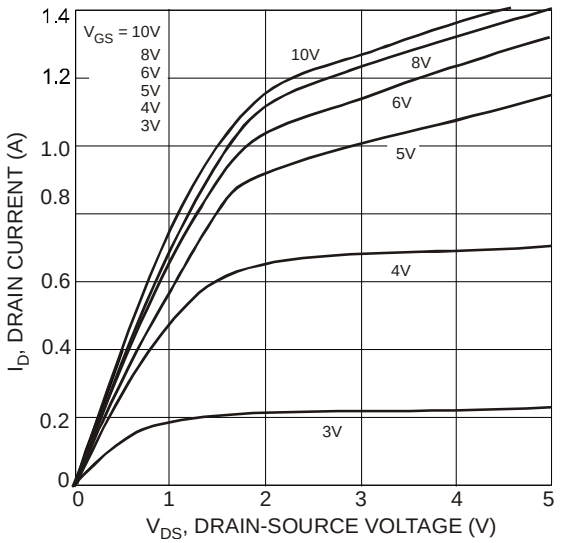


Figure 1. Typical Output Characteristics

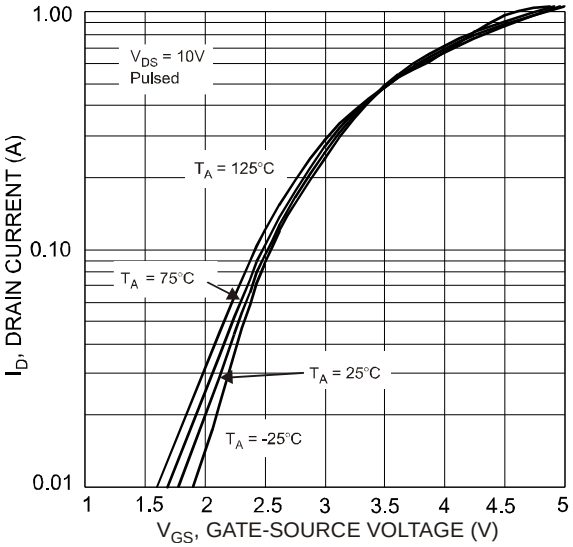


Figure 2. Typical Transfer Characteristics

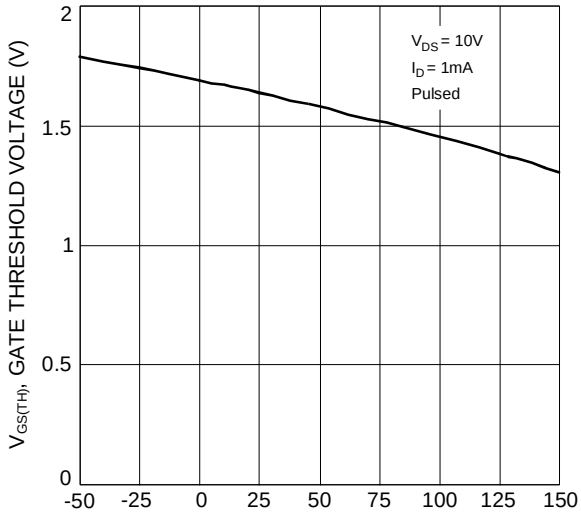


Figure 3. Gate Threshold Voltage vs. Channel Temperature

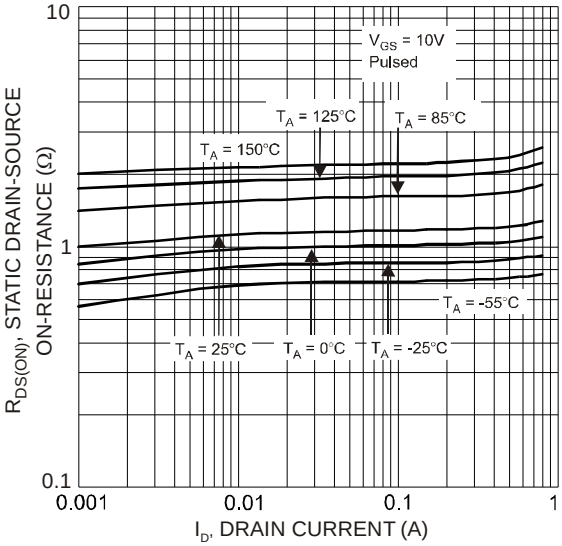


Figure 4. Static Drain-Source On-Resistance vs. Drain Current

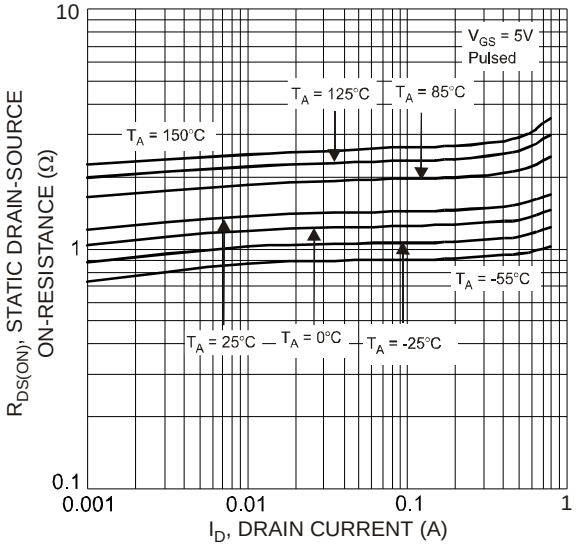


Figure 5. Static Drain-Source On-Resistance vs. Drain Current

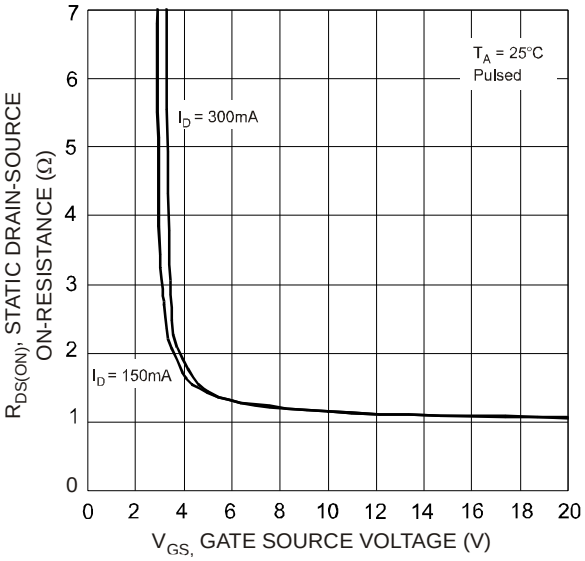


Figure 6. Static Drain-Source On-Resistance vs. Gate-Source Voltage

© 2024 Copyright Diodes Incorporated. All Rights Reserved.

