DMN65D8LQ-13 Datasheet

https://www.DiGi-Electronics.com

DiGi Electronics Part Number	DMN65D8LQ-13-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	DMN65D8LQ-13
Description	MOSFET N-CH 60V 310MA SOT23
Detailed Description	N-Channel 60 V 310mA (Ta) 370mW (Ta) Surface Mount SOT-23-3

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Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
DMN65D8LQ-13	Diodes Incorporated
Series:	Product Status:
-	Active
FET Type:	Technology:
N-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
60 V	310mA (Ta)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
5V, 10V	3Ohm @ 115mA, 10V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
2V @ 250µA	0.87 nC @ 10 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±20V	22 pF @ 25 V
FET Feature:	Power Dissipation (Max):
-	370mW (Ta)
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Supplier Device Package:	Package / Case:
SOT-23-3	TO-236-3, SC-59, SOT-23-3
Base Product Number:	
DMN65	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.21.0095	

Lead-free Green

DMN65D8LQ

N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$	Package	I_D T_A = +25°C
60V	3Ω @ V_{GS} = 10V	SOT23	310mA
	4Ω @ V_{GS} = 5V		270mA

Description

This new generation 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.

Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- ESD Protected Gate
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

Applications

- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.

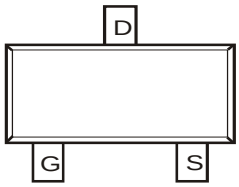
Mechanical Data

- Case: SOT23
- Case Material: Molded Plastic.
  UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Solderable per MIL-STD-202, Method 208
- Lead Free Plating - Matte Tin Finish Annealed over Alloy 42 Leadframe). (e3)
- Weight: 0.006 grams (Approximate)

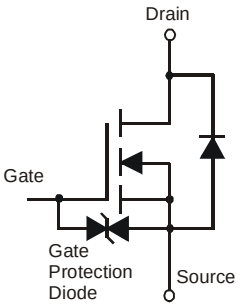
SOT23

ESD PROTECTED TO 1kV

Top View



Top View
Pin Configuration



Equivalent Circuit

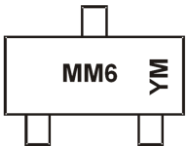
Ordering Information (Note 5)

Part Number	Case	Packaging
DMN65D8LQ-7	SOT23	3,000/Tape & Reel
DMN65D8LQ-13	SOT23	10,000/Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

DMN65D8LQ

Marking Information



MM6 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: Y = 2011)
M = Month (ex: 9 = September)

Date Code Key

Year	2011	……	2015	2016	2017	2018	2019	2020	2021	2022	2023
Code	Y	……	C	D	E	F	G	H	I	J	K

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

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	60	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 7) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +70°C	I_D	310 240	mA
Continuous Drain Current (Note 7) V_{GS} = 5V	Steady State	T_A = +25°C T_A = +70°C	I_D	270 210	mA
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	800	mA
Maximum Body Diode Continuous Current (Note 6)			I_S	500	mA

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation	(Note 7)	P_D	370	mW
	(Note 6)		540	
Thermal Resistance, Junction to Ambient	(Note 7)	$R_{\theta JA}$	348	°C/W
	(Note 6)		241	
Thermal Resistance, Junction to Case	(Note 6)	$R_{\theta JC}$	91	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes: 6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
7. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	60	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1.0	µA	V_{DS} = 60V, V_{GS} = 0V
Gate-Body Leakage	I_{GSS}	—	—	±5	µA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(th)}$	1.2	—	2.0	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	2	3	Ω	V_{GS} = 10V, I_D = 0.115A
		—	2.5	4	Ω	V_{GS} = 5V, I_D = 0.115A
Forward Transconductance	g_{FS}	80	290	—	mS	V_{DS} = 10V, I_D = 0.115A
Diode Forward Voltage	V_{SD}	—	0.8	1.2	V	V_{GS} = 0V, I_S = 115mA
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	22.0	—	pF	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	3.2	—		
Reverse Transfer Capacitance	C_{rss}	—	2.0	—		
Gate Resistance	R_G	—	79.9	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1.0MHz
Total Gate Charge V_{GS} = 10V	Q_g	—	0.87	—	nC	V_{GS} = 10V, V_{DS} = 30V, I_D = 150mA
Total Gate Charge V_{GS} = 4.5V	Q_g	—	0.43	—		
Gate-Source Charge	Q_{gs}	—	0.11	—		
Gate-Drain Charge	Q_{gd}	—	0.11	—		
Turn-On Delay Time	$t_{D(on)}$	—	2.7	—	nS	V_{DD} = 30V, I_D = 0.115A, V_{GEN} = 10V, R_{GEN} = 25Ω
Turn-On Rise Time	t_r	—	2.8	—		
Turn-Off Delay Time	$t_{D(off)}$	—	12.6	—		
Turn-Off Fall Time	t_f	—	7.3	—		

Notes: 8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to production testing.

