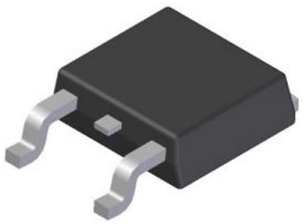
ZXMN10A25K Datasheet



DiGi Electronics Part Number	ZXMN10A25K-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	ZXMN10A25K
Description	MOSFET N-CH 100V 4.2A TO252-3
Detailed Description	N-Channel 100 V 4.2A (Ta) 2.11W (Ta) Surface Mount TO-252-3

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
ZXMN10A25K	Diodes Incorporated
Series:	Product Status:
-	Obsolete
FET Type:	Technology:
N-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
100 V	4.2A (Ta)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
6V, 10V	125mOhm @ 2.9A, 10V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
4V @ 250µA	17.16 nC @ 10 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±20V	859 pF @ 50 V
FET Feature:	Power Dissipation (Max):
-	2.11W (Ta)
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Supplier Device Package:	Package / Case:
TO-252-3	TO-252-3, DPAK (2 Leads + Tab), SC-63

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.29.0095	

A Product Line of
Diodes Incorporated

Green

ZXMN10A25K

100V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	Package	Max I_D T_A = +25°C
100V	125mΩ @ V_{GS}= 10V	TO252 (DPAK)	6.4A
	150mΩ @ V_{GS}= 6V		5.8A

Features

- Low On-Resistance
- Fast Switching Speed
- Low Gate Drive
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Description

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

Mechanical Data

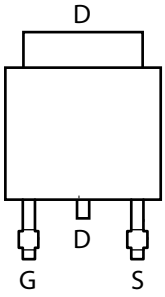
- Case: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0 (Note 1)
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.33 grams (approximate)

Applications

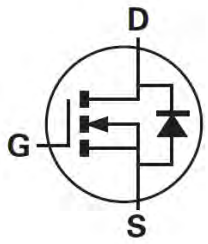
- DC-DC Converters
- Power Management Functions
- Disconnect Switches
- Motor Control

TO252

Top View



Pin Out -Top View



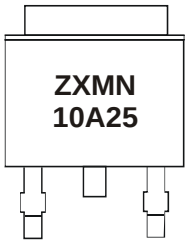
Equivalent Circuit

Ordering Information (4 & 5)

Part Number	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMN10A25KTC	ZXMN10A25	13	16	2,500

Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
2. See http://www.diodes.com 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 http://www.diodes.com.
5. Products with Q-suffix are automotive grade. Automotive products are electrical and thermal the same as the commercial, except where specified.

Marking Information



ZXMN10A25 = Product Type Marking Code

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

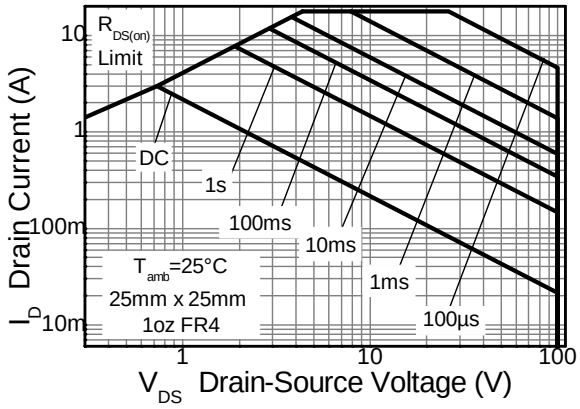
Characteristic			Symbol	Value	Unit
Drain-Source voltage			V_{DSS}	100	V
Gate-Source voltage			V_{GS}	±20	V
Continuous Drain current	V_{GS} = 10V	(Note 7)	I_D	6.4	A
		T_A = +70°C (Note 7)		5	
		(Note 6)		4.2	
Pulsed Drain current		(Note 8)	I_{DM}	21	A
Continuous Source current (Body diode)		(Note 7)	I_S	10	A
Pulsed Source current (Body diode)		(Note 8)	I_{SM}	21	A

