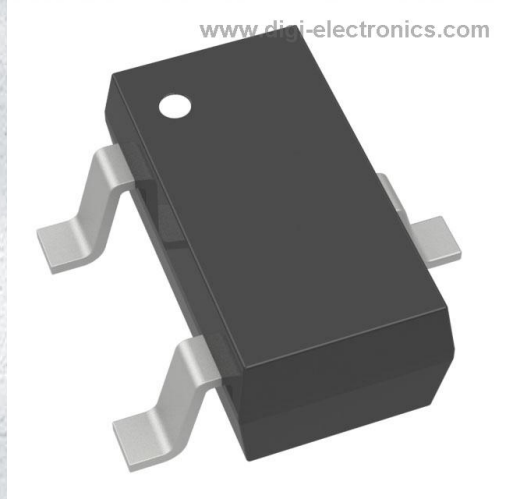
DMN3070SSN-7 Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	DMN3070SSN-7-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	DMN3070SSN-7
Description	MOSFET N-CH 30V 4.2A SC59
Detailed Description	N-Channel 30 V 4.2A (Ta) 780mW (Ta) Surface Mount SC-59-3

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
DMN3070SSN-7	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:
30 V	4.2A (Ta)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
4.5V, 10V	40mOhm @ 4.2A, 10V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
2.1V @ 250µA	13.2 nC @ 10 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±20V	697 pF @ 15 V
FET Feature:	Power Dissipation (Max):
-	780mW (Ta)
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Supplier Device Package:	Package / Case:
SC-59-3	TO-236-3, SC-59, SOT-23-3
Base Product Number:	
DMN3070	

Environmental & Export classification

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

NEW PRODUCT

Lead-free Green

DMN3070SSN

30V N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)\ MAX}$	Package	I_D T_A = +25°C
30V	40mΩ @ V_{GS} = 10V	SC59	5.1A
	50mΩ @ V_{GS} = 4.5V		4.3A

Description

This new generation 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.

Applications

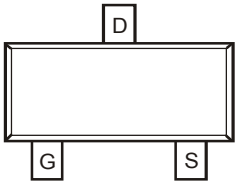
- Load Switch
- DC-DC Converters
- Power Management Functions

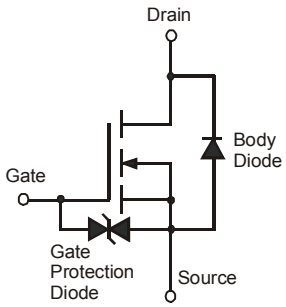
Features

- Low On-Resistance
- **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**

Mechanical Data

- Case: SC59
- Case Material – Molded Plastic. UL Flammability Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Solderable per MIL-STD-202, Method 208 e3
- Terminal Connections: See Diagram
- Weight: 0.014 grams (approximate)
-



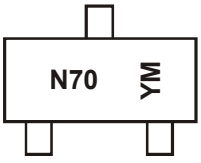


Ordering Information (Note 4)

Part Number	Case	Packaging
DMN3070SSN-7	SC59	3000/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. For packaging details, go to our website at http"//www.diodes.com/products/packages.html

Marking Information



N70 = Product Type Marking Code
YM = Date Code Marking
Y = Year ex: Z = 2012
M = Month ex: 9 = September

Date Code Key

Year	2010	2011	2012	2013	2014	2015	2016	2017
Code	X	Y	Z	A	B	C	D	E

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

DMN3070SSN

NEW PRODUCT

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	±20	V
Continuous Drain Current (Note 6) V_{GS} = 10V	Steady State	T_A = +25°C T_A = +70°C	I_D	4.2 3.3	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	5.1 4	A
Continuous Drain Current (Note 6) V_{GS} = 4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	3.7 2.8	A
	t<10s	T_A = +25°C T_A = +70°C	I_D	4.3 3.3	A
Pulsed Drain Current (10µs pulse, duty cycle = 1%)			I_{DM}	60	A
Maximum Body Diode Forward Current (Note 6)			I_S	2	A