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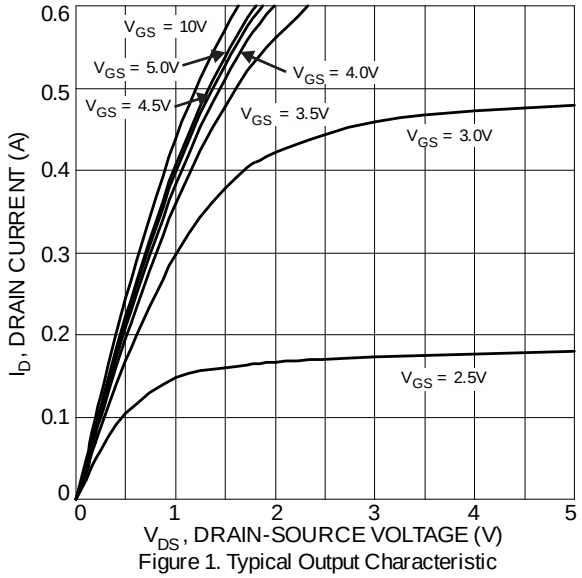


Figure 1. Typical Output Characteristic

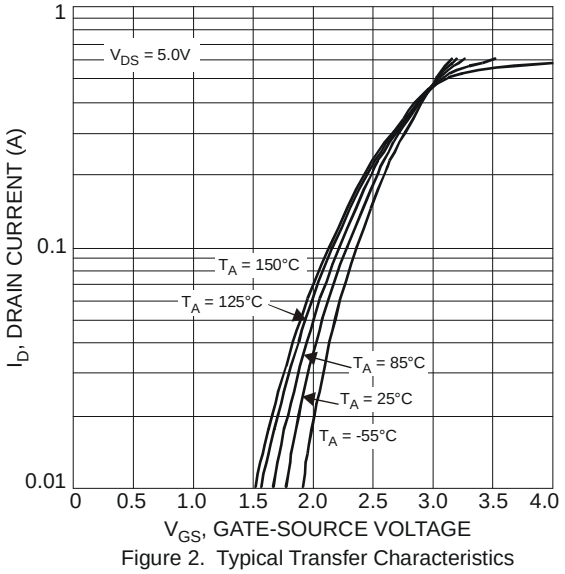


Figure 2. Typical Transfer Characteristics

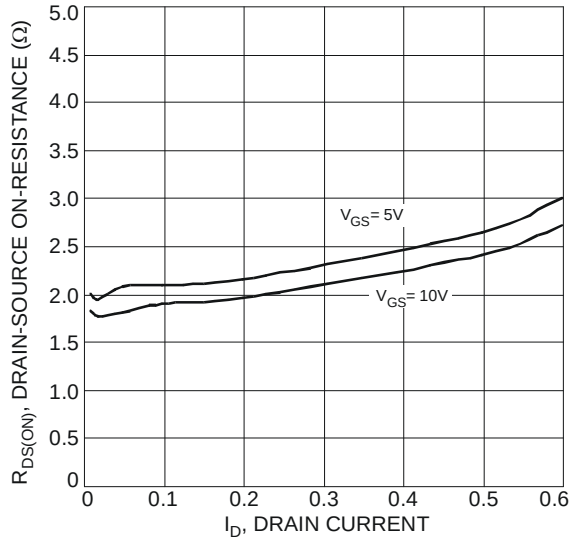


Figure 3. Typical On-Resistance vs. Drain Current and Temperature

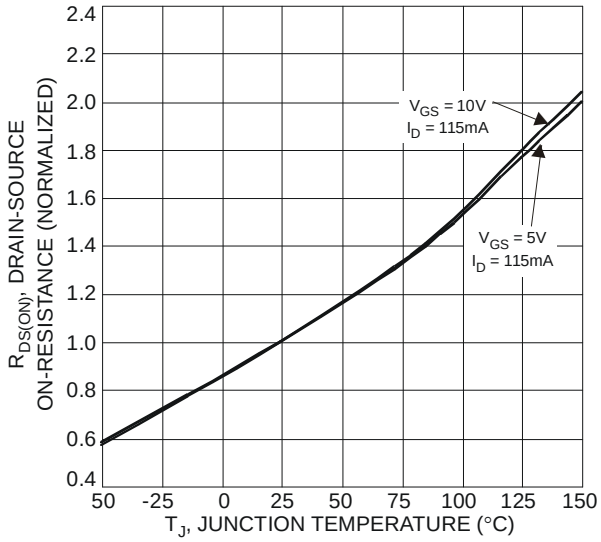


Figure 4. On-Resistance Variation with Temperature