Thermal Characteristics

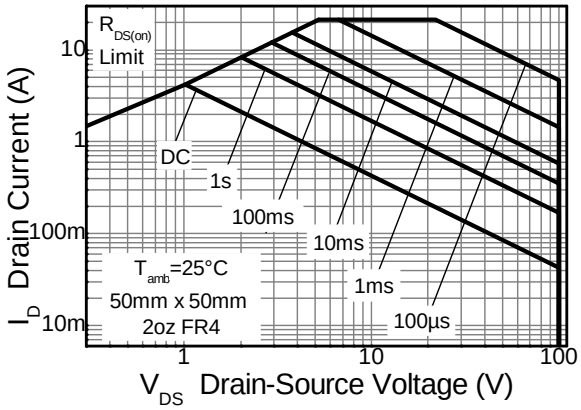
Characteristic		Symbol	Value	Unit
Power dissipation Linear derating factor	(Note 6)	P_D	4.25 34	W mW/°C
	(Note 7)		9.85 78.7	
	(Note 9)		2.11 16.8	
Thermal Resistance, Junction to Ambient	(Note 6)	$R_{\theta JA}$	29.4	°C/W
	(Note 7)		12.7	
	(Note 9)		59.1	
Thermal Resistance, Junction to Lead	(Note 10)	$R_{\theta JL}$	1.43	
Operating and storage temperature range		T_J, T_{STG}	-55 to 150	°C

Notes:
6. For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
7. For a device surface mounted on FR4 PCB measured at t ≤ 10 sec.
8. Repetitive rating 50mm x 50mm x 1.6mm FR4 PCB, D = 0.02 and pulse width 300µs. The pulse current is limited by the maximum junction temperature.
9. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
10. Thermal resistance from junction to solder-point (at the end of the drain lead).

