

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on) \max}$	$I_D$ $T_A = +25^\circ\text{C}$
-30V	50m $\Omega$ @ $V_{GS} = -10\text{V}$	-3.7A
	60m $\Omega$ @ $V_{GS} = -4.5\text{V}$	-3.3A
	85m $\Omega$ @ $V_{GS} = -2.5\text{V}$	-2.7A

## Features

- Low Input Capacitance
- Low On-Resistance
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DMG3401LSNQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**  
<https://www.diodes.com/quality/product-definitions/>

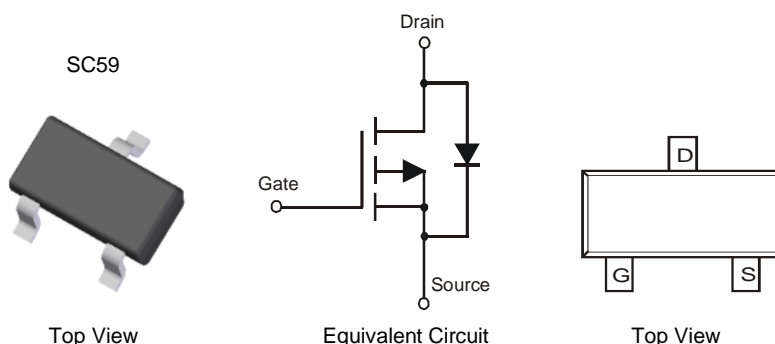
## Description and Applications

This new-generation small-signal enhancement-mode MOSFET features low on-resistance and fast switching, making it ideal for high-efficiency power management applications.

- Motor control
- Backlighting
- DC-DC converters
- Power management functions

## Mechanical Data

- Package: SC59
- Package Material - Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Finish - Matte Tin Annealed over Copper Leadframe Solderable per MIL-STD-202, Method 208
- Weight: 0.014 grams (Approximate)

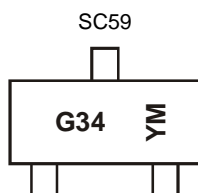


## Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Quantity	Carrier
DMG3401LSNQ-7	SC59	3,000	Tape & Reel
DMG3401LSNQ-13	SC59	10,000	Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information



G34 = Product Type Marking Code  
 YM or YM = Date Code Marking  
 Y or Y = Year (ex: Y = 2011)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2011	.....	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Code	Y	.....	L	M	N	P	R	S	T	U	V	W

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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Units
Drain-Source Voltage			V <sub>DSS</sub>	-30	V
Gate-Source Voltage			V <sub>GSS</sub>	±12	V
Continuous Drain Current (Note 5) V <sub>GS</sub> = -10V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	-3.0	A
		T <sub>A</sub> = +70°C		-2.3	
Continuous Drain Current (Note 6) V <sub>GS</sub> = -10V	Steady State	T <sub>A</sub> = +25°C	I <sub>D</sub>	-3.7	A
		T <sub>A</sub> = +70°C		-2.9	
Pulsed Drain Current (10μs pulse, duty cycle = 1%)			I <sub>DM</sub>	-30	A
Maximum Body Diode Continuous Current (Note 6)			I <sub>S</sub>	-1.5	A

**Thermal Characteristics**

Characteristic		Symbol	Value	Units
Total Power Dissipation	(Note 5)	P <sub>D</sub>	0.8	W
	(Note 6)		1.2	
Thermal Resistance, Junction to Ambient	(Note 5)	R <sub>θJA</sub>	159	°C/W
	(Note 6)		105	
Thermal Resistance, Junction to Case	(Note 6)	R <sub>θJC</sub>	36	
Operating and Storage Temperature Range		T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 7)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-30	-	-	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA
Zero Gate Voltage Drain Current T <sub>J</sub> = +25°C	I <sub>DSS</sub>	-	-	-1.0	μA	V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V
Gate-Body Leakage	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 7)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	-0.5	-1.0	-1.3	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	-	41	50	mΩ	V <sub>GS</sub> = -10V, I <sub>D</sub> = -4A
		-	47	60		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.5A
		-	60	85		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -2.5A
Forward Transfer Admittance	Y <sub>fs</sub>	-	12	-	S	V <sub>DS</sub> = -5V, I <sub>D</sub> = -4A
Diode Forward Voltage	V <sub>SD</sub>	-	-0.8	-1.0	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	-	1,326	-	pF	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	-	103	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	71	-		
Gate Resistance	R <sub>g</sub>	-	7.3	-	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
Total Gate Charge (V <sub>GS</sub> = -4.5V)	Q <sub>g</sub>	-	11.6	-	nC	V <sub>DD</sub> = -15V, I <sub>D</sub> = -4A
Total Gate Charge (V <sub>GS</sub> = -10V)	Q <sub>g</sub>	-	25.1	-		
Gate-Source Charge	Q <sub>gs</sub>	-	2	-		
Gate-Drain Charge	Q <sub>gd</sub>	-	1.7	-		
Turn-On Delay Time	t <sub>D(on)</sub>	-	8	-	nS	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -10V, R <sub>GEN</sub> = 6Ω, R <sub>L</sub> = 3.75Ω
Turn-On Rise Time	t <sub>r</sub>	-	13	-		
Turn-Off Delay Time	t <sub>D(off)</sub>	-	71	-		
Turn-Off Fall Time	t <sub>f</sub>	-	38	-		

