

N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(ON)}$ max	I_D max $T_A = +25^\circ C$
30V	28mΩ @ $V_{GS} = 10V$	5.8A
	42mΩ @ $V_{GS} = 4.5V$	4.8A
	82mΩ @ $V_{GS} = 3V$	2.0A

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

- Battery Charging
- Power Management Functions
- DC-DC Converters
- Portable Power Adaptors

Features and Benefits

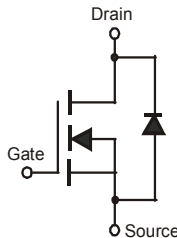
- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **Totally Lead-Free & Fully RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

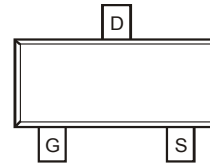
- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish — Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Terminals Connections: See Diagram Below
- Weight: 0.008 grams (approximate)



Top View



Internal Schematic



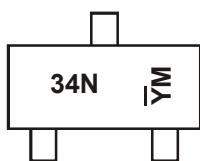
Top View

Ordering Information (Note 4 & 5)

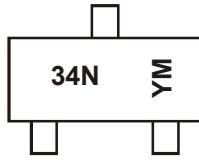
Part Number	Compliance	Case	Packaging
DMN3404L-7	Standard	SOT23	3000/Tape & Reel
DMN3404LQ-7	Automotive	SOT23	3000/Tape & Reel

- 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/quality/product_compliance_definitions/.
 5. For packaging details, go to Diodes website at <http://www.diodes.com/products/packages.html>.

Marking Information



Chengdu A/T Site



Shanghai A/T Site

34N = Product Type Marking Code
 YM = Date Code Marking for SAT (Shanghai Assembly/ Test site)
 $\bar{Y}\bar{M}$ = Date Code Marking for CAT (Chengdu Assembly/ Test site)
 Y or \bar{Y} = Year (ex: A = 2013)
 M = Month (ex: 9 = September)

Date Code Key

Year	2009	2010	2011	2012	2013	2014	2015
Code	W	X	Y	Z	A	B	C

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 (Note 6 & 7)		V _{DS}	30	V
Gate-Source Voltage		V _{GSS}	±20	V
Continuous Drain Current (Note 6) V _{GS} = 10V	Steady State	T _A = -40°C	4.6	A
		T _A = +25°C	4.2	
		T _A = +85°C	3.0	
Continuous Drain Current (Note 7) V _{GS} = 10V	Steady State	T _A = -40°C	6.2	A
		T _A = +25°C	5.8	
		T _A = +85°C	4.0	
Continuous Drain Current (Note 7) V _{GS} = 4.5V	Steady State	T _A = -40°C	5.2	A
		T _A = +25°C	4.8	
		T _A = +85°C	3.2	
Continuous Drain Current (Note 7) V _{GS} = 3V	Steady State	T _A = -40°C	2.2	A
		T _A = +25°C	2.0	
		T _A = +85°C	1.0	
Pulsed Drain Current		I _{DM}	30	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P _D	0.72	W
Thermal Resistance, Junction to Ambient @T _A = +25°C	R _{θJA}	173	°C/W
Power Dissipation (Note 7)	P _D	1.4	W
Thermal Resistance, Junction to Ambient @T _A = +25°C	R _{θJA}	90	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Notes: 6. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
7. Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate.

