FDC6901L Datasheet

DiGi Electronics Part Number	FDC6901L-DG
Manufacturer	onsemi
Manufacturer Product Number	FDC6901L
Description	IC PWR SWITCH P-CH 1:1 SUPERSOT6
Detailed Description	Power Switch/Driver 1:1 P-Channel 3A SuperSOT™ -6

https://www.DiGi-Electronics.com

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
FDC6901L	onsemi
Series:	Product Status:
-	Obsolete
Switch Type:	Number of Outputs:
General Purpose	1
Ratio - Input:Output:	Output Configuration:
1:1	-
Output Type:	Interface:
P-Channel	On/Off
Voltage - Load:	Voltage - Supply (Vcc/Vdd):
2.7V ~ 6V	-
Current - Output (Max):	Rds On (Typ):
3A	105mOhm
Input Type:	Features:
Non-Inverting	Slew Rate Controlled
Fault Protection:	Operating Temperature:
-	-55°C ~ 150°C (TJ)
Mounting Type:	Supplier Device Package:
Surface Mount	SuperSOT™-6
Package / Case:	Base Product Number:
SOT-23-6 Thin, TSOT-23-6	FDC6901

Environmental & Export classification

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

FAIRCHILD SEMICONDUCTOR®

February 2008

FDC6901L
Integrated Load Switch

Features

- Three Programmable Slew Rates
- Reduces Inrush Current
- Minimizes EMI
- Normal Turn-Off Speed
- Low-Power CMOS Operates Over Wide Voltage Range
- High Performance Trench Technology for Extremely low $R_{DS(ON)}$
- RoHS Compliant

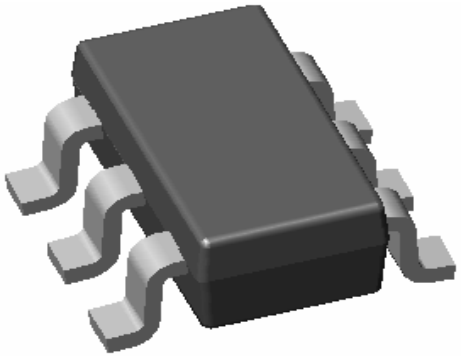
Applications

- Load switch
- Power management

General Description

This device is particularly suited for compact power management. In portable electronic equipment where 2.5V to 6V input capability is needed. This load switch integrates a Slew Rate Control Driver that drives a P-Channel Power MOSFET in one tiny SuperSOT™-6 package. The integrated slew rate control driver is specifically designed to control the turn on of the P-Channel MOSFET in order to limit the inrush current in battery switching applications with high capacitance loads. For turn-off, the IC pulls the MOSFET gate up quickly.

Pin 1

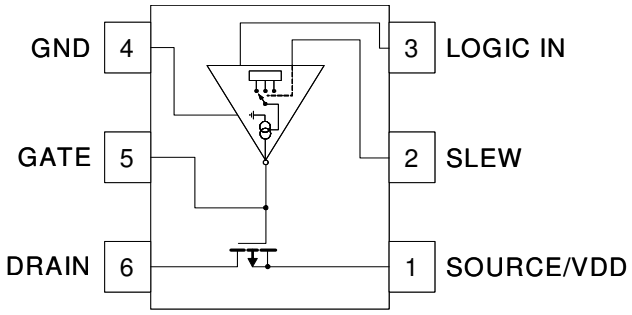


SuperSOT™-6

Package Marking and Ordering Information

Device Marking	Device	Reel Size	Tape Width	Quantity
.901	FDC6901L	7”	8mm	3000 units

Pin Configuration



Absolute Maximum Ratings

Parameter	Min.	Max.	Unit
Supply Voltage	-0.5	10	V
DC Input Voltage (Logic Inputs)	-0.7	9	V
Power Dissipation			
Storage Junction Temperature	-55	150	℃
Thermal Resistance, Junction to Ambient		180	℃/W
Thermal Resistance, Junction to Case		60	℃/W

Recommended Operating Range

Parameter	Min.	Max.	Unit
Supply Voltage	2.7	6	V
Operating Junction Temperature	-55	150	℃