Thermal Characteristics

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	0.78	W
	T_A = +70°C		0.5	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	$R_{\theta JA}$	160	°C/W
	t<10s		115	°C/W
Total Power Dissipation (Note 6)	T_A = +25°C	P_D	1.3	W
	T_A = +70°C		0.8	
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	$R_{\theta JA}$	96	°C/W
	t<10s		68	°C/W
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	18	°C/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 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}	30	—	—	V	V_{GS} = 0V, I_D = 250µA
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1	µA	V_{DS} =24V, V_{GS} = 0V
Gate-Body Leakage	I_{GSS}	—	—	±10	µA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	$V_{GS(th)}$	1.1	—	2.1	V	V_{DS} = V_{GS}, I_D = 250µA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	24	40	mΩ	V_{GS} = 10V, I_D = 4.2A
		—	30	50		V_{GS} = 4.5V, I_D = 2A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	2.7	—	S	V_{DS} = 5V, I_D =4.2A
Diode Forward Voltage	V_{SD}	—	0.75	1.0	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C_{iss}	—	697	—	pF	V_{DS} = 15V, V_{GS} = 0V f = 1.0MHz
Output Capacitance	C_{oss}	—	97	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	67	—	pF	
Gate Resistance	R_g	—	1.47	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	6	—	nC	V_{DS} = 15V, I_D = 9A
Total Gate Charge (V_{GS} = 10V)	Q_g	—	13.2	—		
Gate-Source Charge	Q_{gs}	—	2.2	—		
Gate-Drain Charge	Q_{gd}	—	1.8	—		
Turn-On Delay Time	$t_{D(ON)}$	—	4.3	—	ns	V_{DD}=15V,V_{GEN}=10V,R_{GEN} = 6Ω, R_L=15Ω
Turn-Off Delay Time	$t_{D(OFF)}$	—	4.4	—	ns	
Turn-On Rise Time	t_r	—	20.1	—	ns	
Turn-Off Fall Time	t_f	—	4.1	—	ns	
Reverse Recovery Time	t_{rr}	—	7.3	—	Ns	I_F = 9A, di/dt = 500A/µs
Reverse Recovery Charge	Q_{rr}	—	7.9	—	nC	I_F = 9A, di/dt = 500A/µs

Notes:
5. Device mounted on FR-4 PCB with minimum recommended pad layout, single sided. The power dissipation P_D is based on t<10s $R_{\theta JA}$.
6. Device mounted on 1" x 1" FR-4 PCB with high coverage 2 oz. Copper, single sided. The power dissipation P_D is based on t<10s $R_{\theta JA}$.
7. Short duration pulse test used to minimize self-heating effect.
8. Guaranteed by design. Not subject to production testing.

