

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON) \text{ max}}$	$I_D \text{ MAX}$ $T_A = +25^\circ\text{C}$
-12V	48mΩ @ $V_{GS} = -4.5\text{V}$	-3.8A
	59mΩ @ $V_{GS} = -2.5\text{V}$	-3.4A
	80mΩ @ $V_{GS} = -1.8\text{V}$	-2.9A

Description

This new generation MOSFET is 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

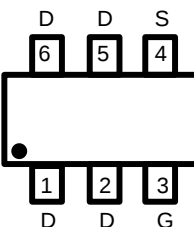
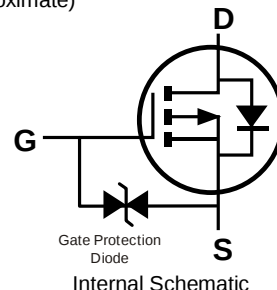
- DC-DC Converters
- Power Management Functions
- Battery Operated Systems and Solid-State Relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.



SOT363



Top View


 Top View
Pin out


Features

- Low On-Resistance
- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- Small Surface Mount Package
- ESD Protected
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

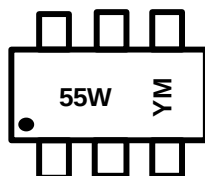
- Case: SOT363
- Case Material: Molded Plastic.
UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Alloy 42 Leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 ③
- Terminal Connections: See Diagram
- Weight: 0.006 grams (Approximate)

Ordering Information (Note 4)

Part Number	Case	Packaging
DMP1055USW-7	SOT363	3,000/Tape & Reel
DMP1055USW-13	SOT363	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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



55W = Product Type Marking Code
 YM = Date Code Marking
 Y or Y̅ = Year (ex: D = 2016)
 M = Month (ex: 9 = September)

Date Code Key

Year	2016	2017	2018	2019	2020	2021	2022	2023
Code	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}	-12	V
Gate-Source Voltage			V _{GSS}	±8	V
Continuous Drain Current (Note 6) V _{GS} = -4.5V	Steady State	T _A = +25°C T _A = +70°C	I _D	-3.8 -3.0	A
Maximum Continuous Body Diode Forward Current (Note 6)			I _S	-1.7	A
Pulsed Drain Current (10μs pulse, duty cycle = 1%)			I _{DM}	-20	A

Thermal Characteristics

Characteristic			Symbol	Value	Units
Total Power Dissipation (Note 5)			P _D	0.66	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State		R _{θJA}	192	°C/W
Total Power Dissipation (Note 6)			P _D	1.03	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State		R _{θJA}	123	°C/W
Thermal Resistance, Junction to Case			R _{θJC}	39	°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}	-12	-	-	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	-	-	-1.0	μA	V _{DS} = -12V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	-	-	±10	μA	V _{GS} = ±8V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	-0.4	-	-1	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	-	41	48	mΩ	V _{GS} = -4.5V, I _D = -3.0A
		-	49	59		V _{GS} = -2.5V, I _D = -1.0A
		-	69	80		V _{GS} = -1.8V, I _D = -1.0A
		-	110	150		V _{GS} = -1.5V, I _D = -0.5A
		-	-	-		V _{GS} = 0V, I _S = -3.7A
Diode Forward Voltage	V _{SD}	-	-0.7	-1.2	V	V _{GS} = 0V, I _S = -3.7A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{ISS}	-	1,028	-	pF	V _{DS} = -6V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{OSS}	-	285	-	pF	
Reverse Transfer Capacitance	C _{RSS}	-	254	-	pF	
Gate Resistance	R _g	-	19.6	-	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = -4.5V)	Q _g	-	13	-	nC	V _{DS} = -10V, I _D = -4.7A
Total Gate Charge (V _{GS} = -8V)		-	20.8	-	nC	
Gate-Source Charge	Q _{gs}	-	1.8	-	nC	
Gate-Drain Charge	Q _{gd}	-	4.5	-	nC	
Turn-On Delay Time	t _{D(ON)}	-	5.6	-	ns	V _{DD} = -6V, V _{GS} = -4.5V, R _L = 1.6Ω, R _G = 1Ω
Turn-On Rise Time	t _R	-	12.8	-	ns	
Turn-Off Delay Time	t _{D(OFF)}	-	30.7	-	ns	
Turn-Off Fall Time	t _F	-	25.4	-	ns	
Body Diode Reverse Recovery Time	t _{RR}	-	31.6	-	ns	I _S = -3.6A, dI/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	-	7.8	-	nC	I _S = -3.6A, dI/dt = 100A/μs

- Notes:
- Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to production testing.