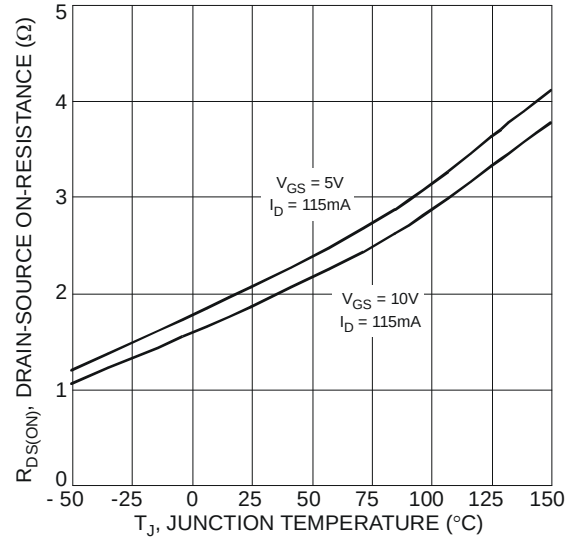


Figure 5. On-Resistance Variation with Temperature

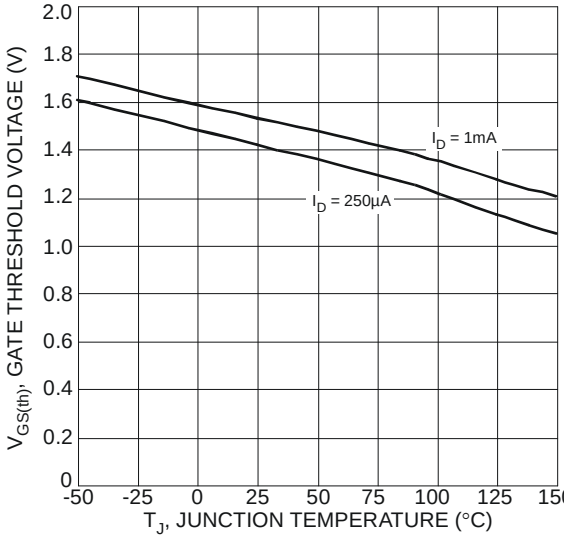


Figure 6. Gate Threshold Variation vs. Ambient Temperature

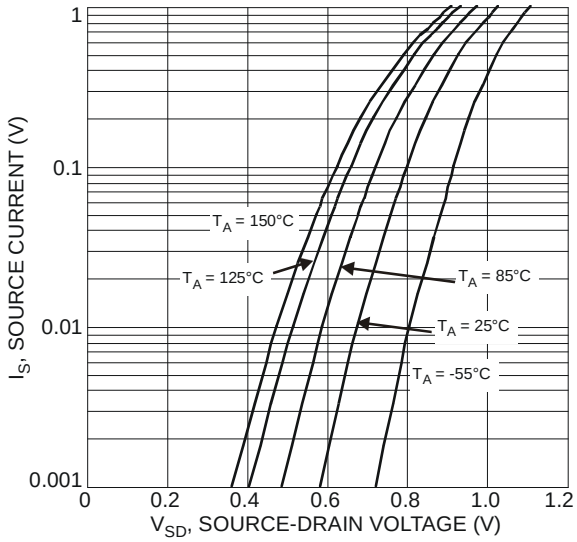


Figure 7. Diode Forward Voltage vs. Current

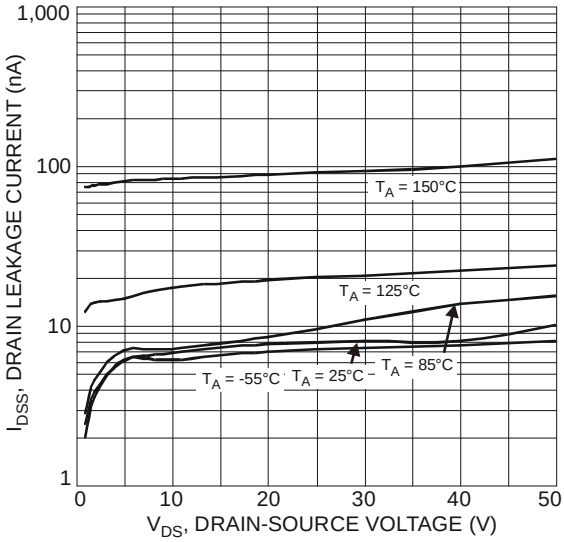


Figure 8. Typical Drain-Source Leakage Current vs. Voltage

