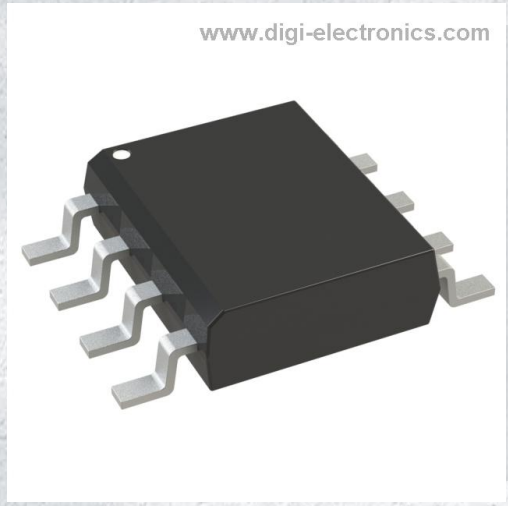
DMG4496SSS-13 Datasheet



DiGi Electronics Part Number	DMG4496SSS-13-DG
Manufacturer	Diodes Incorporated
Manufacturer Product Number	DMG4496SSS-13
Description	MOSFET N-CH 30V 10A 8SOP
Detailed Description	N-Channel 30 V 10A (Ta) 1.42W (Ta) Surface Mount 8-SO

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Tel: +00 852-30501935

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Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
DMG4496SSS-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:
30 V	10A (Ta)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
4.5V, 10V	21.5mOhm @ 10A, 10V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
2V @ 250µA	10.2 nC @ 10 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±25V	493.5 pF @ 15 V
FET Feature:	Power Dissipation (Max):
-	1.42W (Ta)
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Supplier Device Package:	Package / Case:
8-SO	8-SOIC (0.154", 3.90mm Width)
Base Product Number:	
DMG4496	

Environmental & Export classification

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

Lead-free Green

DMG4496SSS

N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max T_A = +25°C
30V	21.5mΩ @ V_{GS} = 10V	10A
	29mΩ @ V_{GS} = 4.5V	8A

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.

Applications

- Backlighting
- Power Management Functions
- DC-DC Converters

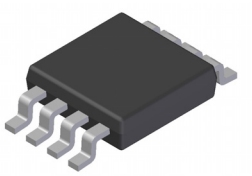
Features and Benefits

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **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**

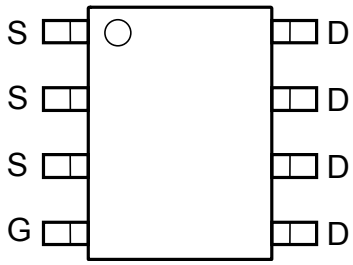
Mechanical Data

- Case: SO-8
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections Indicator: See diagram
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.074 grams (approximate)

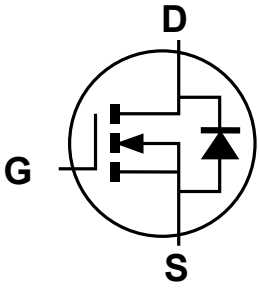
SO-8



Top View



Top View
Internal Schematic



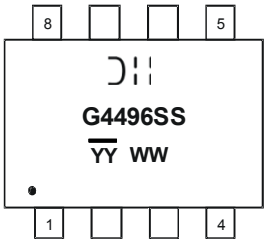
Equivalent circuit

Ordering Information (Note 4 & 5)

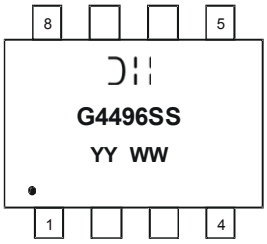
Part Number	Compliance	Case	Packaging
DMG4496SSS-13	Standard	SO-8	2500 / Tape & Reel
DMG4496SSSQ-13	Automotive	SO-8	2500 / Tape & Reel

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_grade_definitions/.
5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



