DMN4025LSD

40V DUAL N-CHANNEL ENHANCEMENT MODE MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$ max	I_D max (A) T_A = 25°C (Notes 3 & 5)
40V	25mΩ @ V_{GS}= 10V	7.4
	40mΩ @ V_{GS}= 4.5V	6.2

Description and Applications

This MOSFET has been designed to minimize the on-state resistance and yet maintain superior switching performance, making it ideal for high efficiency power management applications.

- Motor control
- Backlighting
- DC-DC Converters
- Printer equipment

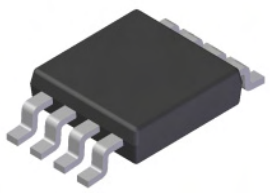
Features and Benefits

- Low $R_{DS(on)}$ – Minimizes conduction losses
- Fast switching speed – Minimizes switching losses
- **"Green" component and RoHS compliant (Note 1)**
- **Qualified to AEC-Q101 Standards for High Reliability**

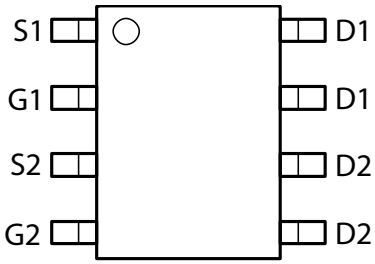
Mechanical Data

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

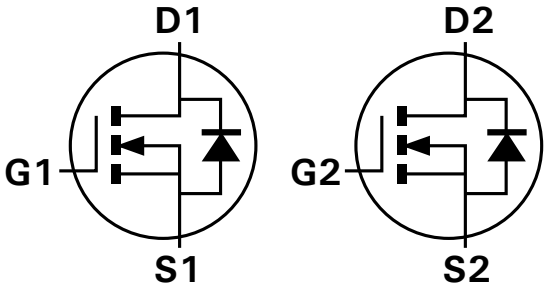
SO-8



Top View



Pin-Out Top View



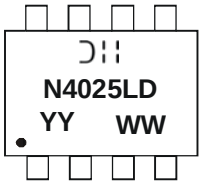
Device symbol

Ordering Information (Note 1)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
DMN4025LSD-13	N4025LD	13	12	2,500

Note: 1. Diodes, Inc. defines "Green" products as those which are RoHS compliant and contain no halogens or antimony compounds; further information about Diodes Inc.'s "Green" Policy can be found on our website. For packaging details, go to our website.

Marking Information



= Manufacturer's Marking
N4025LD = Product Type Marking Code
YYWW = Date Code Marking
YY = Year (ex: 10 = 2010)
WW = Week (01 - 53)

Maximum Ratings @T_A = 25°C unless otherwise specified

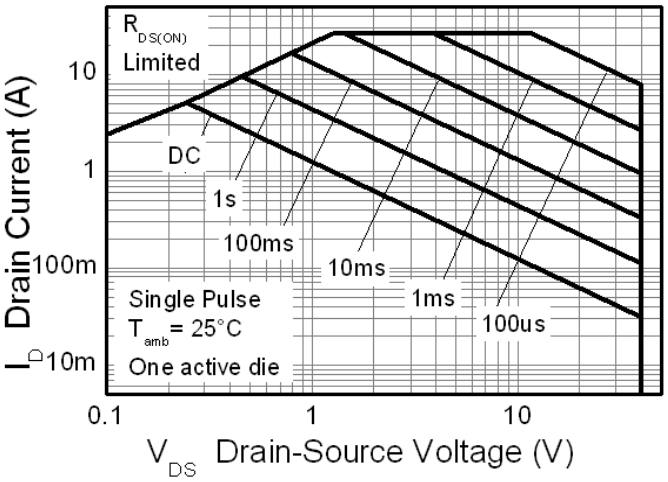
Characteristic			Symbol	Value	Units
Drain-Source Voltage			V_{DSS}	40	V
Gate-Source Voltage			V_{GSS}	±20	
Continuous Drain Current	V_{GS} = 10V	(Notes 3 & 5)	I_D	7.4	A
		T_A = 70°C (Notes 3 & 5)		5.8	
		(Notes 2 & 5)		5.6	
		(Notes 2 & 6)		6.7	
Pulsed Drain Current	V_{GS} = 10V	(Notes 4 & 5)	I_{DM}	29.0	
Continuous Source Current (Body diode)		(Notes 3 & 5)	I_S	3.0	
Pulsed Source Current (Body diode)		(Notes 4 & 5)	I_{SM}	29.0	