NEW PRODUCT

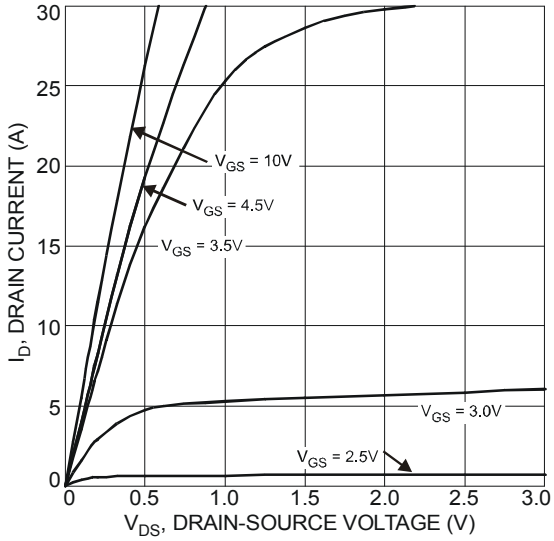


Figure 1 Typical Output Characteristic

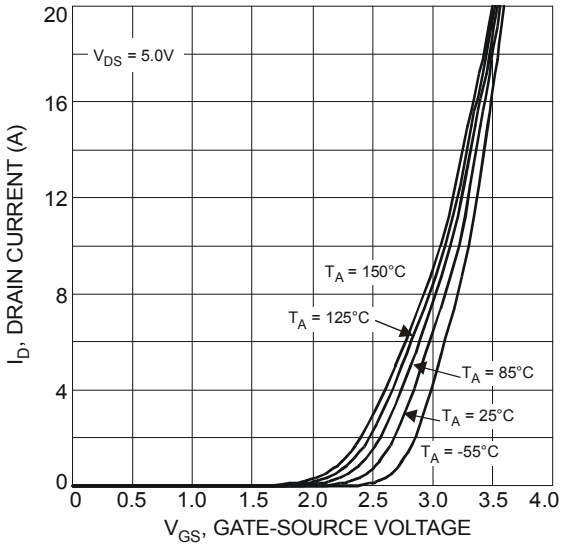


Figure 2 Typical Transfer Characteristics

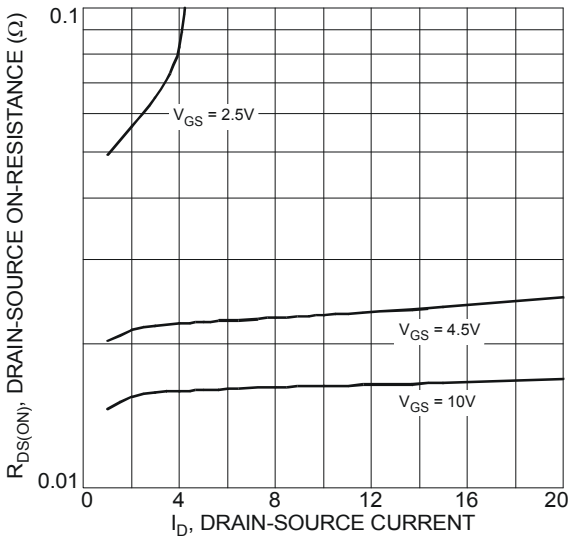


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

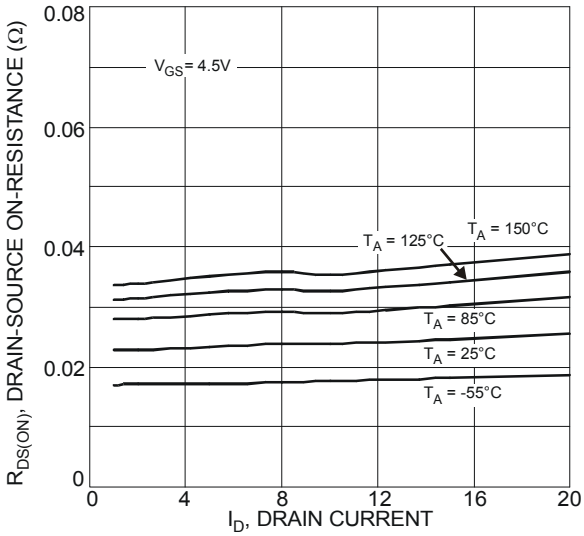


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

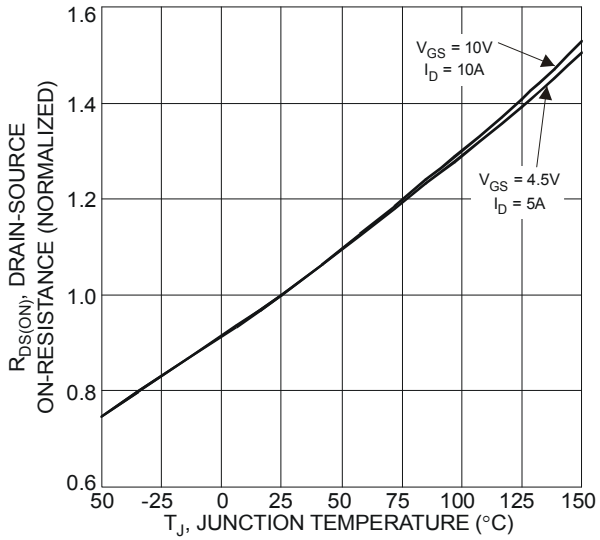


Figure 5 On-Resistance Variation with Temperature

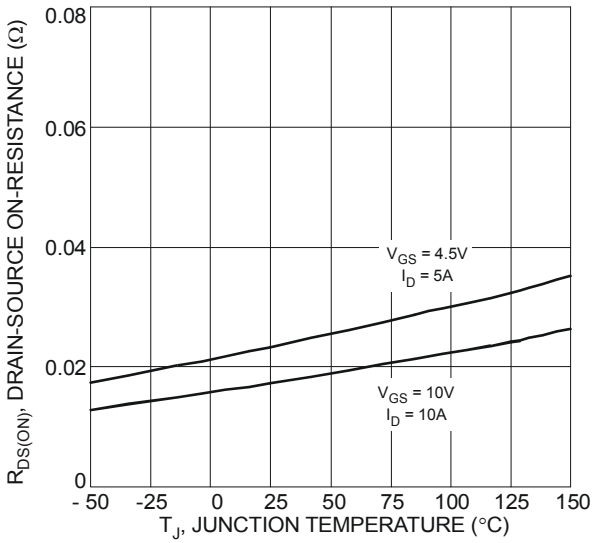


Figure 6 On-Resistance Variation with Temperature

NEW PRODUCT

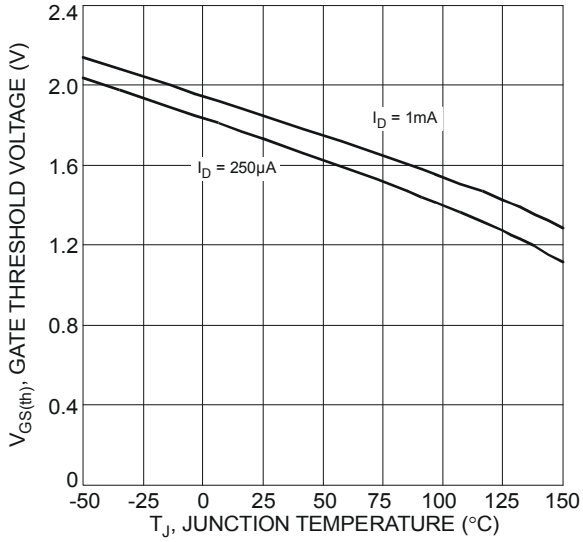