Chengdu A/T Site



Shanghai A/T Site

Ↄ¦¦ = Manufacturer's Marking
G4496SS = Product Type Marking Code
YYWW = Date Code Marking
YY or $\overline{YY}$ = Year (ex: 13 = 2013)
WW = Week (01 - 53)
$\underline{YY}$ = Date Code Marking for SAT (Shanghai Assembly/ Test site)
$\overline{YY}$ = Date Code Marking for CAT (Chengdu Assembly/ Test site)

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	30	V
Gate-Source Voltage			V_{GSS}	±25	V
Continuous Drain Current (Note 6)	Steady State	T_A = +25°C T_A = +85°C	I_D	10 6	A
Pulsed Drain Current (Note 7)			I_{DM}	60	A
Avalanche Current (Notes 7 & 8)			I_{AR}	8	A
Repetitive Avalanche Energy (Notes 7 & 8) L = 0.1mH			E_{AR}	3.2	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_D	1.42	W
Thermal Resistance, Junction to Ambient @T_A = +25°C (Note 6)	$R_{\theta JA}$	88.49	°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 9)						
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} = 30V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±25V, V_{DS} = 0V
ON CHARACTERISTICS (Note 9)						
Gate Threshold Voltage	$V_{GS(th)}$	0.8	1.2	2.0	V	V_{DS} = V_{GS}, I_D = 250μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	16 22	21.5 29	mΩ	V_{GS} = 10V, I_D = 10A V_{GS} = 4.5V, I_D = 7.5A
Forward Transfer Admittance	$\|Y_{fs}\|$	—	11.7	—	S	V_{DS} = 5V, I_D = 10A
Diode Forward Voltage	V_{SD}	—	0.70	1	V	V_{GS} = 0V, I_S = 1A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C_{iss}	—	493.5	—	pF	V_{DS} =15V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	94.5	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	50.4	—	pF	
Gate Resistance	R_g	—	2.86	—	Ω	V_{DS} =0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = 4.5V)	Q_g	—	4.7	—	nC	V_{DS} = 15V, V_{GS} = 4.5V, ID =10A
Total Gate Charge (V_{GS} = 10V)	Q_g	—	10.2	—		V_{DS} = 15V, V_{GS} = 10V, ID =10A
Gate-Source Charge	Q_{gs}	—	1.4	—	nC	
Gate-Drain Charge	Q_{gd}	—	1.7	—	nC	
Turn-On Delay Time	$t_{D(on)}$	—	4.76	—	ns	V_{GS} = 10V, V_{Ds} = 15V, R_G = 6Ω, R_L = 15Ω,
Turn-On Rise Time	t_r	—	3.64	—	ns	
Turn-Off Delay Time	$t_{D(off)}$	—	19.5	—	ns	
Turn-Off Fall Time	t_f	—	4.9	—	ns	

Notes:
6. Device mounted on 1 in.^{2} FR-4 board with 2oz. Copper, in a still air environment @ T_A = +25°C. The value in any given application depends on the user's specific board design.
7. Repetitive rating, pulse width limited by junction temperature.
8. I_{AR} and E_{AR} rating are based on low frequency and duty cycles to keep T_J = 25°C
9. Short duration pulse test used to minimize self-heating effect.
10. Guaranteed by design. Not subject to production testing.