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	30	—	—	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	—	—	1.0	μA	V _{DS} = 30V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(th)}	1.0	1.5	2.0	V	V _{DS} = V _{GS} , I _D = 250μA
Static Drain-Source On-Resistance T _J = -40°C (Note 9)	R _{DS(ON)}	—	23	27	—	V _{GS} = 4.5V, I _D = 4.8A
		—	57	74	—	V _{GS} =3V, I _D =2A
Static Drain-Source On-Resistance T _J = +25°C	R _{DS(ON)}	—	24	28	mΩ	V _{GS} = 10V, I _D = 5.8A
		—	33	42		V _{GS} = 4.5V, I _D = 4.8A
		—	63	82	V _{GS} =3V, I _D =2A	
		—	71	95	mΩ	V _{GS} =3V, I _D =2A
Static Drain-Source On-Resistance T _J = +85°C (Note 9)	R _{DS(ON)}	—	71	95	mΩ	V _{GS} =3V, I _D =2A
Forward Transfer Admittance	Y _{fs}	—	10	—	S	V _{DS} = 5V, I _D = 5.8A
Diode Forward Voltage	V _{SD}	—	0.75	1.0	V	V _{GS} = 0V, I _S = 1A
DYNAMIC CHARACTERISTICS (Note 10)						
Input Capacitance	C _{iss}	—	498	—	pF	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	52	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	45	—	pF	
Gate Resistance	R _g	—	1.75	2.8	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = 3V)	Q _g	—	3.8	5.3	nC	V _{GS} = 3V, V _{DS} = 15V, I _D = 1A
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	5.3	7.5	nC	V _{GS} = 10V/4.5V, V _{DS} = 15V, I _D = 5.8A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	11.3	16	nC	
Gate-Source Charge	Q _{gs}	—	1.4	—	nC	
Gate-Drain Charge	Q _{gd}	—	2.1	—	nC	
Turn-On Delay Time	t _{D(on)}	—	3.41	10	ns	V _{DD} = 15V, V _{GS} = 10V, R _L = 2.6Ω, R _G = 3Ω
Turn-On Rise Time	t _r	—	6.18	13	ns	
Turn-Off Delay Time	t _{D(off)}	—	13.92	28	ns	
Turn-Off Fall Time	t _f	—	2.84	10	ns	

Notes: 8. Short duration pulse test used to minimize self-heating effect.
 9. Guaranteed by design and 25°C data. Not subject to production testing
 10. Guaranteed by design. Not subject to production testing.