Thermal Characteristics @T_A = 25°C unless otherwise specified

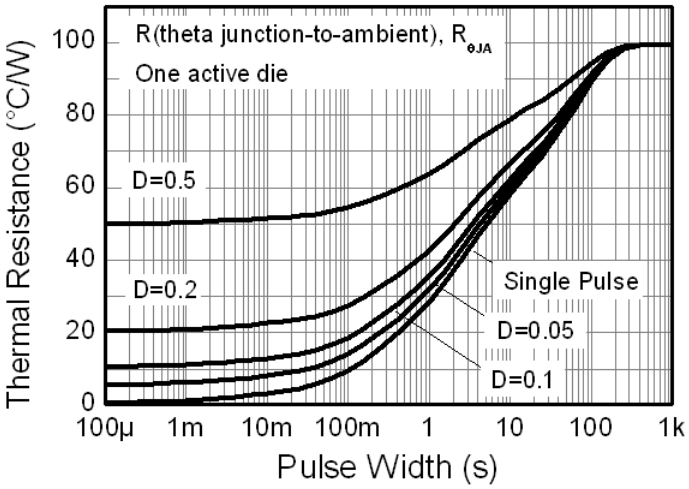
Characteristic		Symbol	Value	Unit
Power Dissipation Linear Derating Factor	(Notes 2 & 5)	P_D	1.25 10	W mW/°C
	(Notes 2 & 6)		1.8 14.3	
	(Notes 3 & 5)		2.14 17.2	
Thermal Resistance, Junction to Ambient	(Notes 2 & 5)	$R_{\theta JA}$	100	°C/W
	(Notes 2 & 6)		70	
	(Notes 3 & 5)		58	
Thermal Resistance, Junction to Lead	(Notes 5 & 7)	$R_{\theta JL}$	51	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Notes:
2. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.
3. Same as note (2), except the device is measured at t ≤ 10 sec.
4. Same as note (2), except the device is pulsed with D = 0.02 and pulse width 300µs.
5. For a dual device with one active die.
6. For a device with two active die running at equal power.
7. Thermal resistance from junction to solder-point (at the end of the drain lead).