- 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 1-inch square copper pad layout
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.

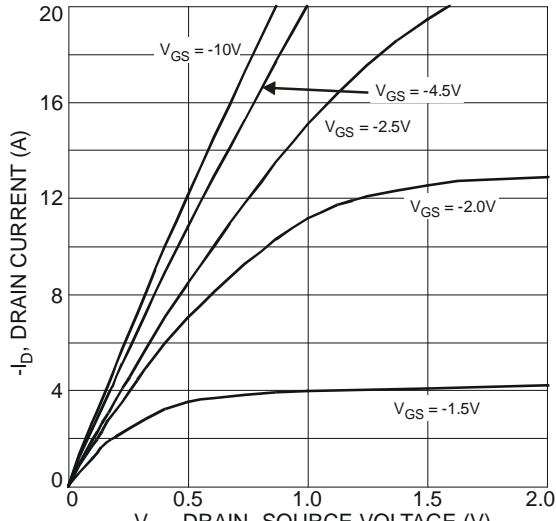


Figure 1 Typical Output Characteristics

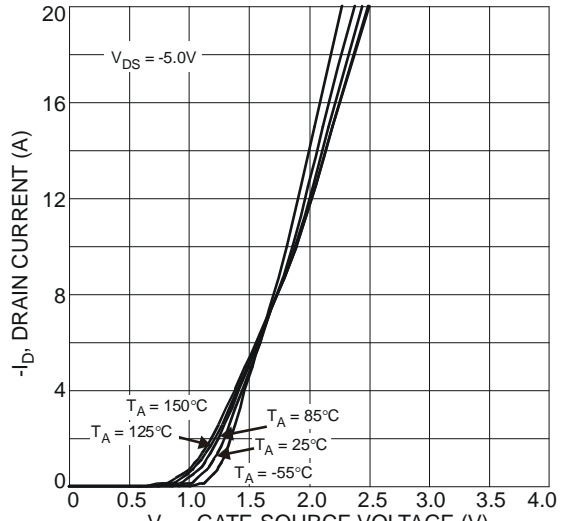


Figure 2 Typical Transfer Characteristics

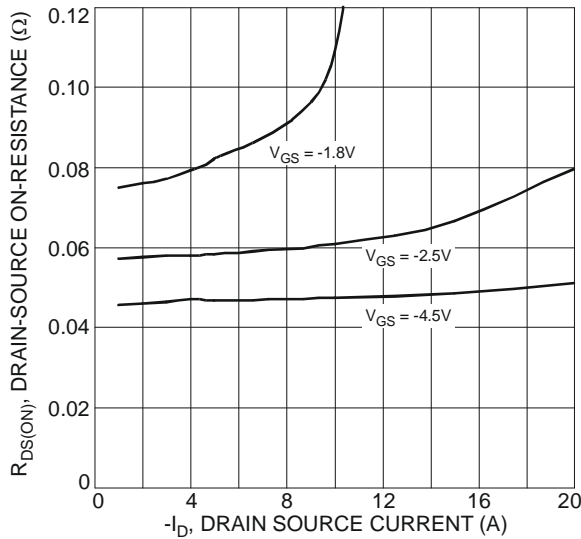


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

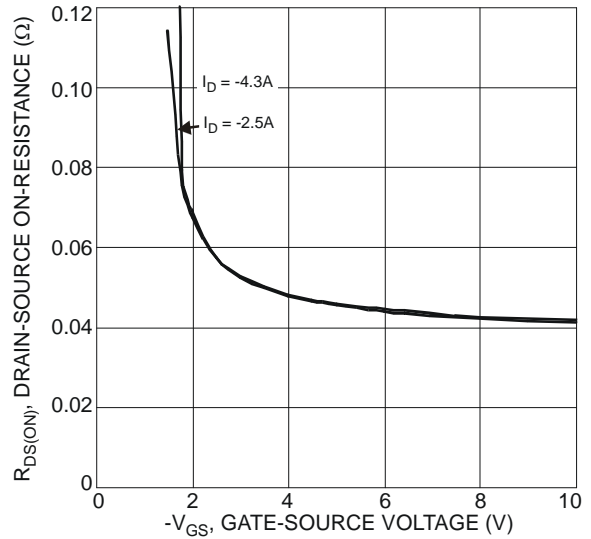