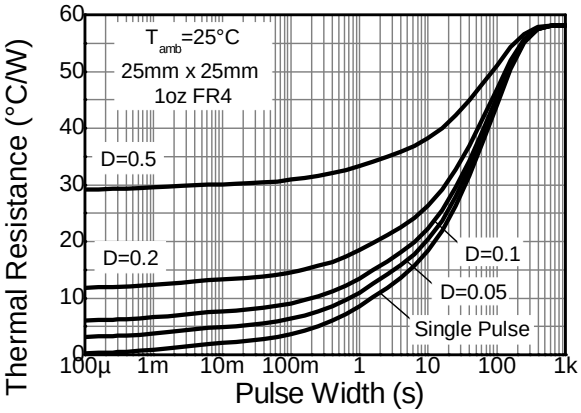
Thermal Characteristics



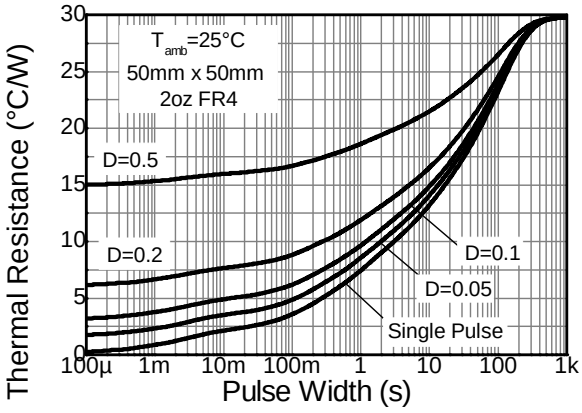
Safe Operating Area



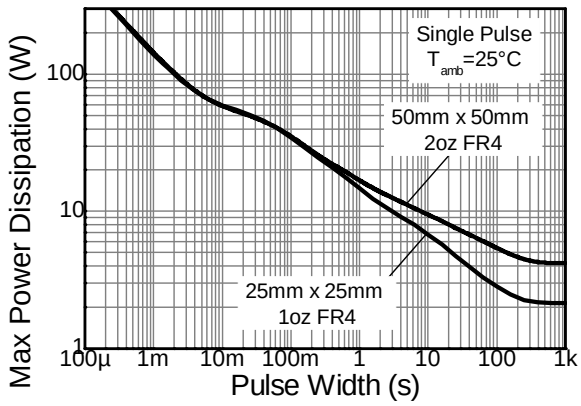
Safe Operating Area



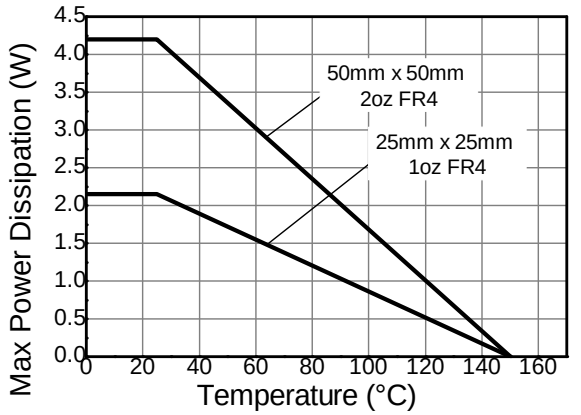
Transient Thermal Impedance



Transient Thermal Impedance



Pulse Power Dissipation



Derating Curve

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

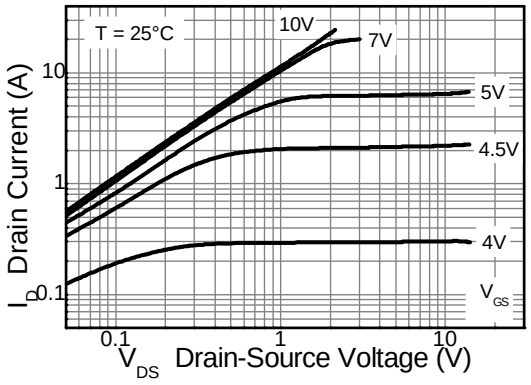
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	100	—	—	V	I_D = 250µA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	0.5	µA	V_{DS} = 100V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	2.0	—	4.0	V	I_D = 250µA, V_{DS} = V_{GS}
Static Drain-Source On-Resistance (Note 11)	$R_{DS\ (ON)}$	—	—	125	mΩ	V_{GS} = 10V, I_D = 3.2A
				150		V_{GS} = 6V, I_D = 2.6A
Forward Transconductance (Notes 11 & 12)	g_{fs}	—	7.3	—	S	V_{DS} = 15V, I_D = 2.9A
Diode Forward Voltage (Note 11)	V_{SD}	—	0.85	0.95	V	I_S = 3.2A, V_{GS} = 0V, T_J = +25°C
Reverse recovery time (Note 12)	t_{rr}		40.5	—	ns	I_S = 2.9A, di/dt = 100A/µs
Reverse recovery charge (Note 12)	Q_{rr}	—	62	—	nC	T_J = +25°C
DYNAMIC CHARACTERISTICS (Note 12)						
Input Capacitance	C_{iss}	—	859	—	pF	V_{DS} = 50V, V_{GS} = 0V f = 1MHz
Output Capacitance	C_{oss}	—	57.3	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	33	—	pF	
Total Gate Charge (Note 13)	Q_g	—	9.6	—	nC	V_{GS} = 5V
Total Gate Charge (Note 13)	Q_g	—	17.16	—	nC	V_{GS} = 10V
Gate-Source Charge (Note 13)	Q_{gs}	—	3.77	—	nC	V_{DS} = 50V I_D = 2.9A
Gate-Drain Charge (Note 13)	Q_{gd}	—	5.36	—	nC	
Turn-On Delay Time (Note 13)	$t_{D(on)}$	—	4.9	—	ns	V_{DD} = 50V, V_{GS} = 10V I_D = 1A, $R_G \cong 6.0\Omega$
Turn-On Rise Time (Note 13)	t_r	—	3.7	—	ns	
Turn-Off Delay Time (Note 13)	$t_{D(off)}$	—	17.7	—	ns	
Turn-Off Fall Time (Note 13)	t_f	—	9.4	—	ns	

Notes: 11. Measured under pulsed conditions. Pulse width ≤ 300µs; duty cycle ≤ 2%
12. For design aid only, not subject to production testing.
13. Switching characteristics are independent of operating junction temperatures.