Electrical Characteristics

T_A = 25℃ unless otherwise noted

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Units
Logic Levels							
Logic High Input Voltage	V_{IH}	V_{DD} = 2.7V to 6.0V		70% V_{DD}			V
Logic Low Input Voltage	V_{IL}	V_{DD} = 2.7V to 6.0V				25% V_{DD}	V
Off Characteristics - Slew Rate Control Driver							
Supply Input Breakdown Voltage	BV_{DG}	I_{DG} = 10µA, V_{IN} = 0V, V_{SLEW} = 0V		9			V
Slew Input Breakdown Voltage	BV_{SLEW}	I_{SLEW} = 10µA, V_{IN} = 0V		9			V
Logic Input Breakdown Voltage	BV_{IN}	I_{IN} = 10µA, V_{SLEW} = 0V		9			V
Supply Input Leakage Current	IR_{DG}	V_{DG} = 8V, V_{IN} = 0V, V_{SLEW} = 0V				100	nA
Slew Input Leakage Current	IR_{SLEW}	V_{SLEW} = 8V, V_{IN} = 0V				100	nA
Logic Input Leakage Current	IR_{IN}	V_{IN} = 8V, V_{SLEW} = 0V				100	nA
Off Characteristics - Slew Rate Control Driver + P-Channel MOSFET							
MOSFET Breakdown Voltage	BV_{DSS}	I_D = -250µA		9			V
MOSFET Leakage Current	I_{DSS}	V_R = 16V				100	nA
On Characteristics - Slew Rate Control Driver							
Output/Gate Current	I_G	I_D = -250µA	Slew Pin = Open	90			µA
			Slew Pin = GND	1			µA
			Slew Pin = V_{DD}	10			nA

Electrical Characteristics Cont.

T_A = 25°C unless otherwise noted

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Units
On Characteristics - P-Channel MOSFET							
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250µA		-0.6	-1	-1.5	V
Static Drain-Source On Resistance	$R_{DS(ON)}$	V_{GS} = -4.5V, I_D = -1.5A			120	145	mΩ
		V_{GS} = -2.5V, I_D = -1.2A			170	210	mΩ
On Characteristics - Slew Rate Control Driver + P-Channel MOSFET							
Dropout Voltage	V_{DROP}	V_{DD} = 6V, V_{IN} = 2.5V to 6V, I_L = 1.5A			160	300	mV
		V_{DD} = 6V, V_{IN} = 2.5V to 6V, I_L = 1.2A			130	300	mV
Load Switch On Resistance	R_{ON}	V_{DD} = 6V, V_{IN} = 2.5V to 6V, I_L = 1.5A			105	180	mΩ
		V_{DD} = 6V, V_{IN} = 2.5V to 6V, I_L = 1.2A			110	210	mΩ
Load Current	I_{LOAD}	V_{GS} = 2.5 V, V_{DS} = 6 V		3			A
P-Channel Switching Times (V_{SUPPLY} = 5.5V, V_{DD} = 5.5V, Logic IN = 5.5V, I_{LOAD} = 1.5A)							
Delay On Time	td_{ON}	Slew Pin	= Open		6.2		µs
			= GND		42		µs
			= V_{DD}		115		µs
V_{OUT} Rise Time	t_R	Slew Pin	= Open		6.75		µs
			= GND		124		µs
			= V_{DD}		162		µs
Output Slew Rate	dv/dt	Slew Pin	= Open		600		V/ms
			= GND		41		V/ms
			= V_{DD}		24		V/ms

Typical Characteristics

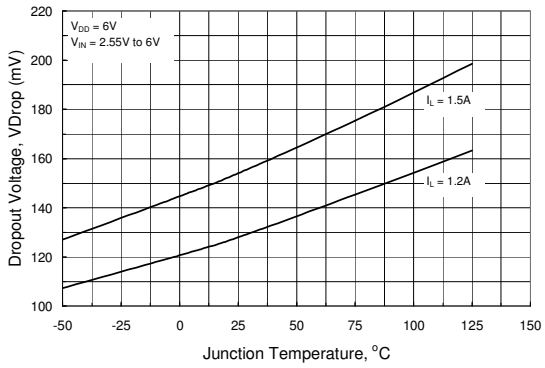


Figure 1. Dropout Voltage vs. Temperature
(SLEW = OPEN)

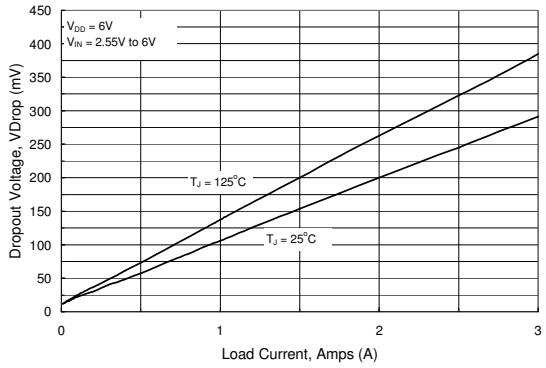


Figure 2. Dropout Voltage vs. Load Current
(SLEW = OPEN)