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

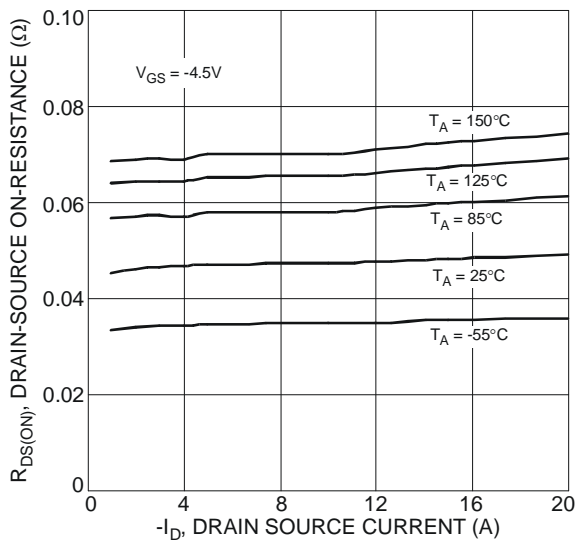


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

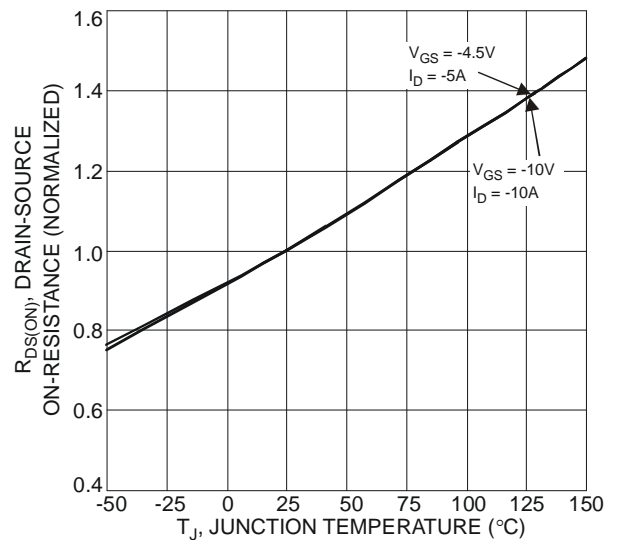


Figure 6 On-Resistance Variation with Temperature

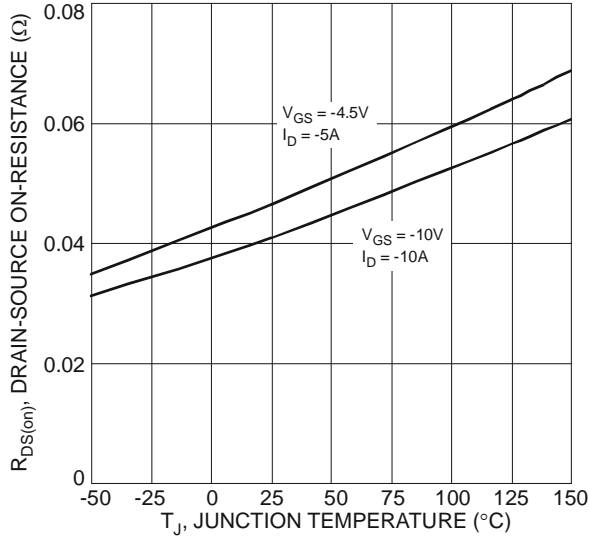


Figure 7 On-Resistance Variation with Temperature

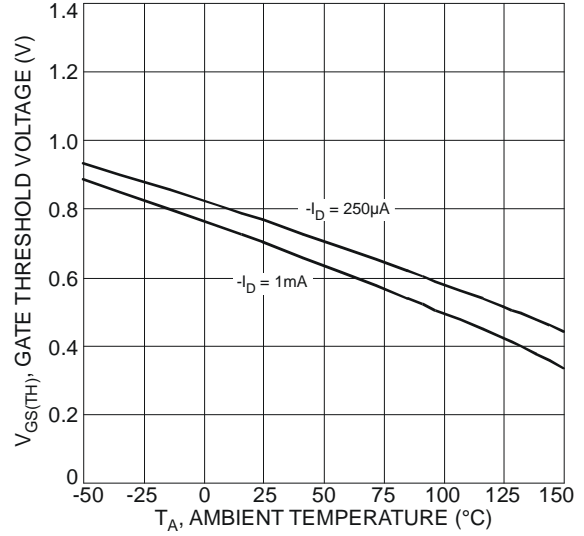


Figure 8 Gate Threshold Variation vs. Ambient Temperature