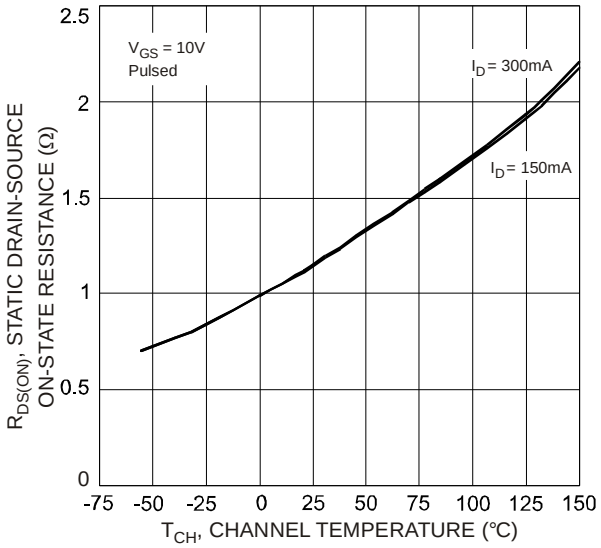


Figure 7. Static Drain-Source On-State Resistance vs. Channel Temperature

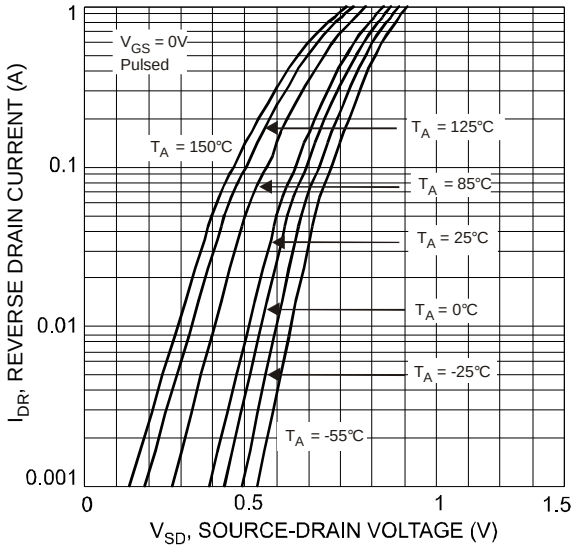


Figure 8. Reverse Drain Current vs. Source-Drain Voltage

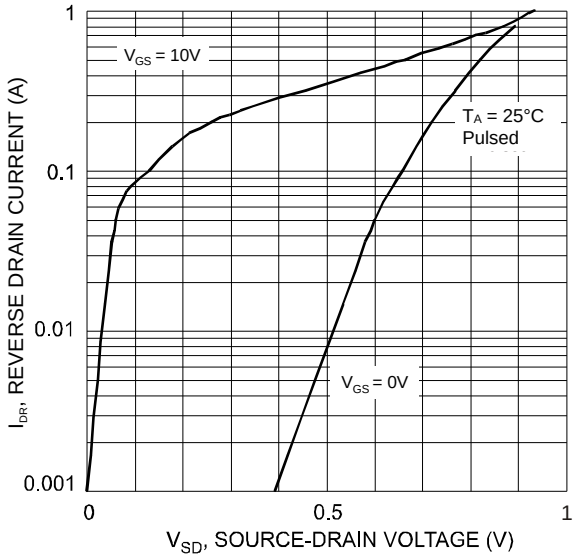


Figure 9. Reverse Drain Current vs. Source-Drain Voltage