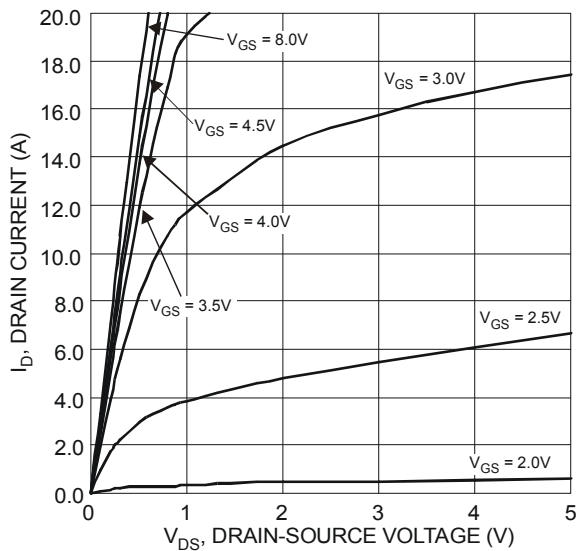


Figure 1 Typical Output Characteristics

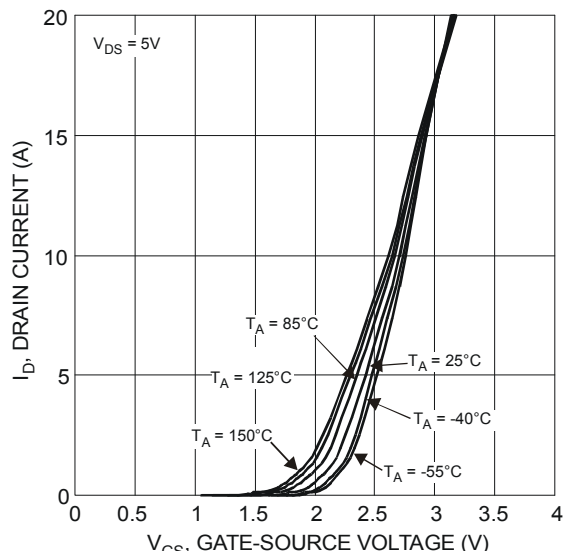


Figure 2 Typical Transfer Characteristics

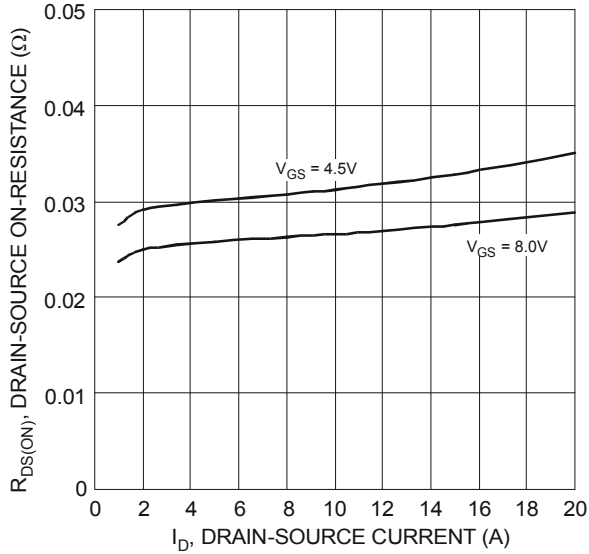


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

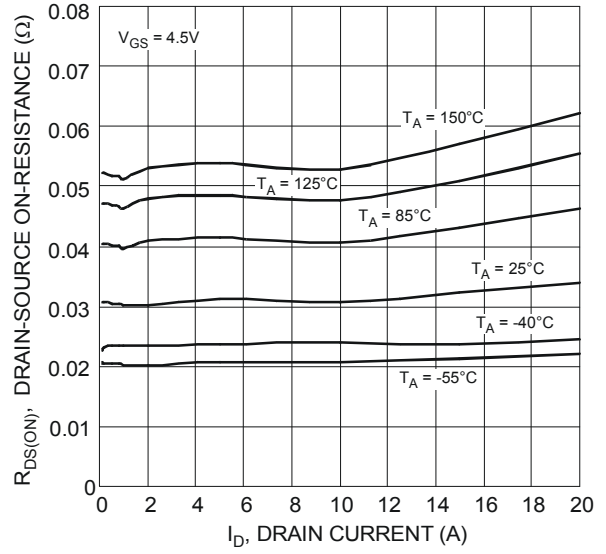