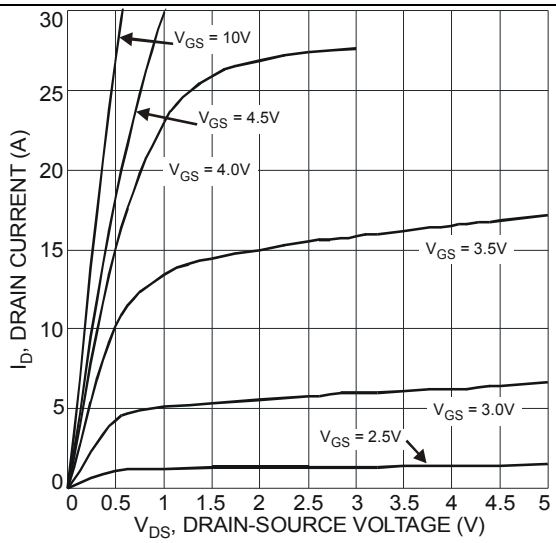


Fig. 1 Typical Output Characteristic

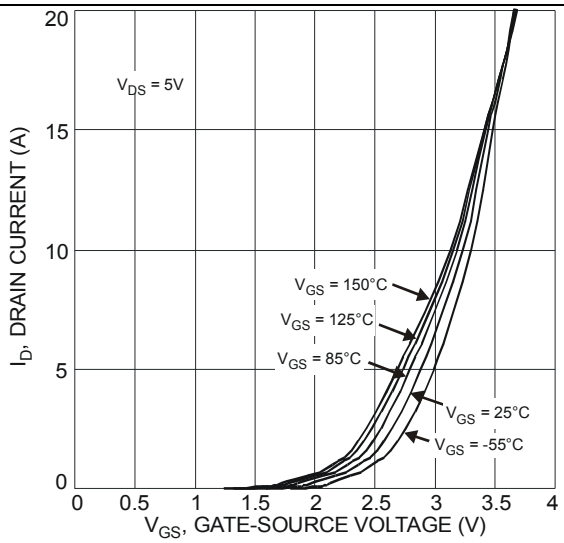


Fig. 2 Typical Transfer Characteristic

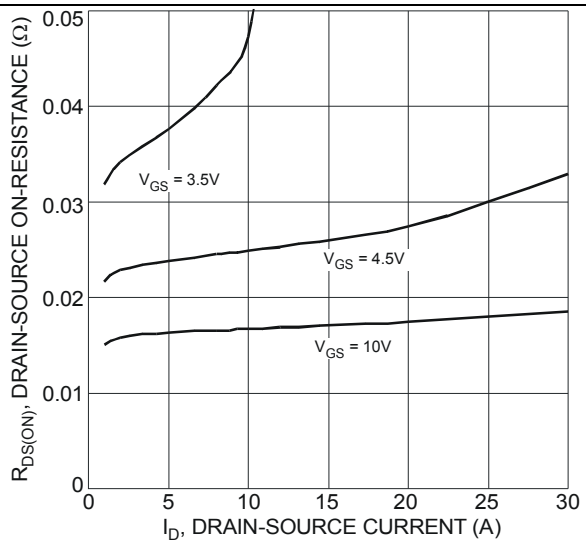


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

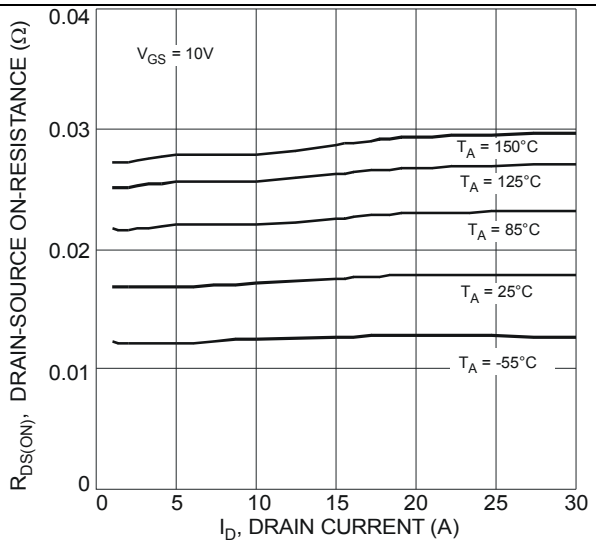


Fig. 4 Typical On-Resistance