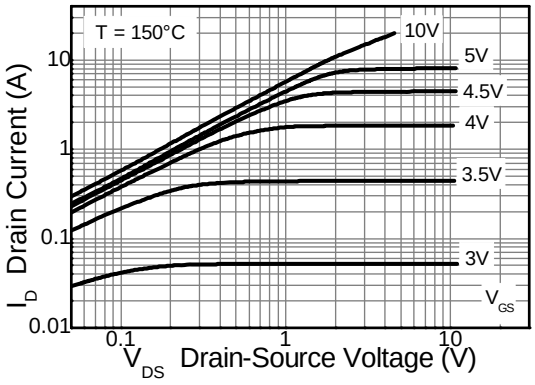
A Product Line of
Diodes Incorporated

ZXMN10A25K

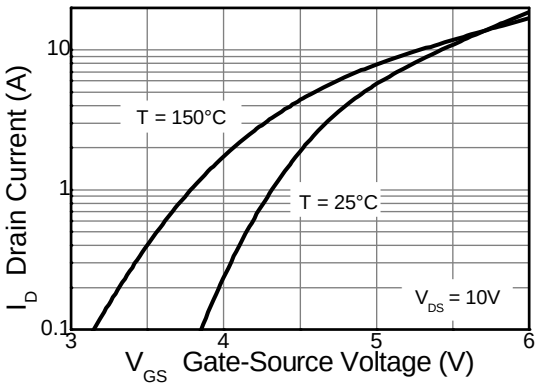
Typical Characteristics



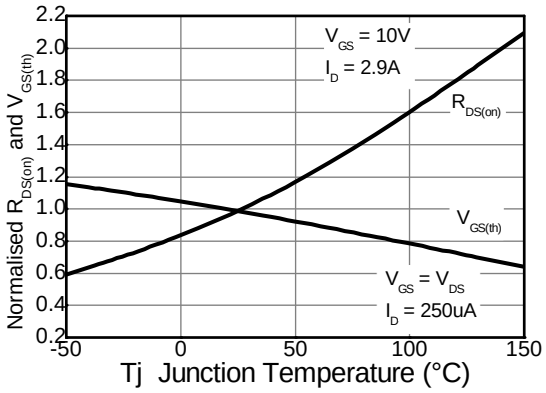
Output Characteristics



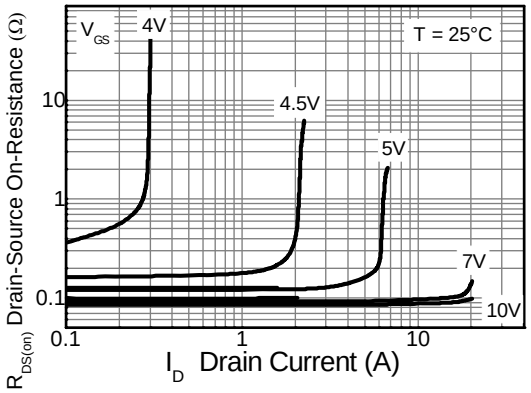
Output Characteristics



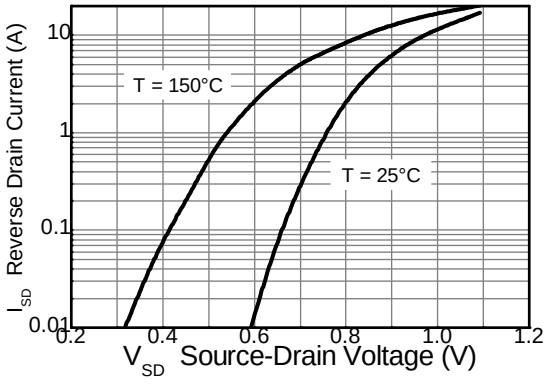
Typical Transfer Characteristics



Normalised Curves v Temperature



On-Resistance v Drain Current

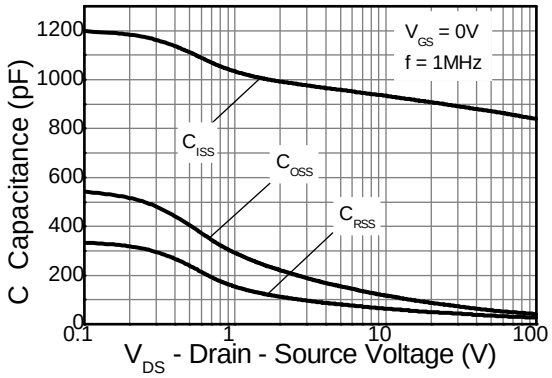


Source-Drain Diode Forward Voltage

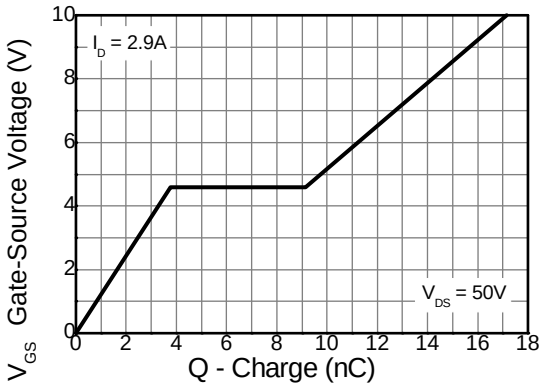
A Product Line of
Diodes Incorporated

ZXMN10A25K

Typical Characteristics (cont.)