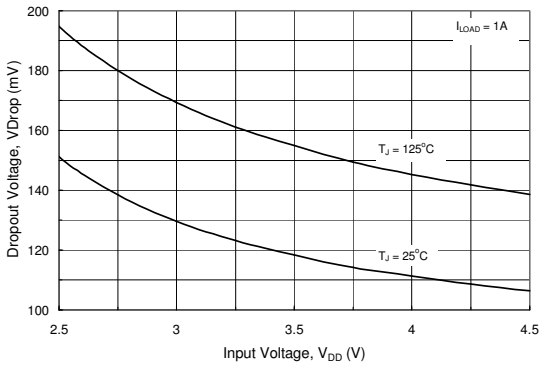


Figure 3. Dropout Voltage vs. Input Voltage
(SLEW = OPEN)

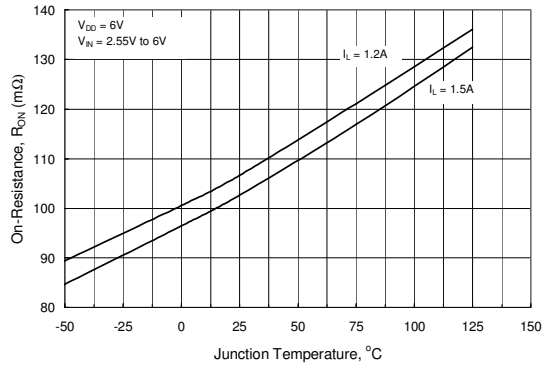


Figure 4. On Resistance vs. Temperature
(SLEW = OPEN)

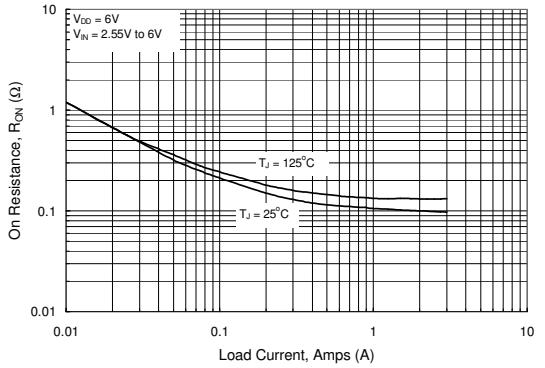


Figure 5. On Resistance vs. Load Current
(SLEW = OPEN)

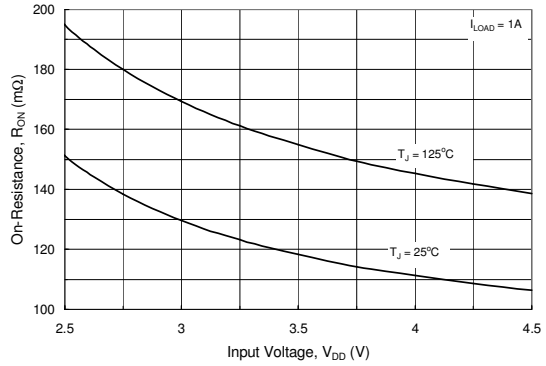


Figure 6. On Resistance vs. Input Voltage
(SLEW = OPEN)

Typical Characteristics

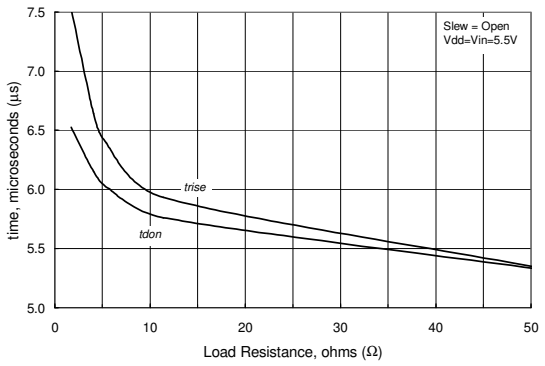


Figure 7. Switching Time vs. Load Resistance
(SLEW = OPEN)

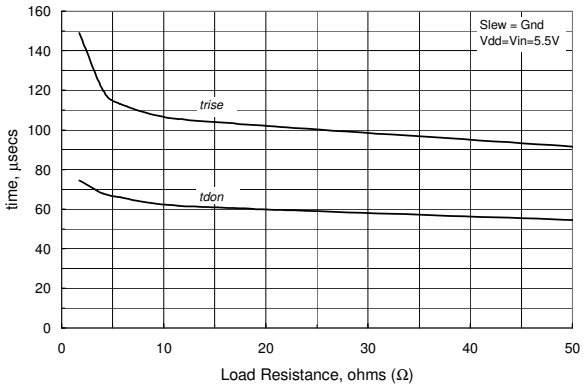


Figure 8. Switching Time vs. Load Resistance
(SLEW = GROUND)