vs. Drain Current and Temperature

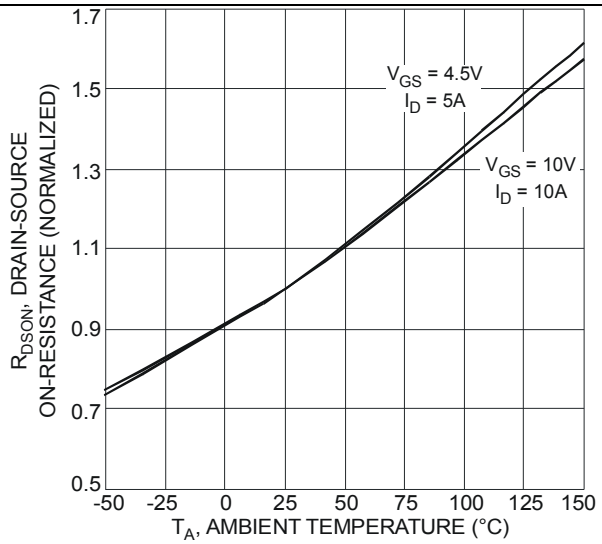


Fig. 5 On-Resistance Variation with Temperature

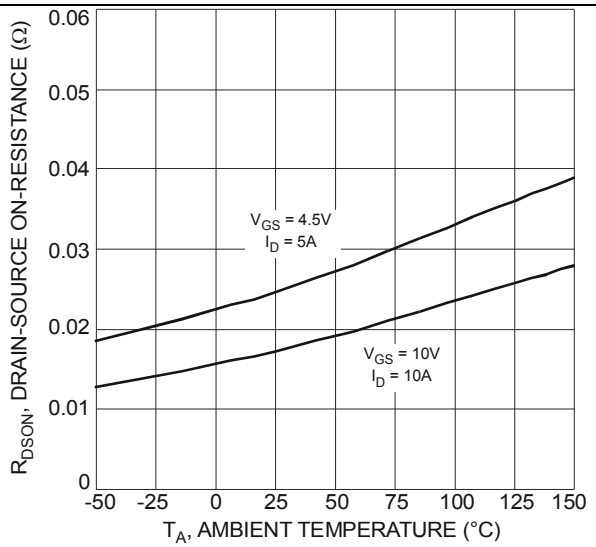


Fig. 6 On-Resistance Variation with Temperature

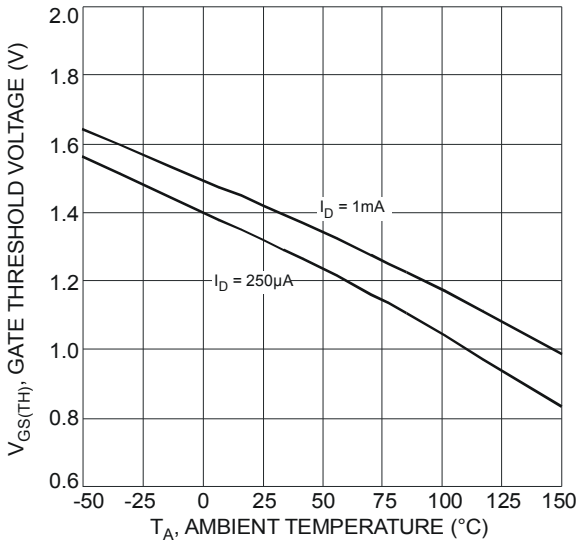


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