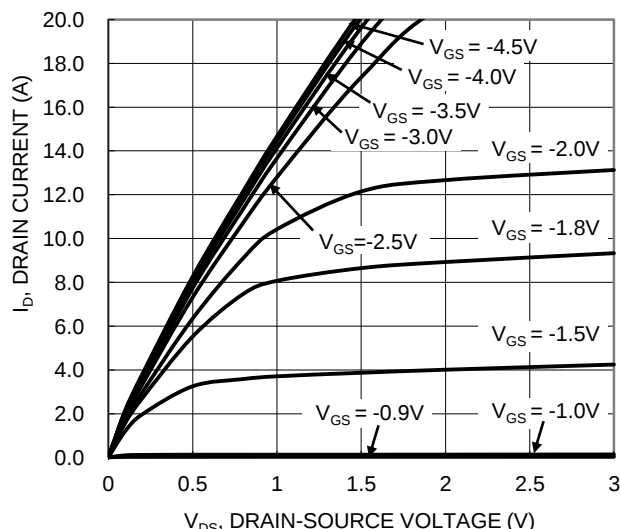


Figure 1. Typical Output Characteristic

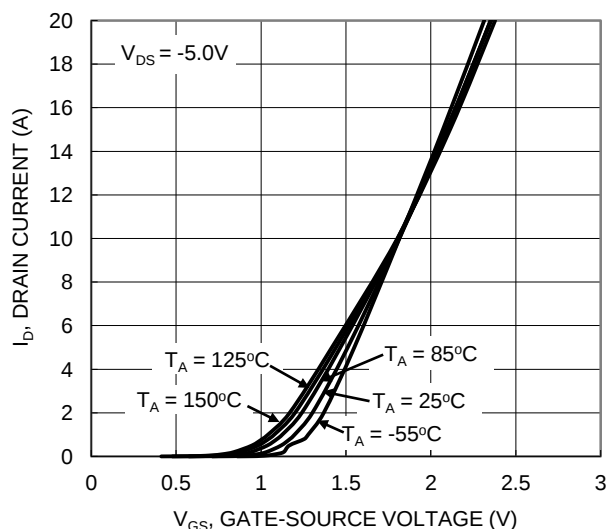


Figure 2. Typical Transfer Characteristic

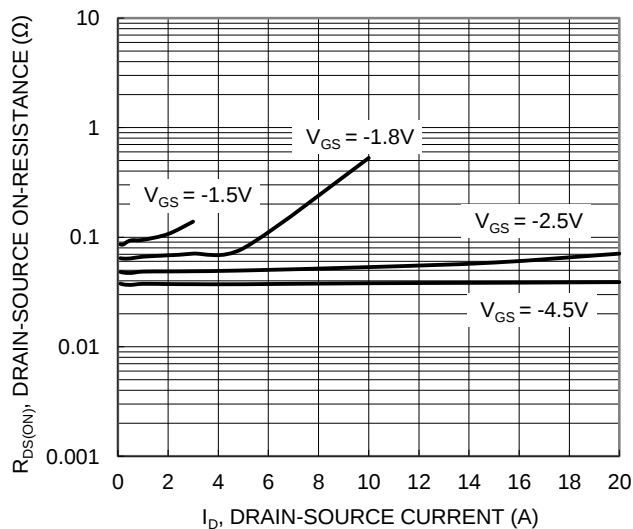


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