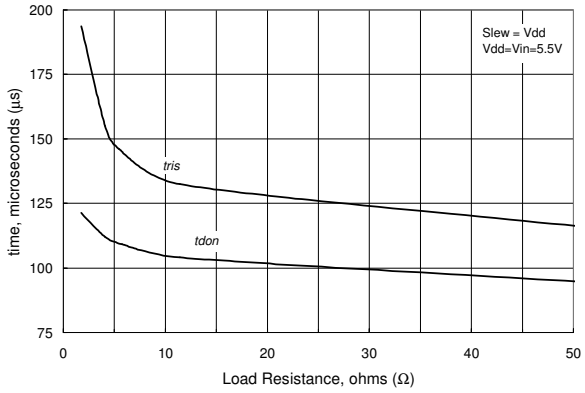


Figure 9. Switching Time vs. Load Resistance
(SLEW = V_{DD})

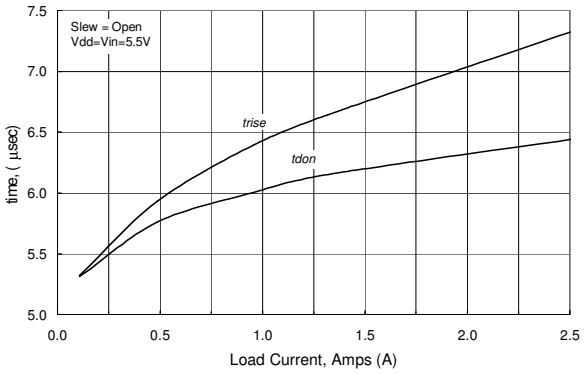


Figure 10. Switching Time vs. Load Current
(SLEW = OPEN)

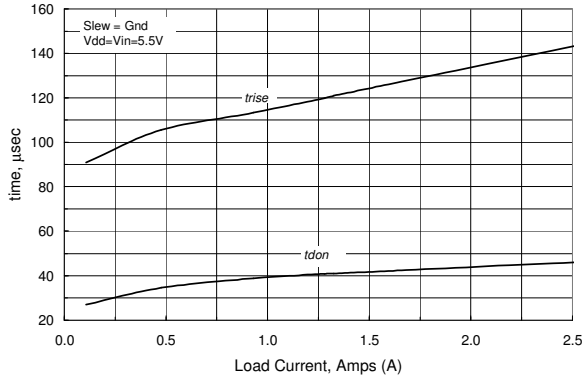


Figure 11. Switching Time vs. Load Current
(SLEW = GROUND)