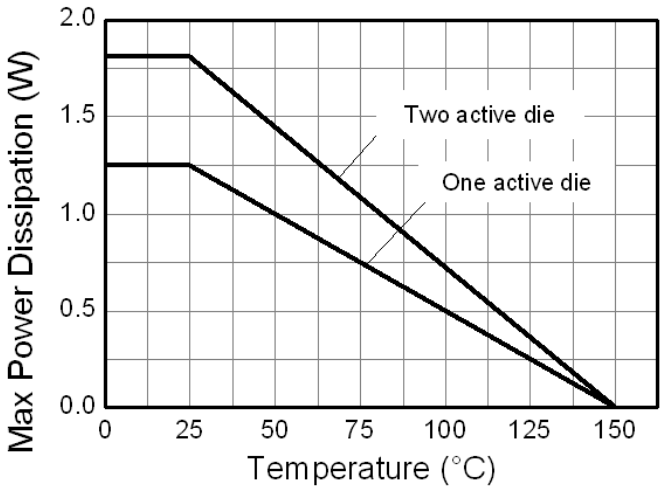
Thermal Characteristics



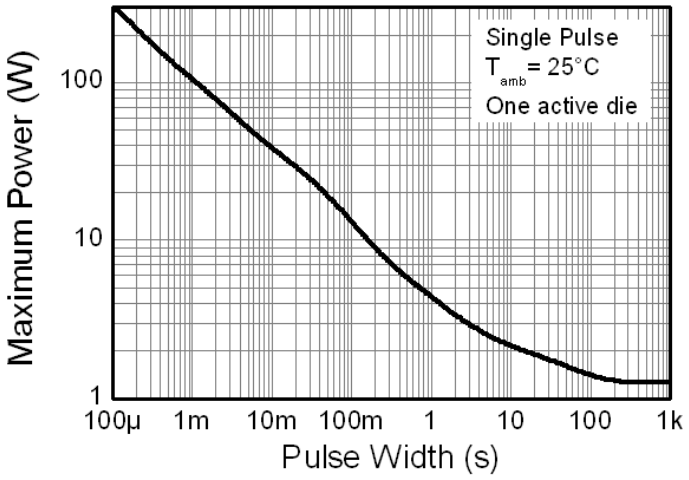
N-channel Safe Operating Area



Transient Thermal Impedance



Derating Curve



Pulse Power Dissipation

Electrical Characteristics T_A = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	40	—	—	V	I_D = 250μA, V_{GS} = 0V
Zero Gate Voltage Drain Current	I_{DSS}	—	—	1.0	μA	V_{DS} = 40V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±100	nA	V_{GS} = ±20V, V_{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(th)}$	0.8	1.3	1.8	V	I_D = 250μA, V_{DS} = V_{GS}
Static Drain-Source On-Resistance (Note 8)	$R_{DS\ (ON)}$	—	0.013	0.025	Ω	V_{GS} = 10V, I_D = 3A
			0.028	0.040		V_{GS} = 4.5V, I_D = 3A
Forward Transconductance (Notes 8 & 9)	g_{fs}	—	12.6	—	S	V_{DS} = 5V, I_D = 3A
Diode Forward Voltage (Note 8)	V_{SD}	—	0.7	1.0	V	I_S = 1A, V_{GS} = 0V
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	1790	—	pF	V_{DS} = 20V, V_{GS} = 0V f = 1MHz
Output Capacitance	C_{oss}	—	160	—		
Reverse Transfer Capacitance	C_{rss}	—	120	—		
Gate Resistance	R_g	—	1.03	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (Note 10)	Q_g	—	16.0	—	nC	V_{GS} = 4.5V; V_{DS} = 20V, I_D = 3A
Total Gate Charge (Note 10)	Q_g	—	37.6	—		V_{GS} = 10V; V_{DS} = 20V, I_D = 3A
Gate-Source Charge (Note 10)	Q_{gs}	—	7.8	—		
Gate-Drain Charge (Note 10)	Q_{gd}	—	6.6	—		
Turn-On Delay Time (Note 10)	$t_{D(on)}$	—	8.1	—	ns	V_{DD} = 20V, V_{GS} = 10V I_D = 3A
Turn-On Rise Time (Note 10)	t_r	—	15.1	—		
Turn-Off Delay Time (Note 10)	$t_{D(off)}$	—	24.3	—		
Turn-Off Fall Time (Note 10)	t_f	—	5.3	—		

Notes: 8. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%
9. For design aid only, not subject to production testing.
10. Switching characteristics are independent of operating junction temperatures.