Figure 4 Typical On-Resistance vs. Drain Current and Temperature

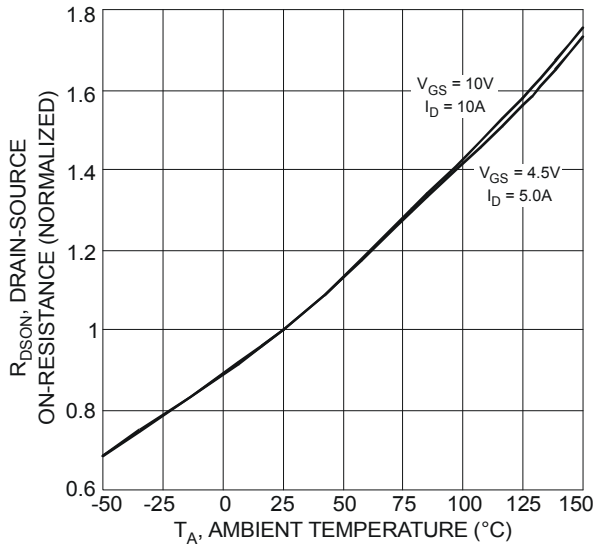


Figure 5 On-Resistance Variation with Temperature

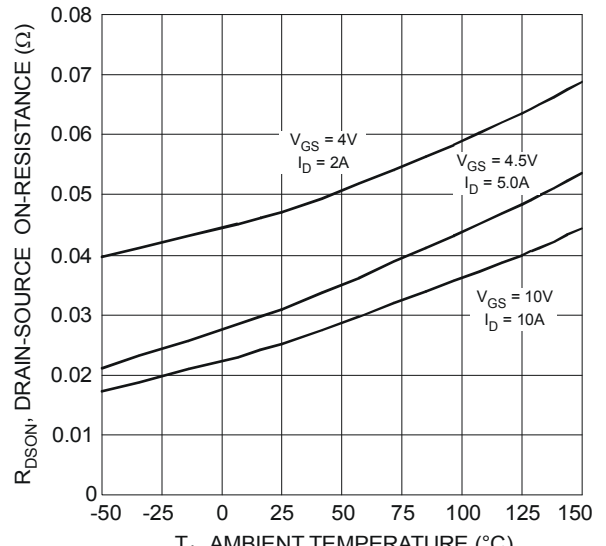


Figure 6 On-Resistance Variation with Temperature

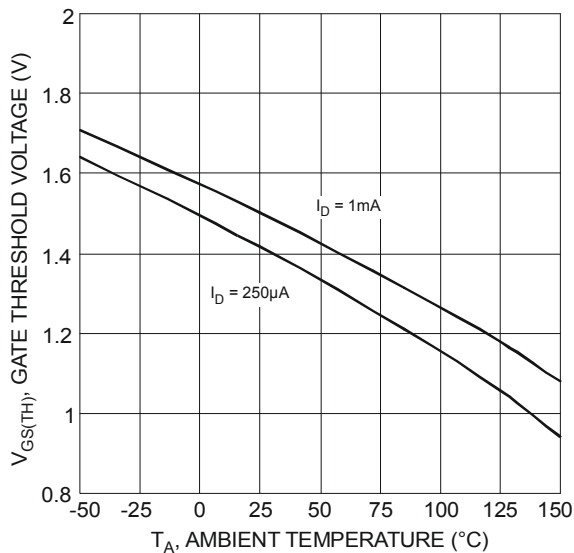


Figure 7 Gate Threshold Variation vs. Ambient Temperature