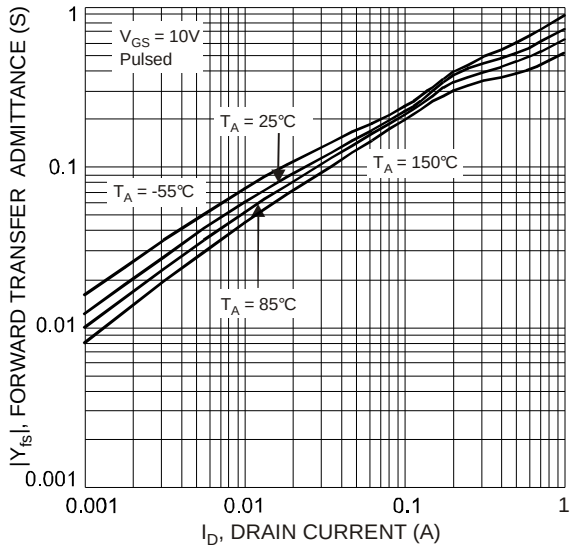


Figure 10. Forward Transfer Admittance vs. Drain Current

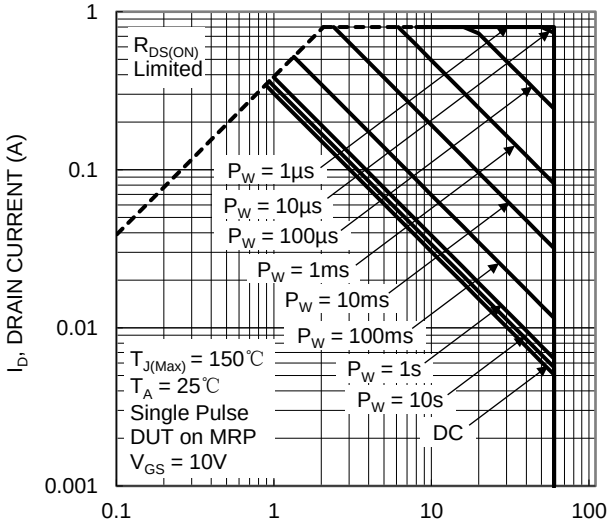


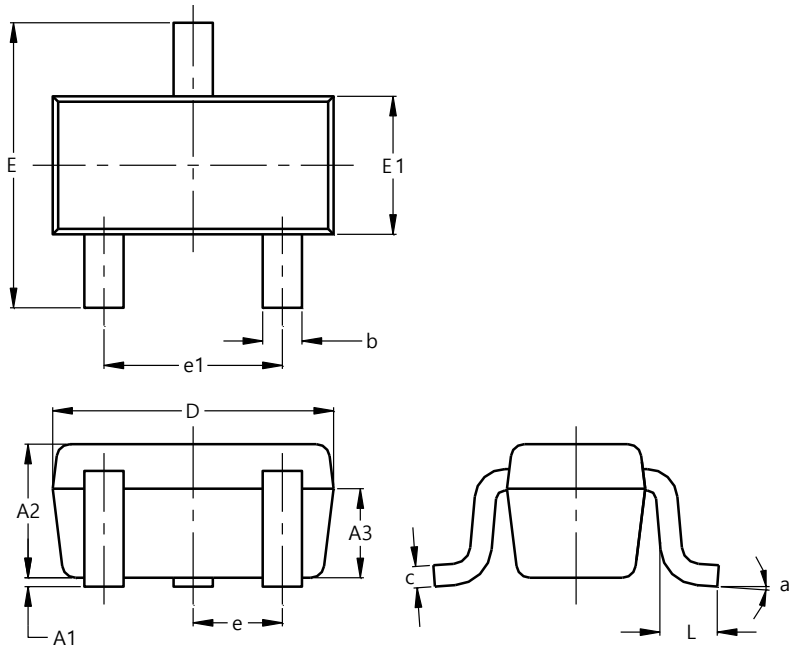
Figure 11. SOA, Safe Operation Area

© 2024 Copyright Diodes Incorporated. All Rights Reserved.