Typical Characteristics

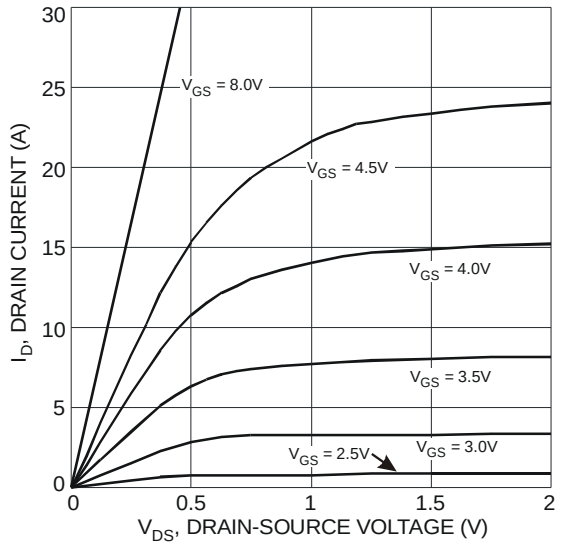


Fig. 1 Typical Output Characteristic

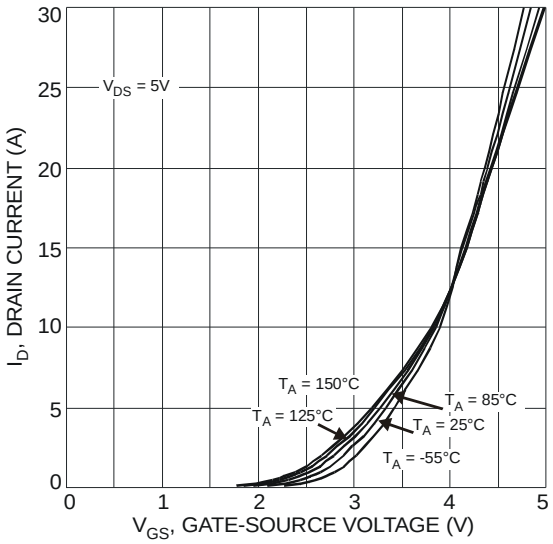


Fig. 2 Typical Transfer Characteristic

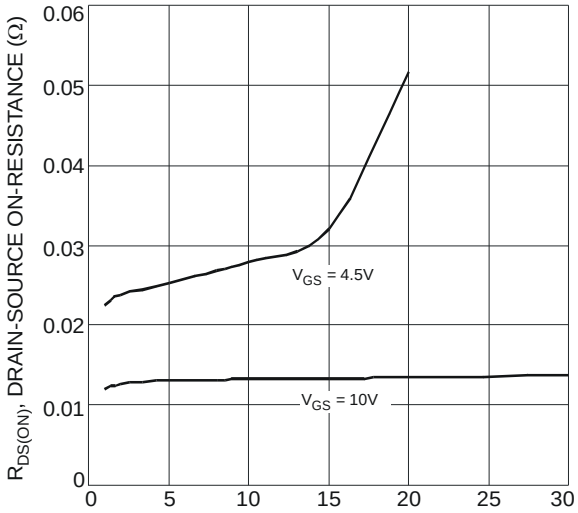


Fig. 3 Typical On-Resistance
vs. Drain Current and Gate Voltage

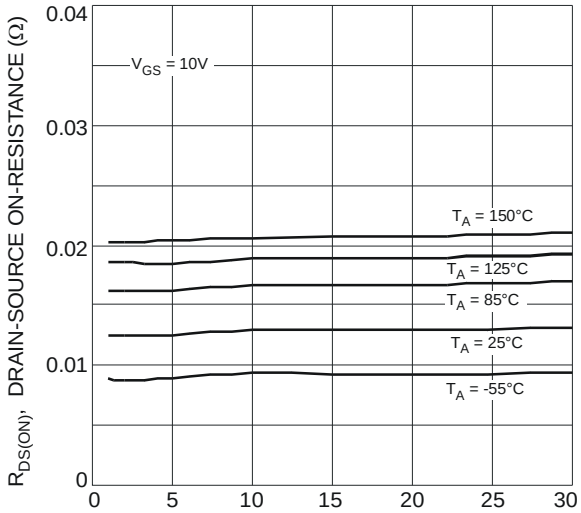