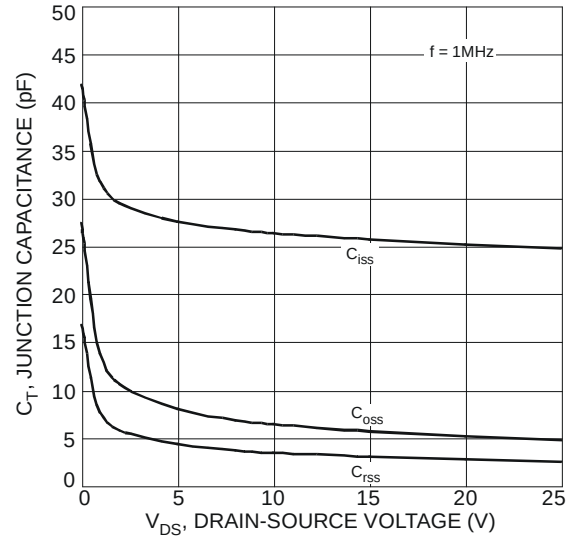


Figure 9. Typical Junction Capacitance

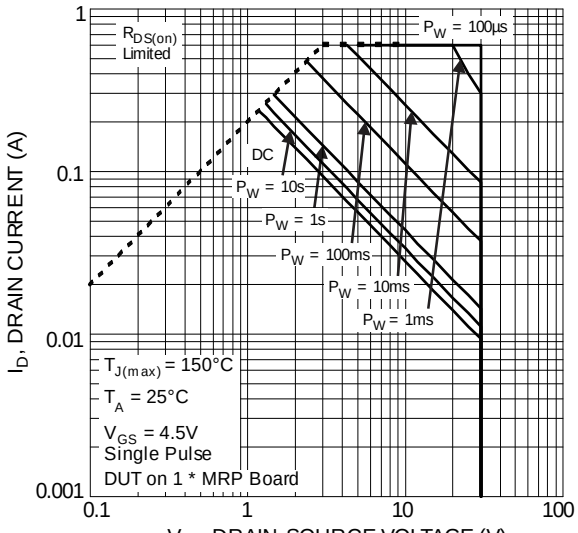


Figure 10 SOA, Safe Operation Area

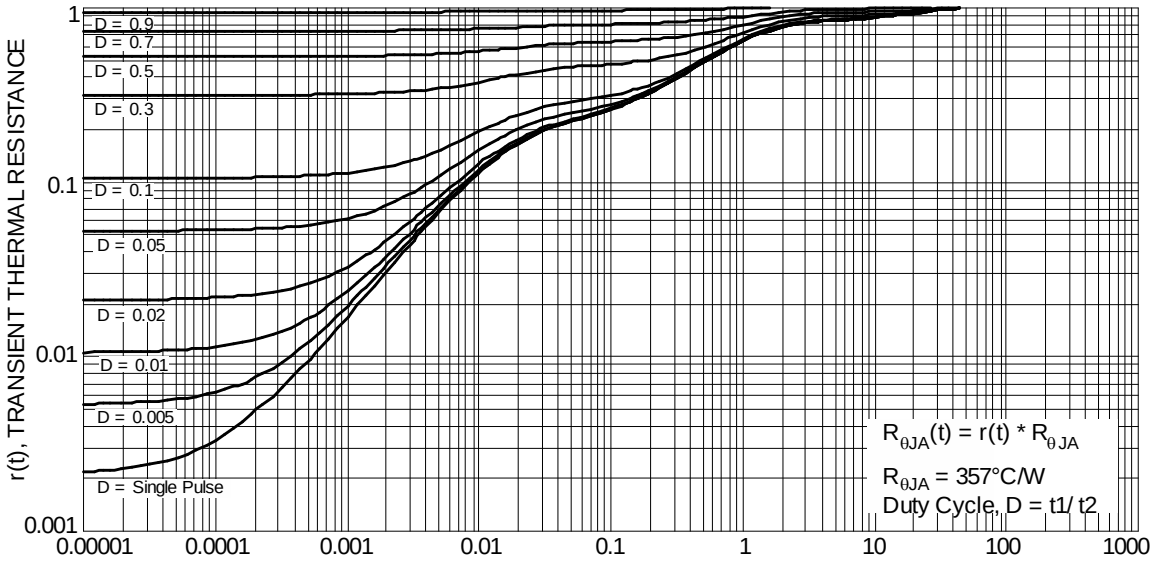
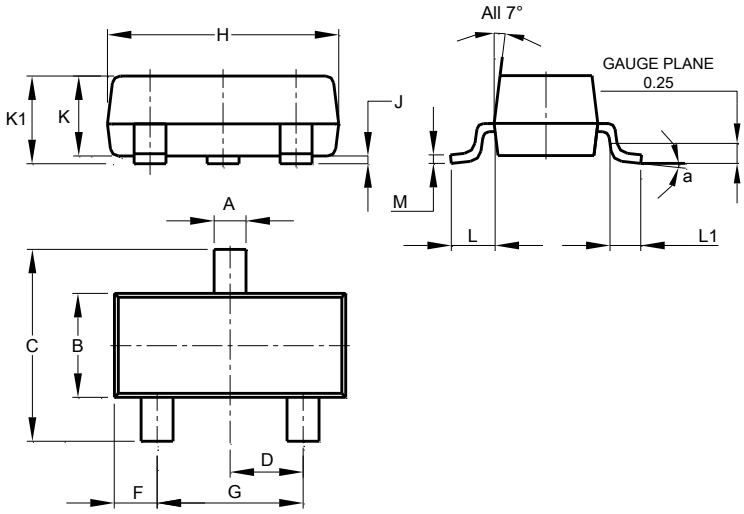


Figure 11 Transient Thermal Resistance

Package Outline Dimensions

Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.

SOT23

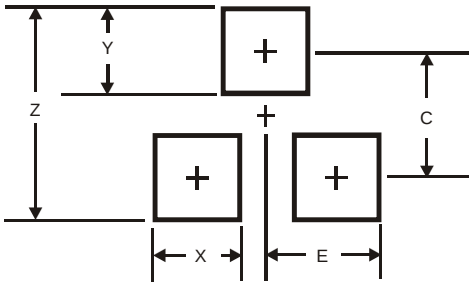