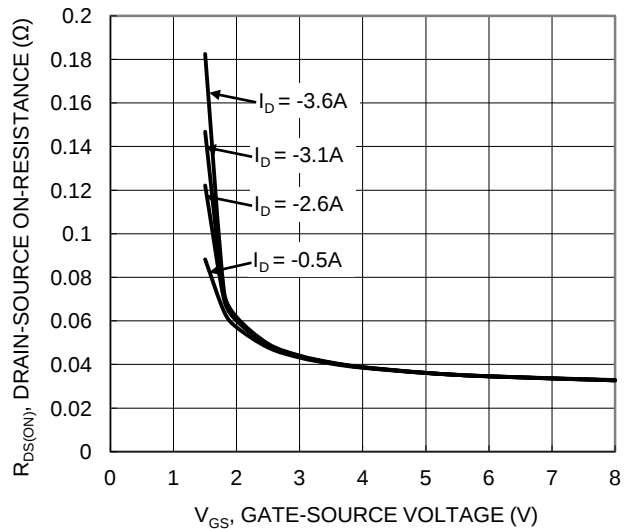


Figure 4. Typical Transfer Characteristic

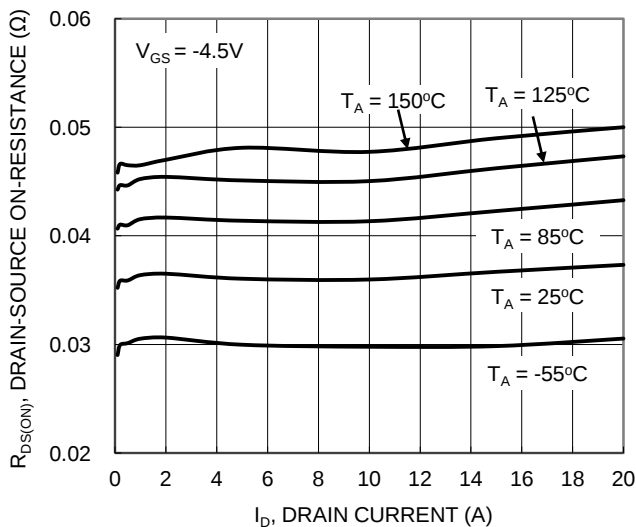


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

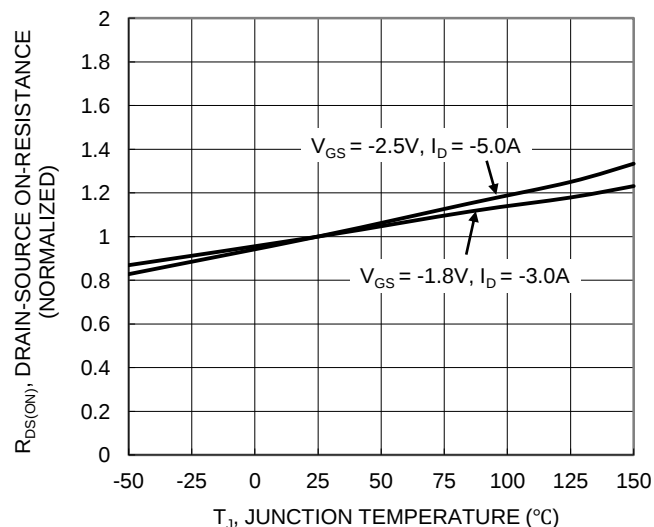