Fig. 4 Typical On-Resistance
vs. Drain Current and Temperature

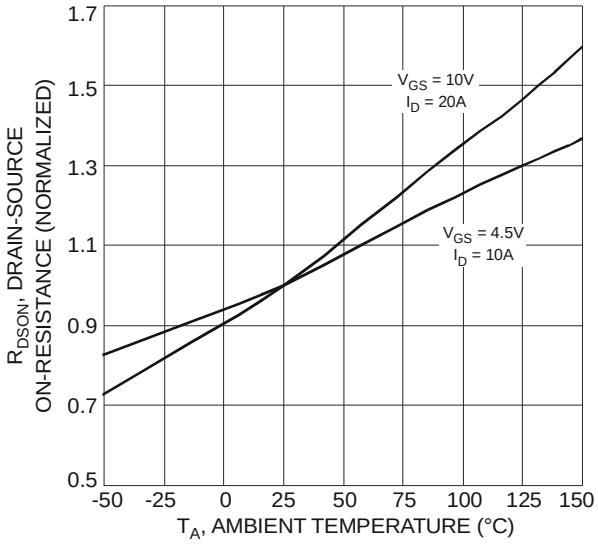


Fig. 5 On-Resistance Variation with Temperature

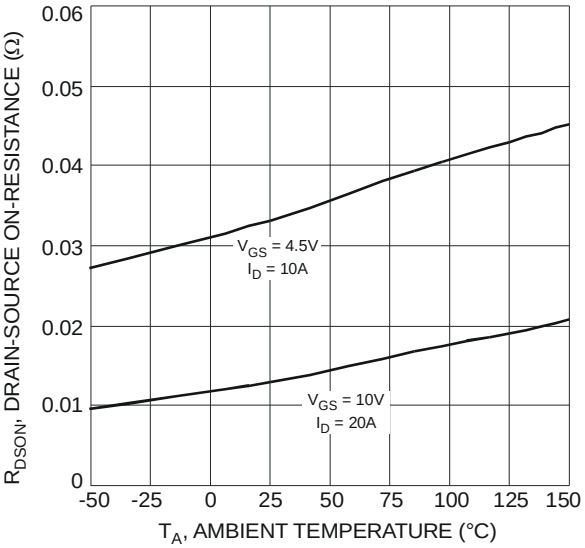


Fig. 6 On-Resistance Variation with Temperature

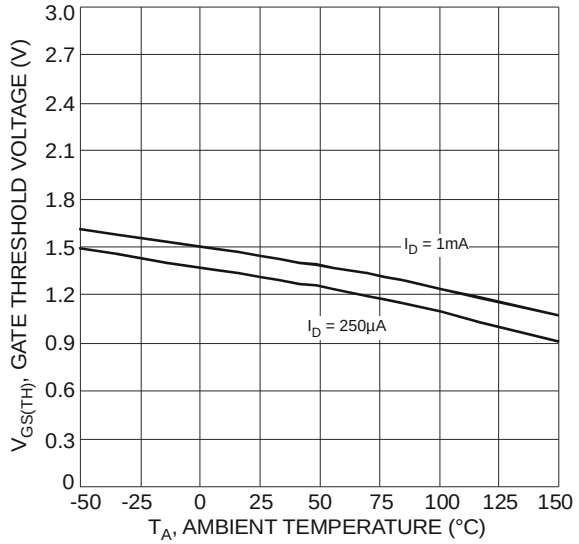


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