Package Outline Dimensions

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT523

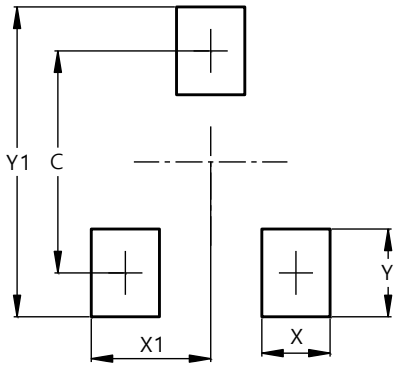


SOT523			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.60	0.80	0.75
A3	0.45	0.65	0.50
b	0.15	0.30	0.22
c	0.10	0.20	0.12
D	1.50	1.70	1.60
E	1.45	1.75	1.60
E1	0.75	0.85	0.80
e	0.50 BSC		
e1	0.90	1.10	1.00
L	0.20	0.40	0.33
a	0°	--	8°
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.

SOT523



Dimensions	Value (in mm)
C	1.29
X	0.40
X1	0.70
Y	0.51
Y1	1.80

© 2024 Copyright Diodes Incorporated. All Rights Reserved.

IMPORTANT NOTICE

1. DIODES INCORPORATED (Diodes) AND ITS SUBSIDIARIES MAKE NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO ANY INFORMATION CONTAINED IN THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT OF THIRD PARTY INTELLECTUAL PROPERTY RIGHTS (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

2. The Information contained herein is for informational purpose only and is provided only to illustrate the operation of Diodes' products described herein and application examples. Diodes does not assume any liability arising out of the application or use of this document or any product described herein. This document is intended for skilled and technically trained engineering customers and users who design with Diodes' products. Diodes' products may be used to facilitate safety-related applications; however, in all instances customers and users are responsible for (a) selecting the appropriate Diodes products for their applications, (b) evaluating the suitability of Diodes' products for their intended applications, (c) ensuring their applications, which incorporate Diodes' products, comply the applicable legal and regulatory requirements as well as safety and functional-safety related standards, and (d) ensuring they design with appropriate safeguards (including testing, validation, quality control techniques, redundancy, malfunction prevention, and appropriate treatment for aging degradation) to minimize the risks associated with their applications.

3. Diodes assumes no liability for any application-related information, support, assistance or feedback that may be provided by Diodes from time to time. Any customer or user of this document or products described herein will assume all risks and liabilities associated with such use, and will hold Diodes and all companies whose products are represented herein or on Diodes' websites, harmless against all damages and liabilities.

4. Products described herein may be covered by one or more United States, international or foreign patents and pending patent applications. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks and trademark applications. Diodes does not convey any license under any of its intellectual property rights or the rights of any third parties (including third parties whose products and services may be described in this document or on Diodes' website) under this document.

5. Diodes' products are provided subject to Diodes' Standard Terms and Conditions of Sale (https://www.diodes.com/about/company/terms-and-conditions/terms-and-conditions-of-sales/) or other applicable terms. This document does not alter or expand the applicable warranties provided by Diodes. Diodes does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel.

6. Diodes' products and technology may not be used for or incorporated into any products or systems whose manufacture, use or sale is prohibited under any applicable laws and regulations. Should customers or users use Diodes' products in contravention of any applicable laws or regulations, or for any unintended or unauthorized application, customers and users will (a) be solely responsible for any damages, losses or penalties arising in connection therewith or as a result thereof, and (b) indemnify and hold Diodes and its representatives and agents harmless against any and all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim relating to any noncompliance with the applicable laws and regulations, as well as any unintended or unauthorized application.

7. While efforts have been made to ensure the information contained in this document is accurate, complete and current, it may contain technical inaccuracies, omissions and typographical errors. Diodes does not warrant that information contained in this document is error-free and Diodes is under no obligation to update or otherwise correct this information. Notwithstanding the foregoing, Diodes reserves the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes.

8. Any unauthorized copying, modification, distribution, transmission, display or other use of this document (or any portion hereof) is prohibited. Diodes assumes no responsibility for any losses incurred by the customers or users or any third parties arising from any such unauthorized use.

9. This Notice may be periodically updated with the most recent version available at https://www.diodes.com/about/company/terms-and-conditions/important-notice

The Diodes logo is a registered trademark of Diodes Incorporated in the United States and other countries.
All other trademarks are the property of their respective owners.
© 2024 Diodes Incorporated. All Rights Reserved.

www.diodes.com

© 2024 Copyright Diodes Incorporated. All Rights Reserved.

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.