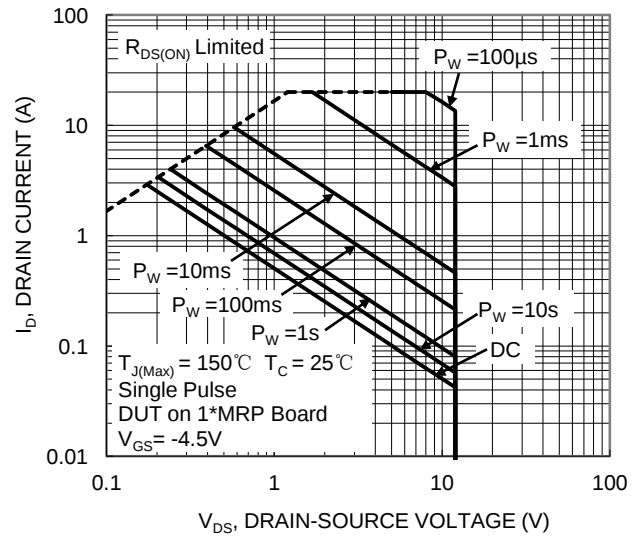
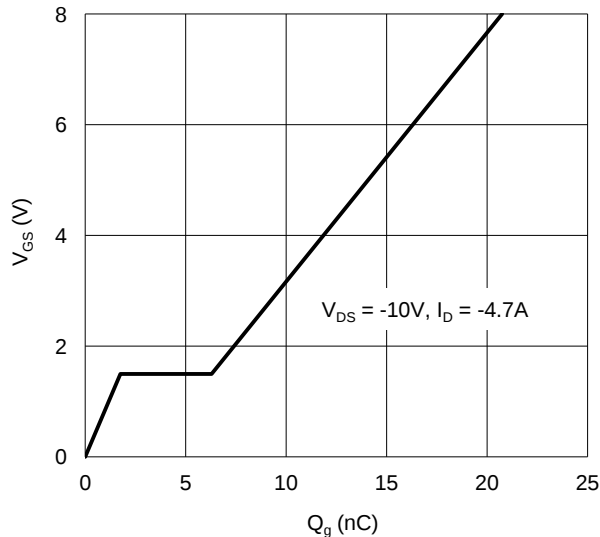
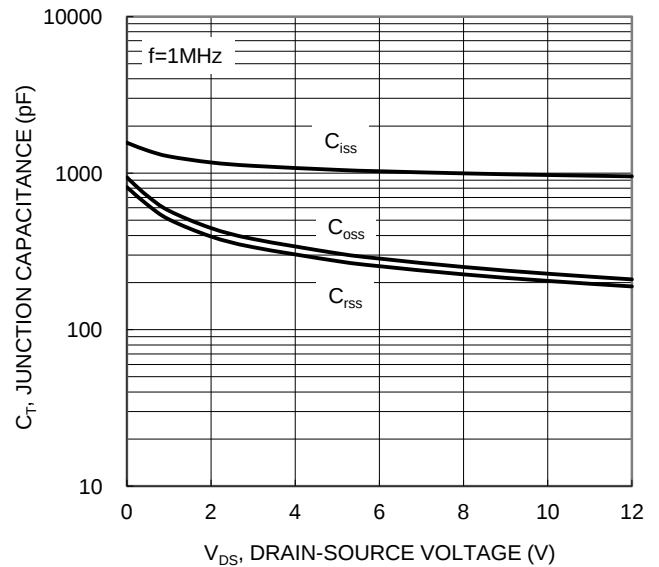
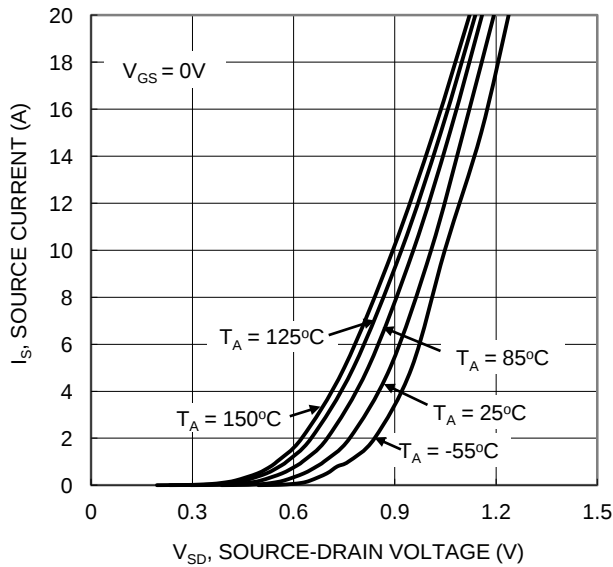
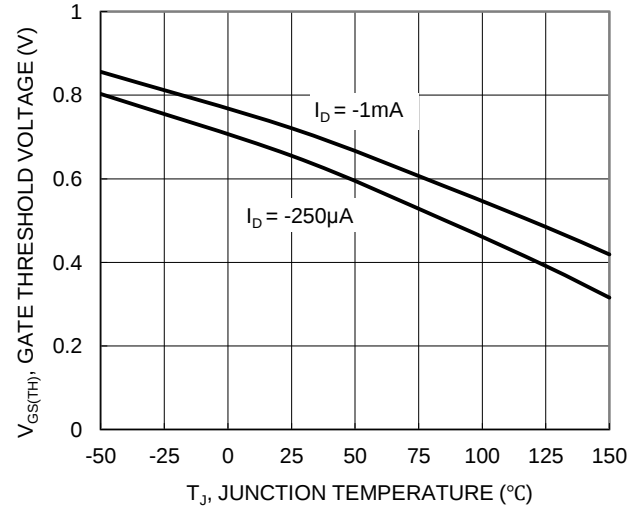
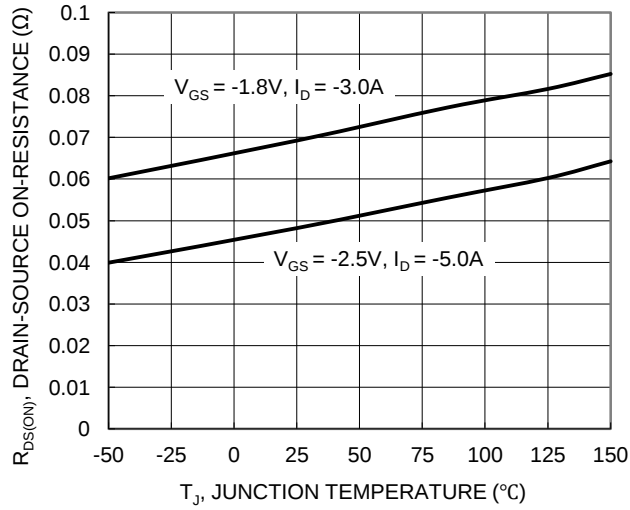