Figure 7 Gate Threshold Variation vs. Ambient Temperature

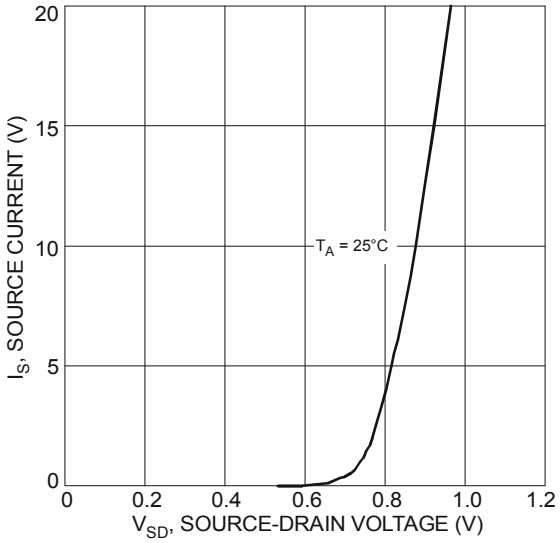


Figure 8 Diode Forward Voltage vs. Current

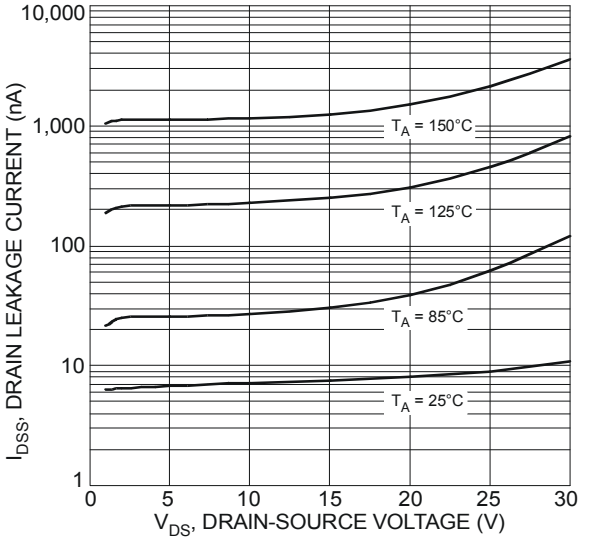


Figure 9 Typical Drain-Source Leakage Current vs. Voltage

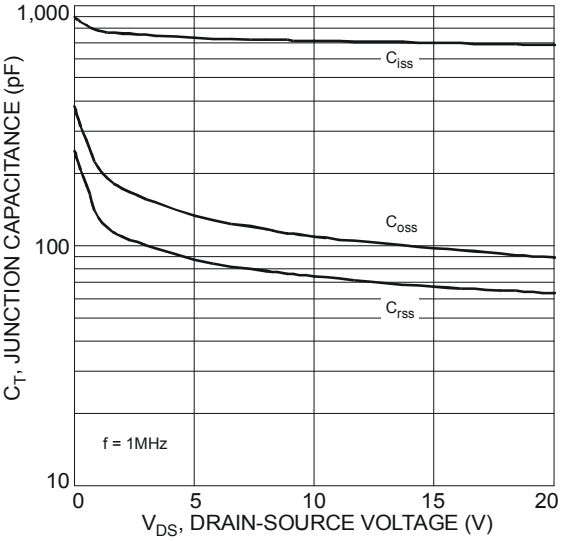


Figure 10 Typical Junction Capacitance

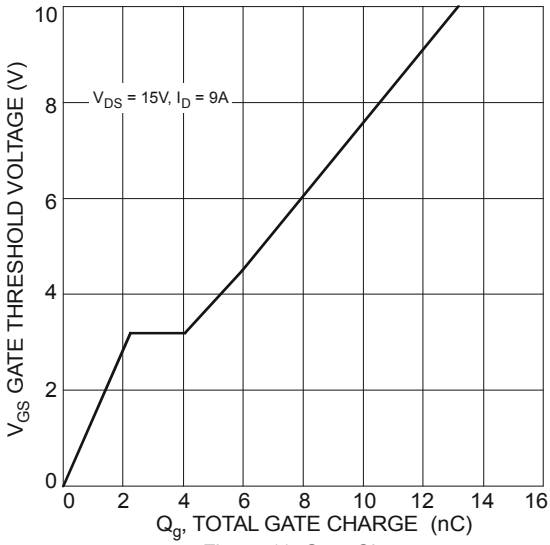
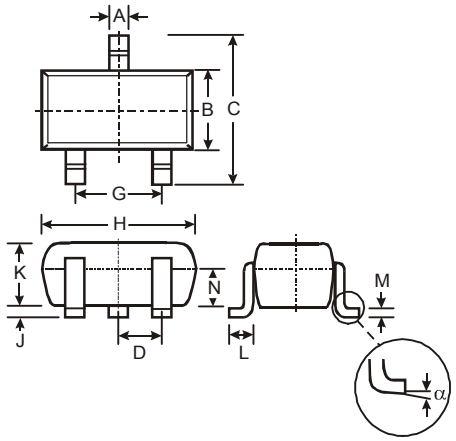


Figure 11 Gate Charge

NEW PRODUCT

Package Outline Dimensions

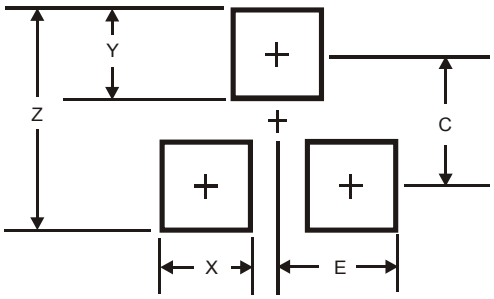
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SC59			