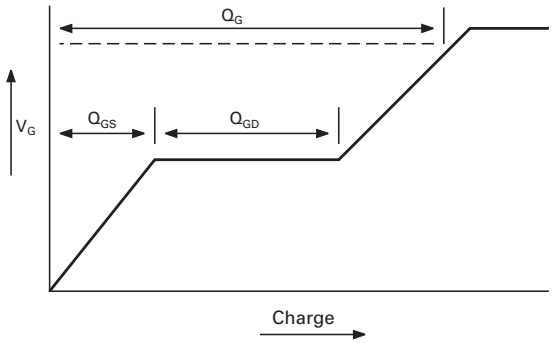


Capacitance v Drain-Source Voltage

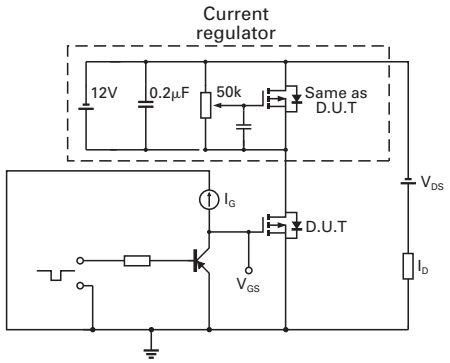


Gate-Source Voltage v Gate Charge

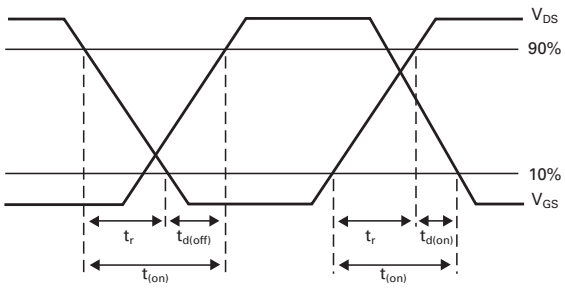
Test Circuits



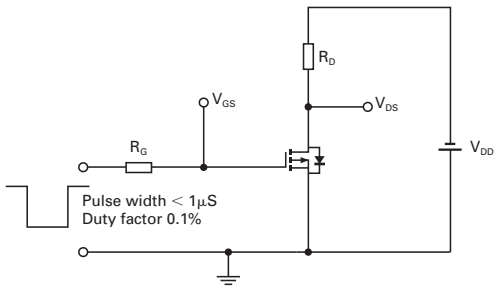
Basic gate charge waveform



Gate charge test circuit



Switching time waveforms

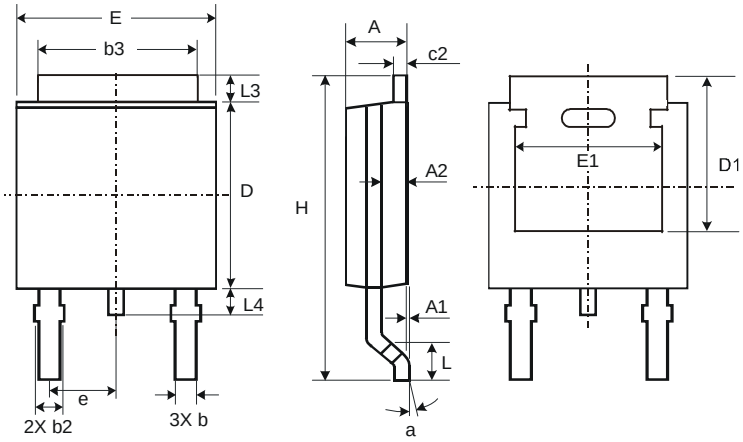


Switching time test circuit

A Product Line of
Diodes Incorporated

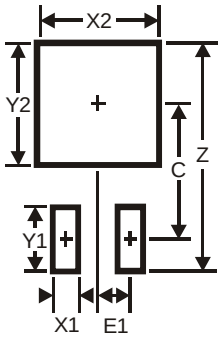
ZXMN10A25K

Package Outline Dimensions



TO252			
Dim	**Min**	**Max**	**Typ**
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c2	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	–	–
e	–	–	2.286
E	6.45	6.70	6.58
E1	4.32	–	–
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	–