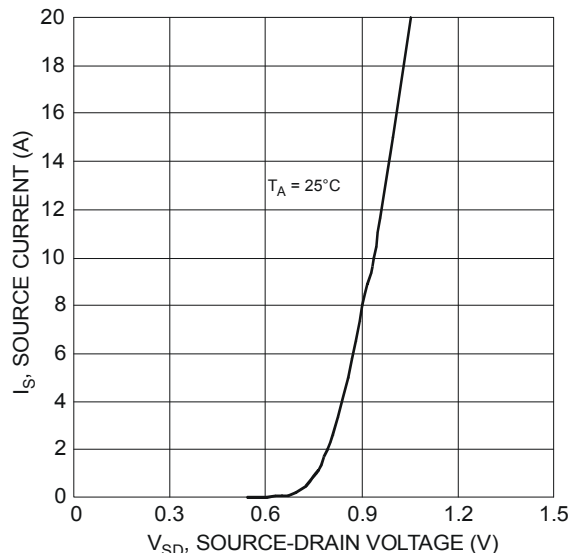
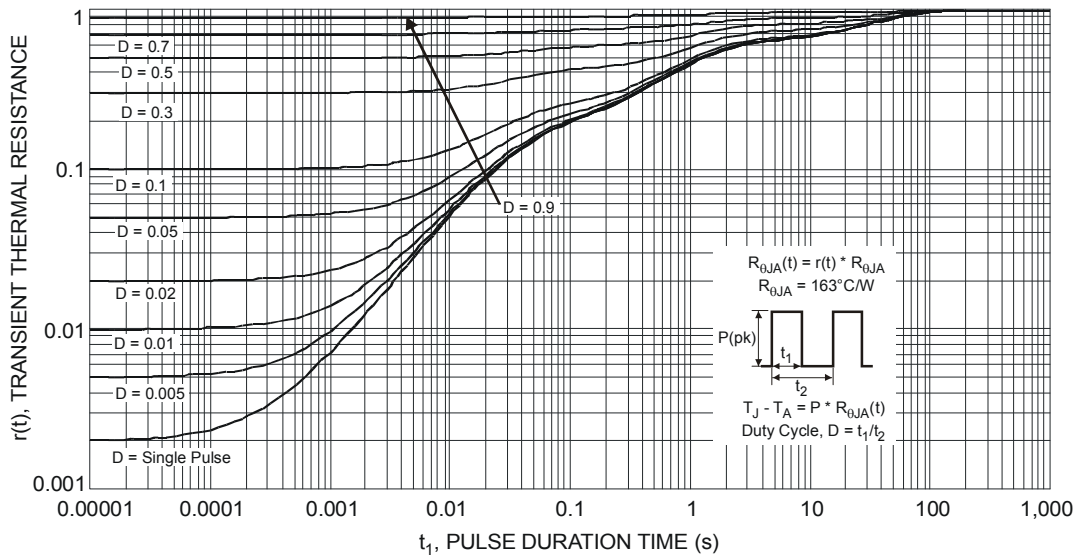
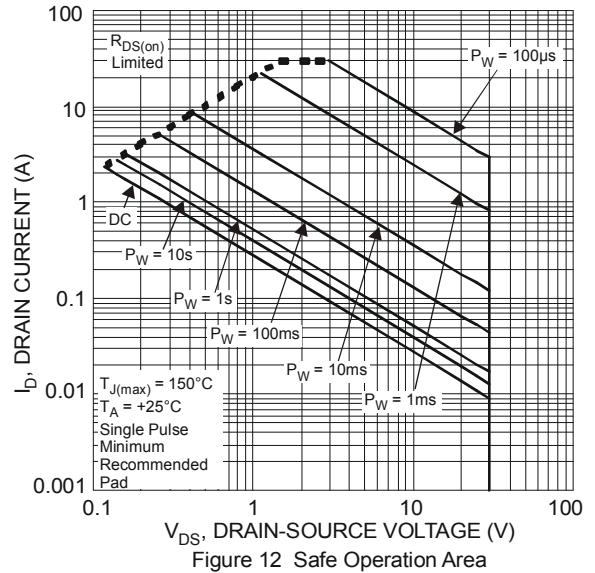
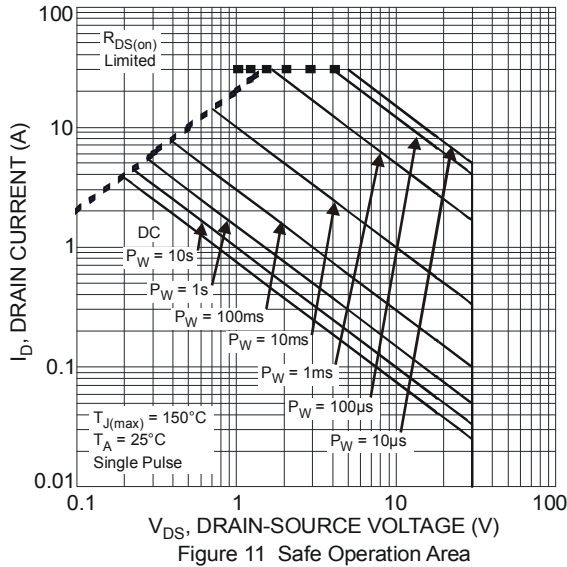
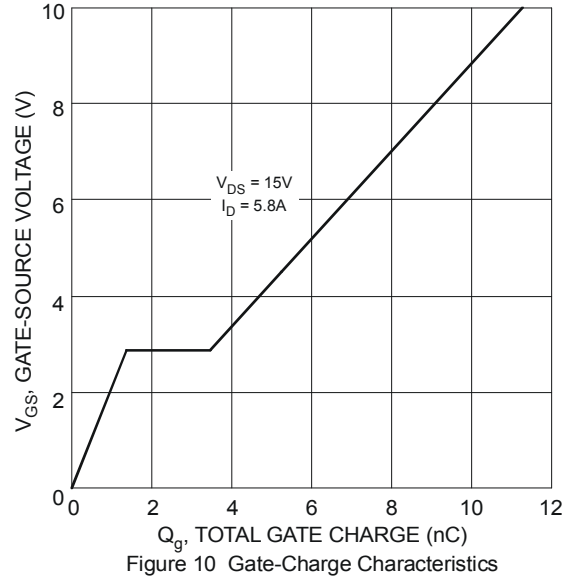
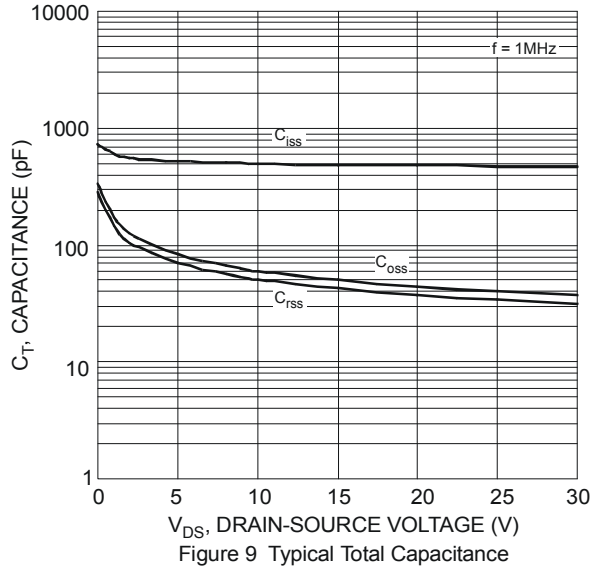
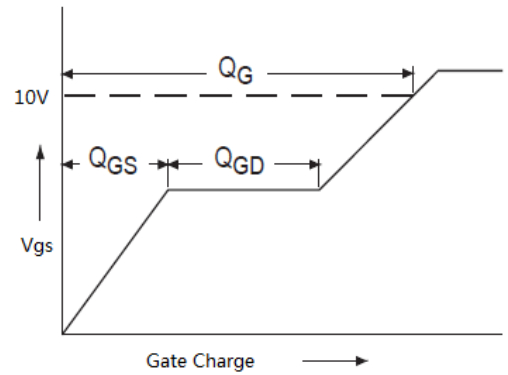
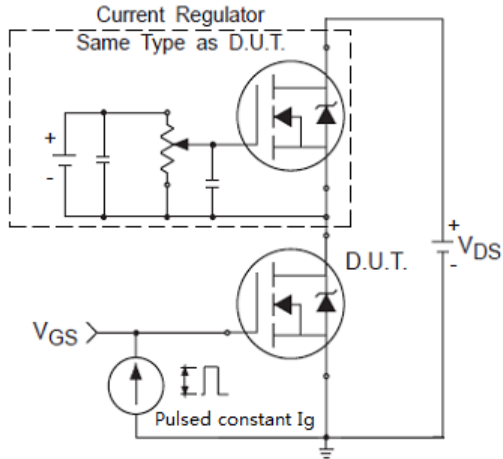