Dim	**Min**	**Max**	**Typ**
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	-	-	0.95
G	-	-	1.90
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
N	0.70	0.80	0.75
α	0°	8°	-
All Dimensions in mm			

Suggested Pad Layout

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



Dimensions	Value (in mm)
Z	3.4
X	0.8
Y	1.0
C	2.4
E	1.35

NEW PRODUCT

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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.

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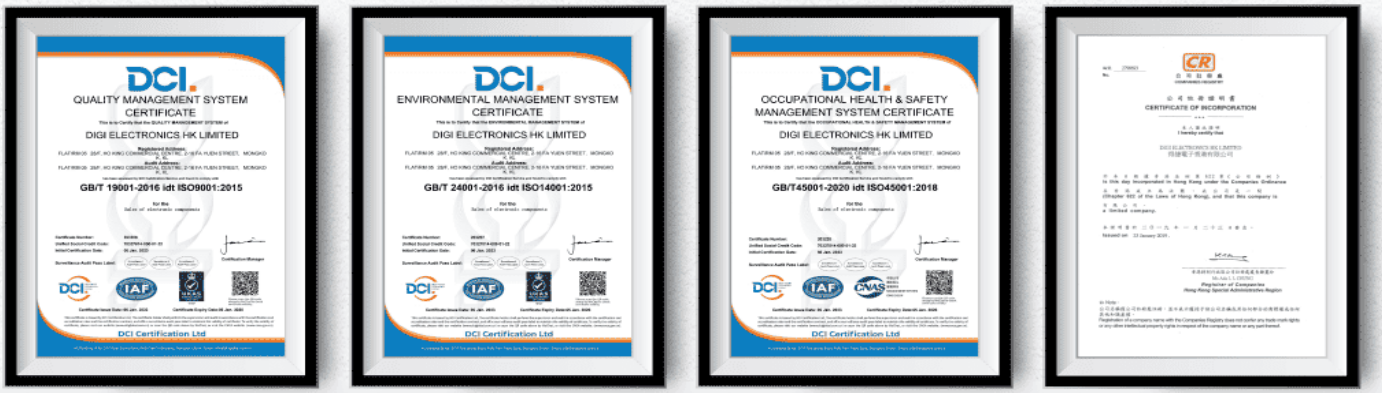

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