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	11.6
X1	1.5
X2	7.0
Y1	2.5
Y2	7.0
C	6.9
E1	2.3

A Product Line of
Diodes Incorporated

ZXMN10A25K

IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or
2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

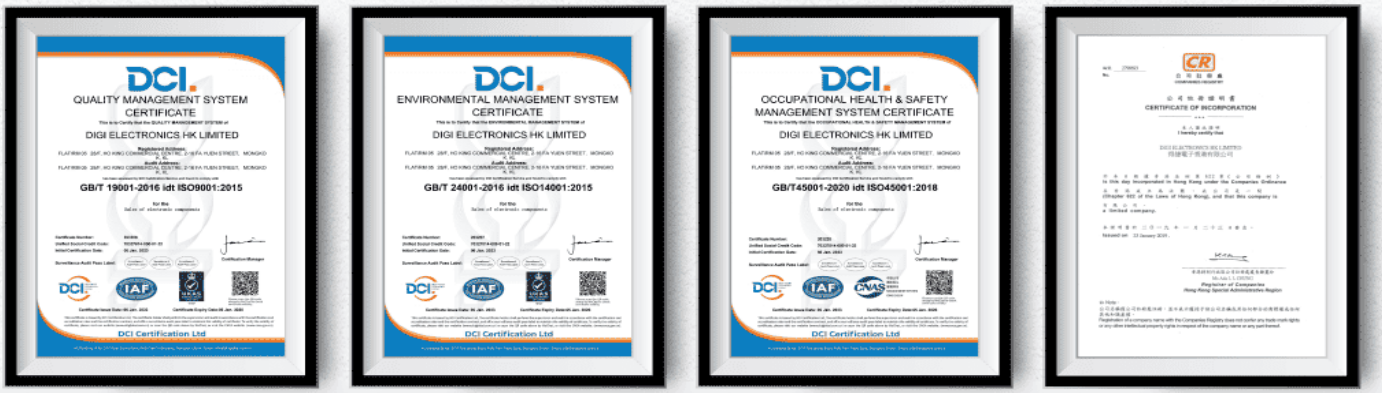
B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

www.diodes.com

OUR CERTIFICATE

DiGi provide top-quality products and perfect service for customer worldwide through standardization, technological innovation and continuous improvement. DiGi through third-party certification, we striciy control the quality of products and services. Welcome your RFQ to Email: Info@DiGi-Electronics.com



Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.