Figure 6. On-Resistance Variation with Temperature



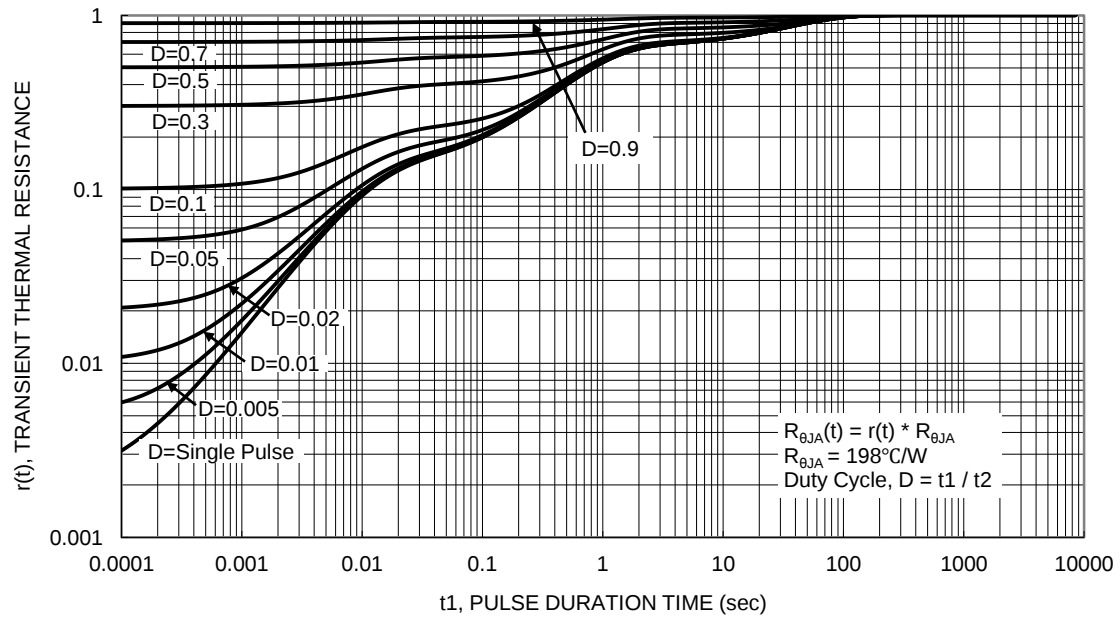
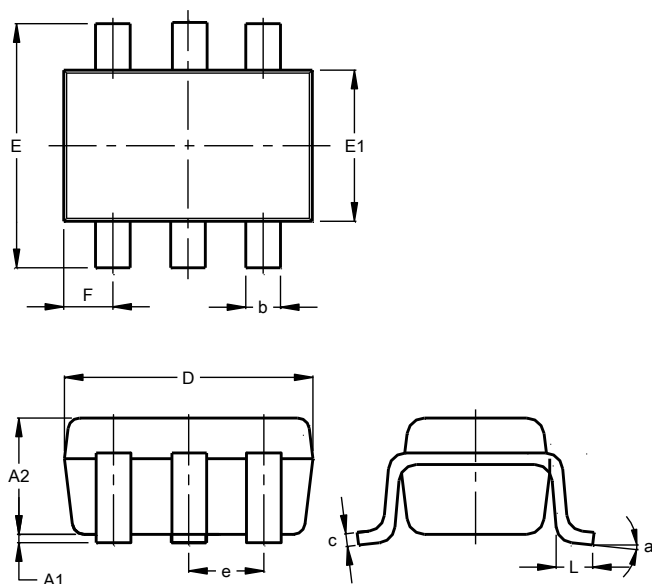


Figure 13. Transient Thermal Resistance

Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

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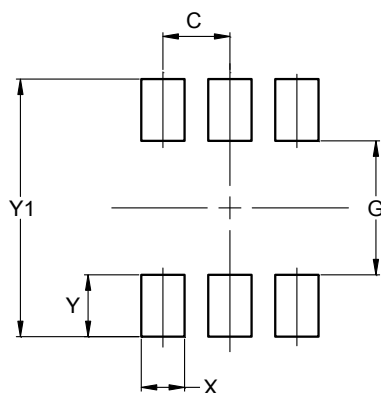


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Dim	Min	Max	Typ
A1	0.00	0.10	0.05
A2	0.90	1.00	1.00
b	0.10	0.30	0.25
c	0.10	0.22	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
F	0.40	0.45	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

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Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.420
Y	0.600
Y1	2.500

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