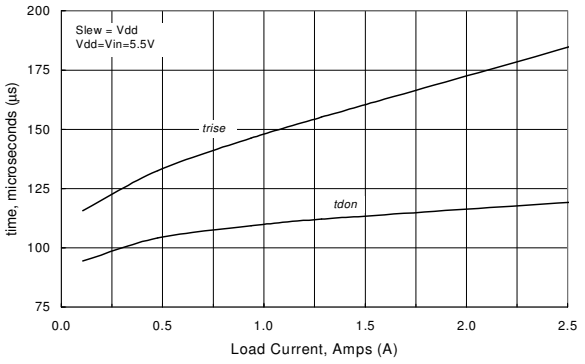
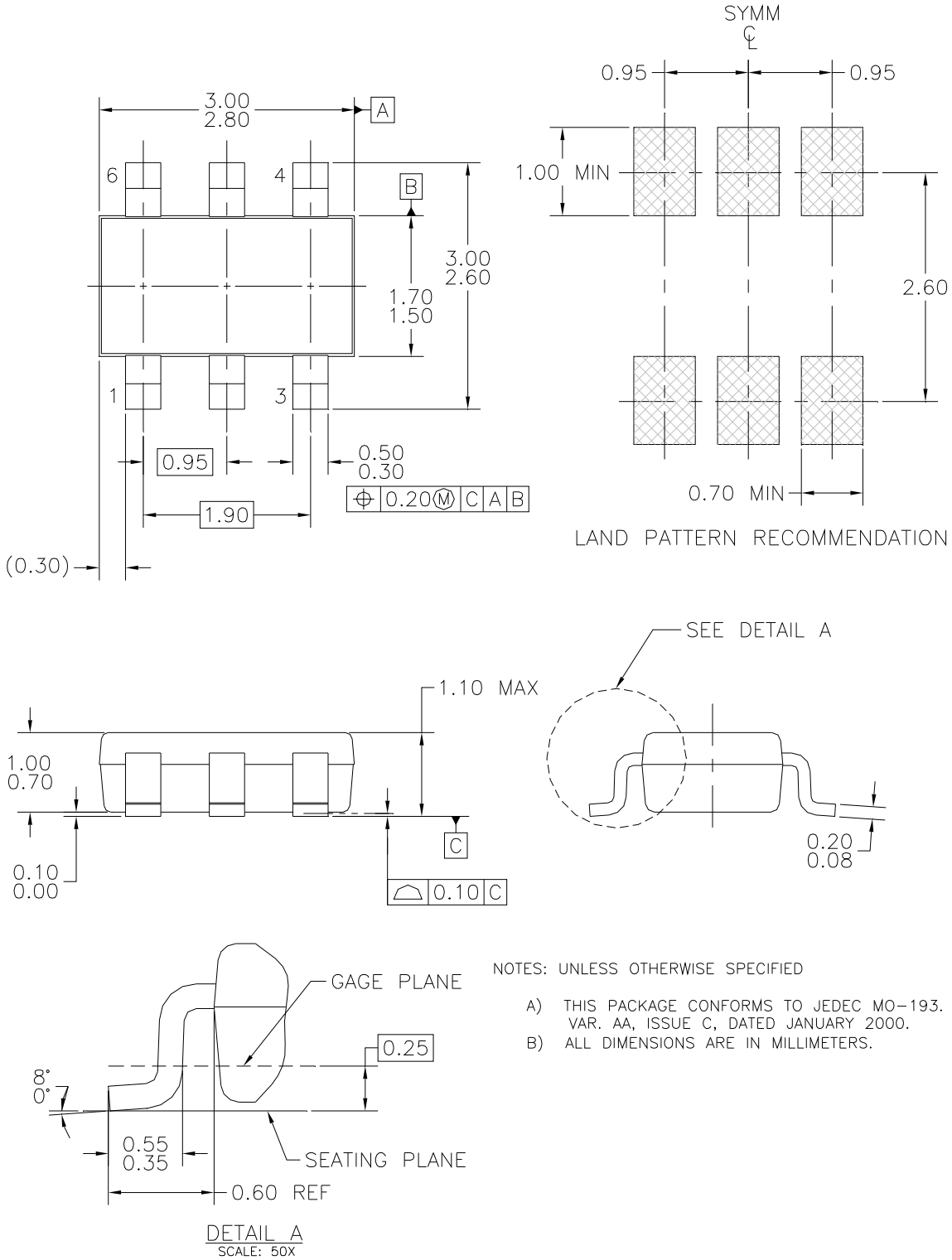


Figure 12. Switching Time vs. Load Current
(SLEW = V_{DD})

Dimensional Outline and Pad Layout



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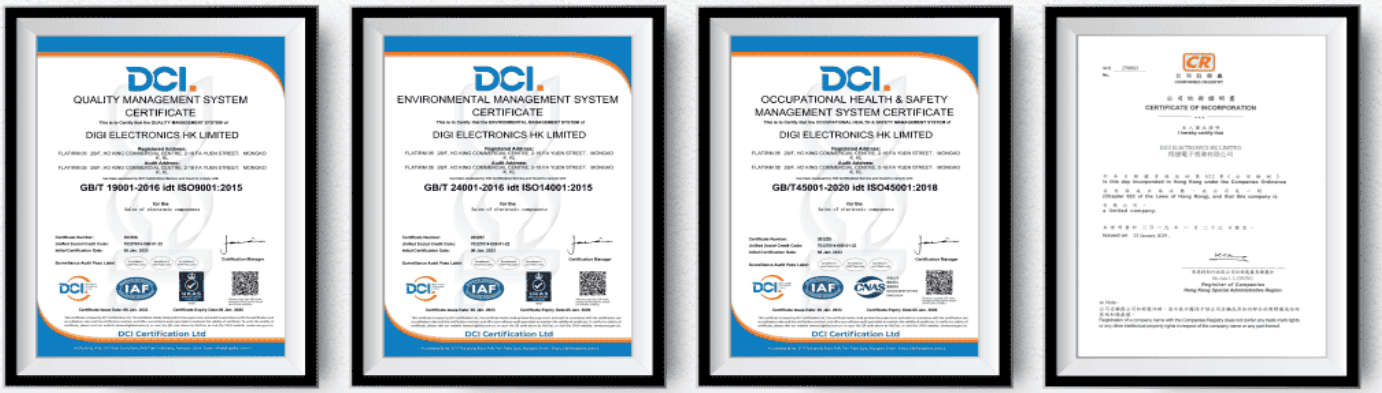

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