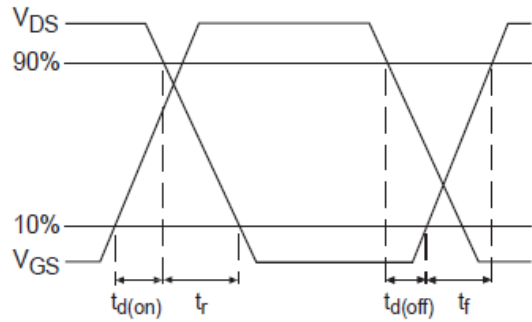
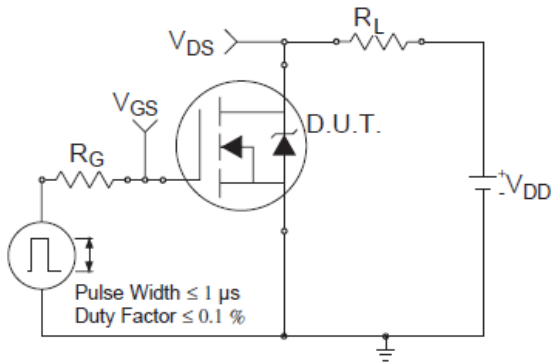
Figure 8 Diode Forward Voltage vs. Current



Gate Charge Test Circuit and Waveform

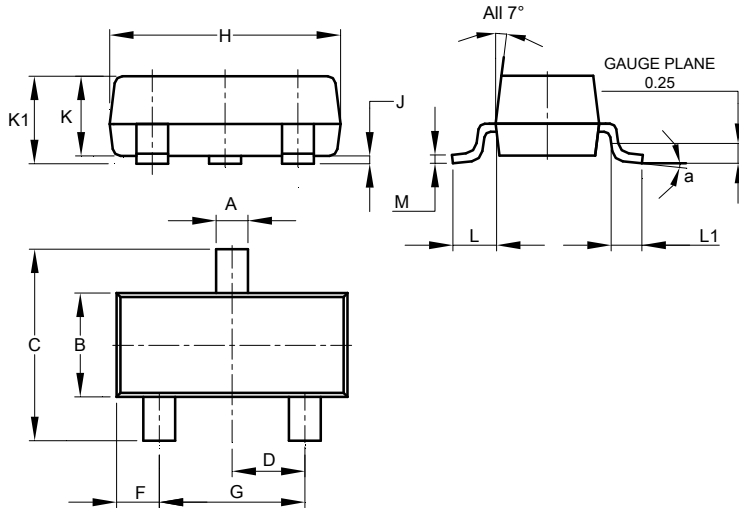


Switching Test Circuit and Waveform



Package Outline Dimensions

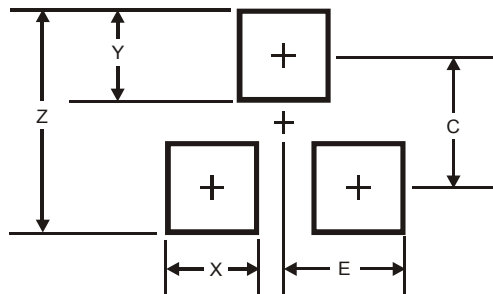
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
α	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)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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