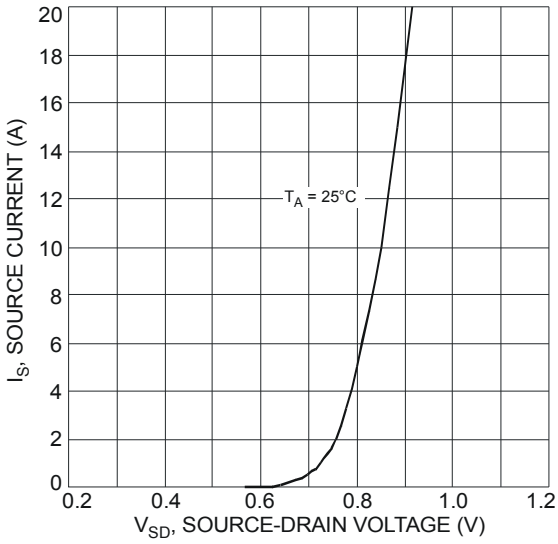


Fig. 8 Diode Forward Voltage vs. Current

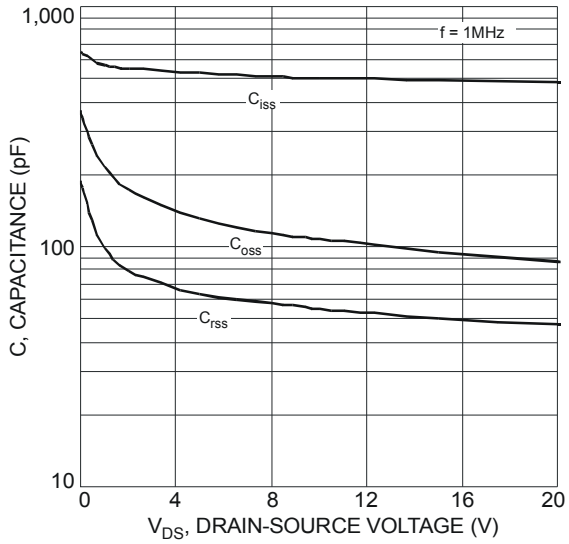


Fig. 9 Typical Total Capacitance

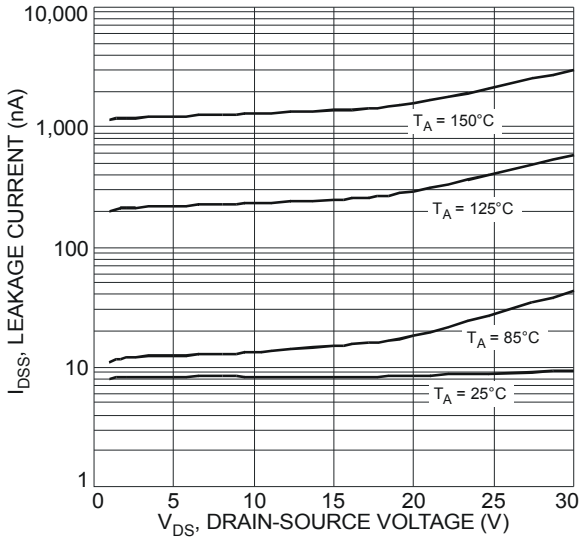


Fig. 10 Typical Leakage Current vs. Drain-Source Voltage

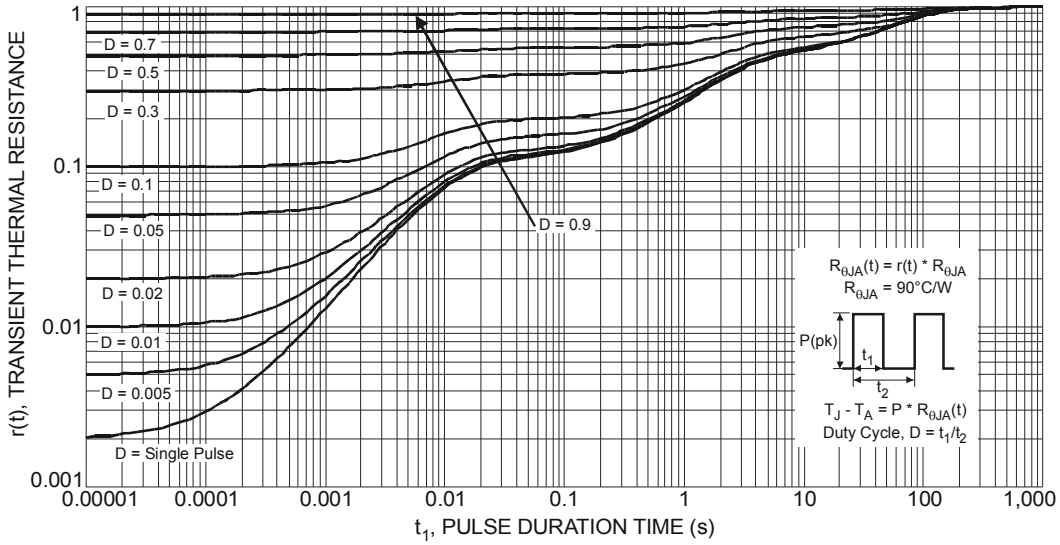
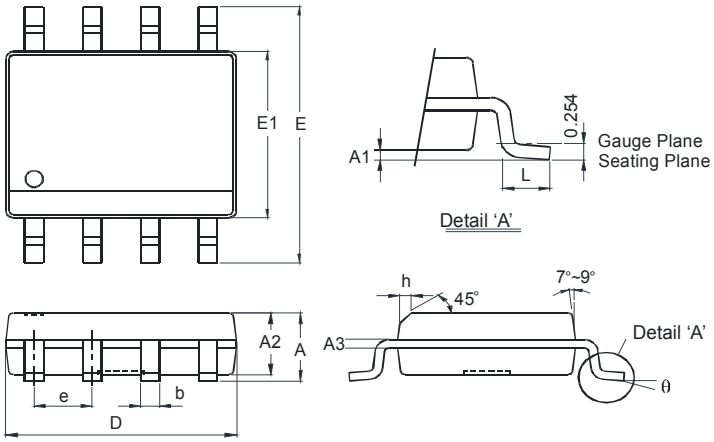