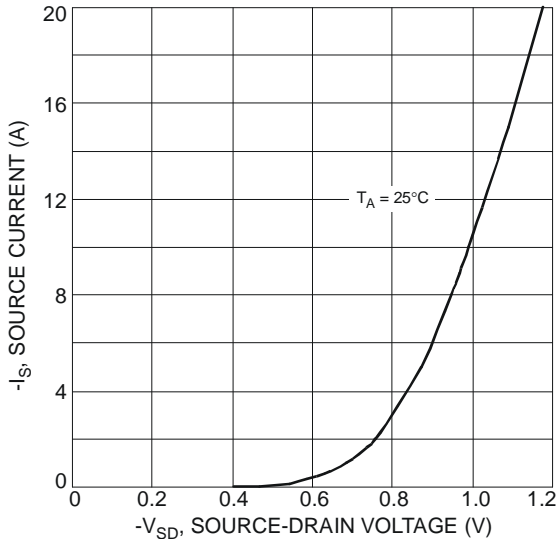


Figure 9 Diode Forward Voltage vs. Current

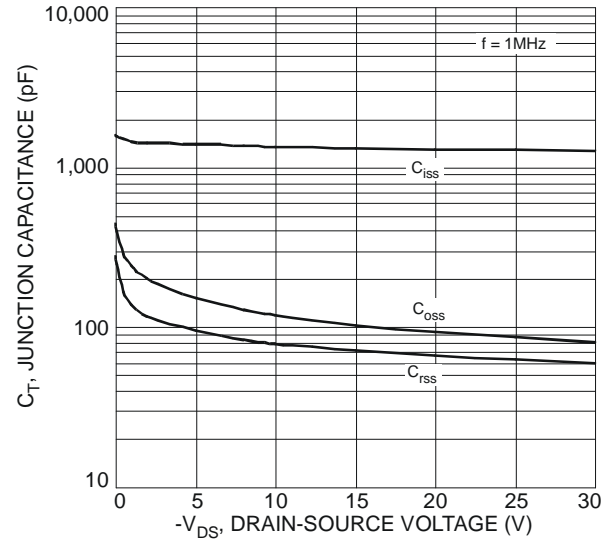


Figure 10 Typical Junction Capacitance

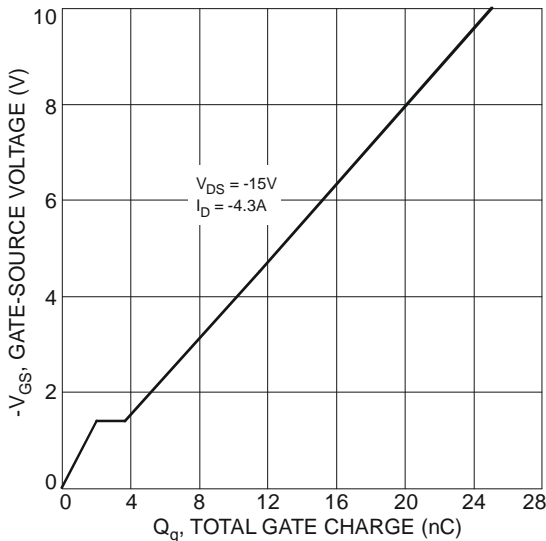


Figure 11 Gate-Charge Characteristics

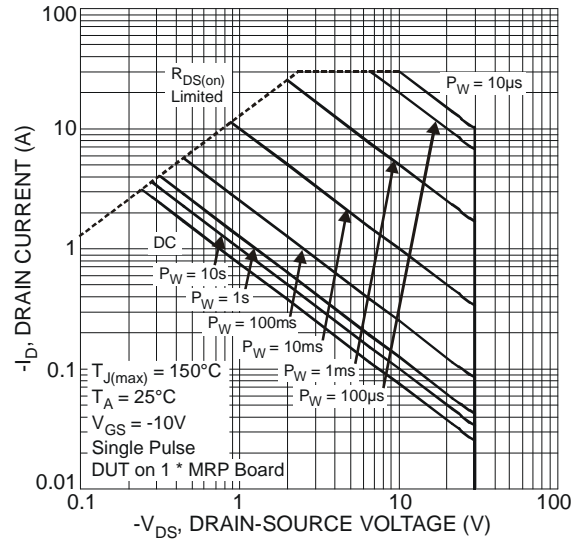
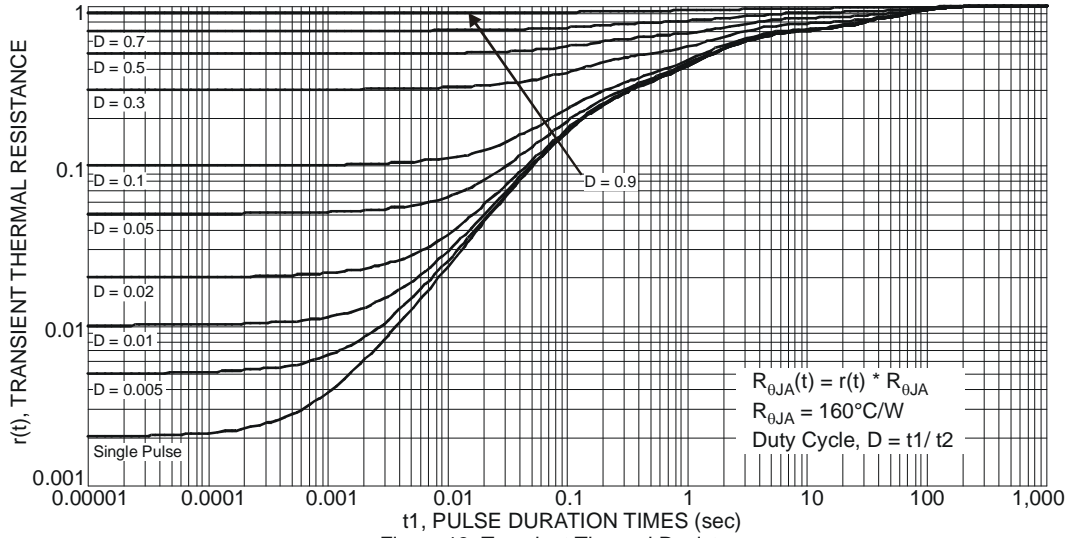


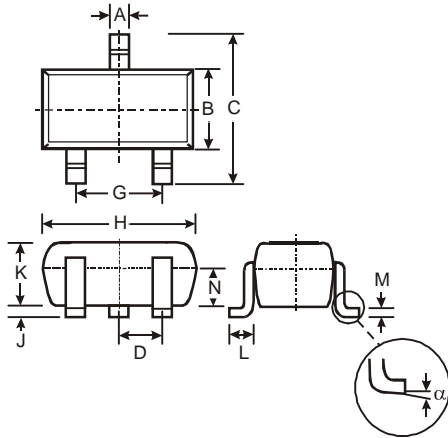
Figure 12 SOA, Safe Operation Area



## Package Outline Dimensions

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

### SC59

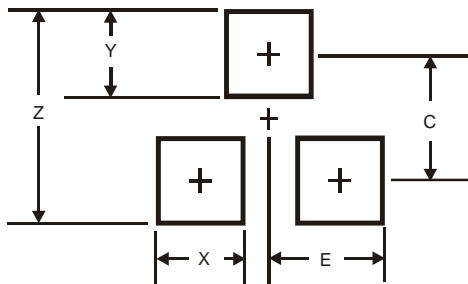


SC59			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	-	-	0.95
G	-	-	1.90
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
N	0.70	0.80	0.75
α	0°	8°	-
All Dimensions in mm			

## Suggested Pad Layout

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

### SC59



Dimensions	SC59
Z	3.4
X	0.8
Y	1.0
C	2.4
E	1.35

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