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°		
All Dimensions in mm			

Suggested Pad Layout

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.

SOT23



Dimensions	Value (in mm)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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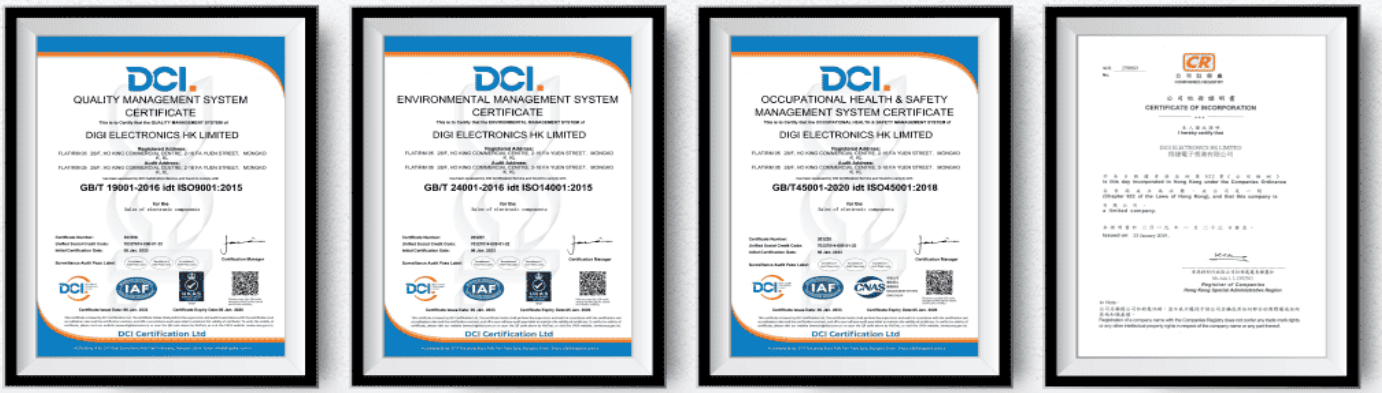

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