Fig. 11 Transient Thermal Response

Package Outline Dimensions

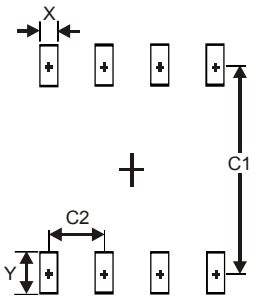
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SO-8		
Dim	**Min**	**Max**
A	-	1.75
A1	0.10	0.20
A2	1.30	1.50
A3	0.15	0.25
b	0.3	0.5
D	4.85	4.95
E	5.90	6.10
E1	3.85	3.95
e	1.27 Typ	
h	-	0.35
L	0.62	0.82
θ	0°	8°
All Dimensions in mm		

Suggested Pad Layout

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



Dimensions	Value (in mm)
X	0.60
Y	1.55
C1	5.4
C2	1.27

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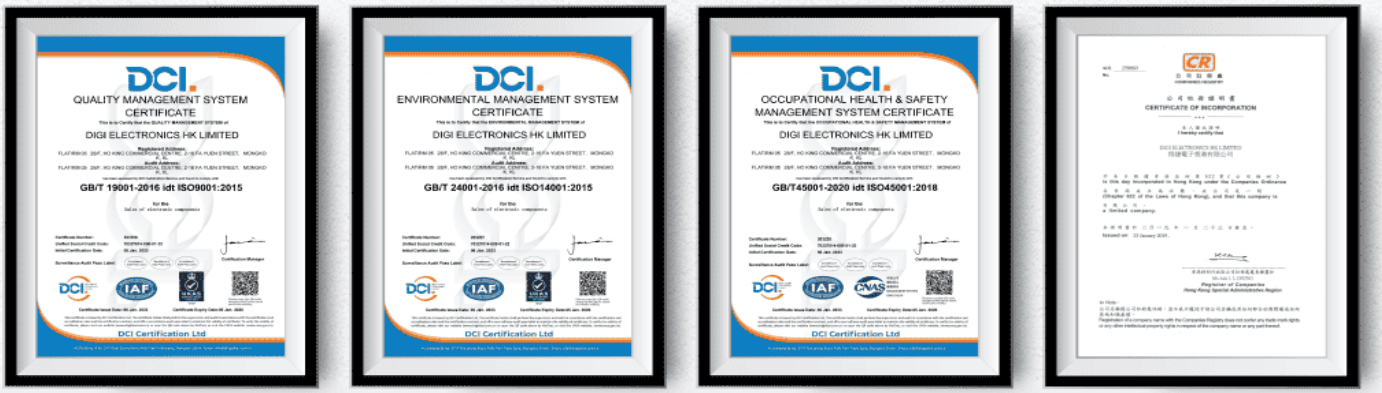

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