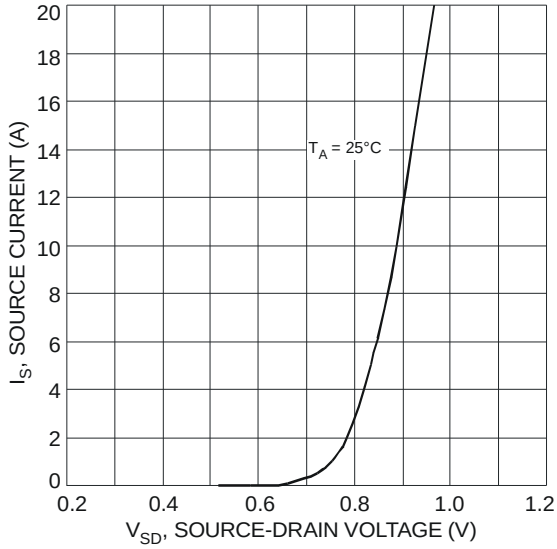


Fig. 8 Diode Forward Voltage vs. Current

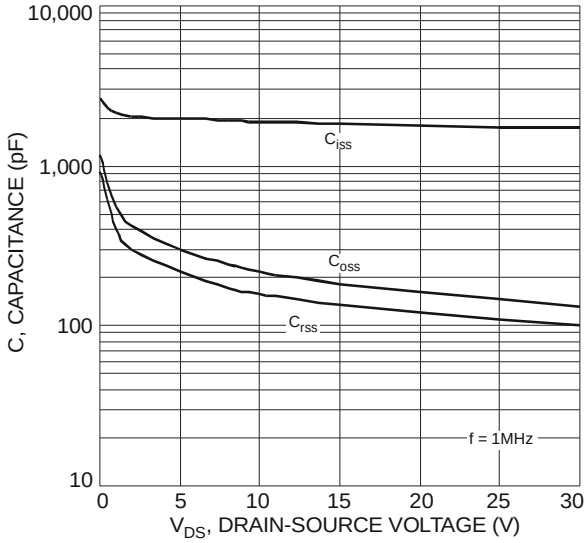


Fig. 9 Typical Total Capacitance

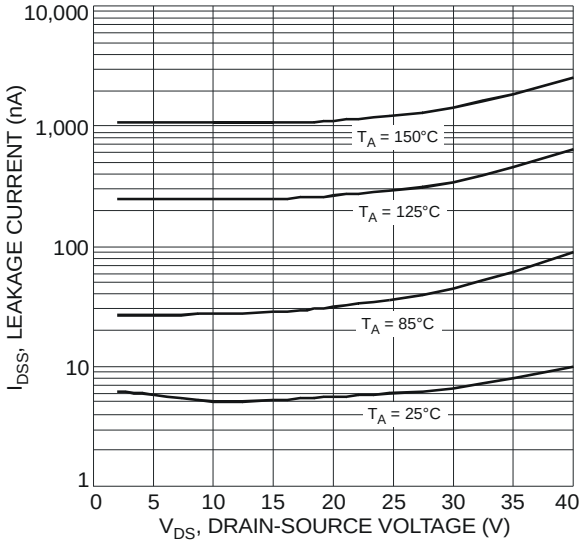


Fig. 10 Typical Leakage Current
vs. Drain-Source Voltage

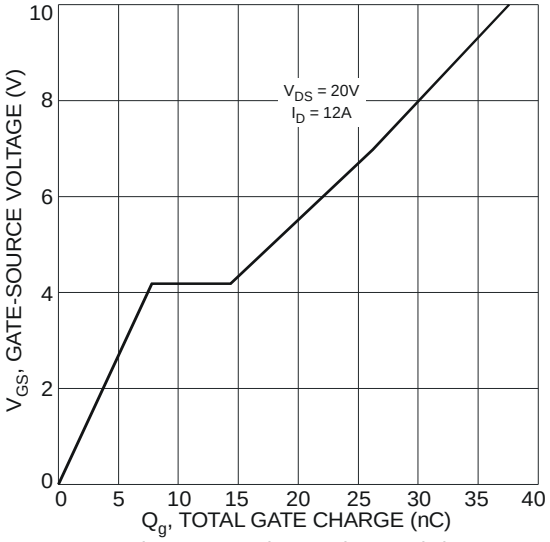
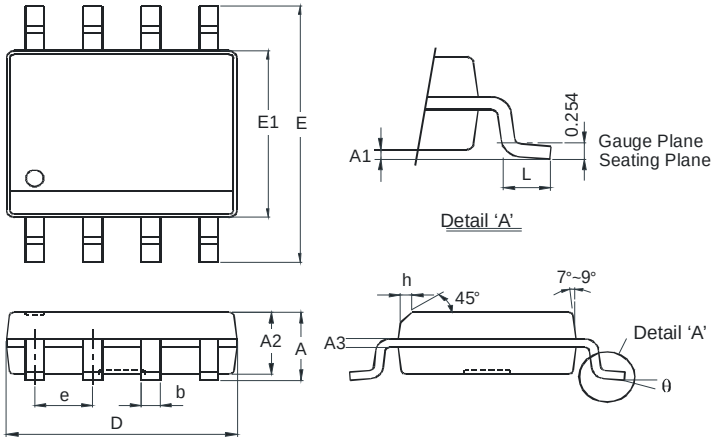


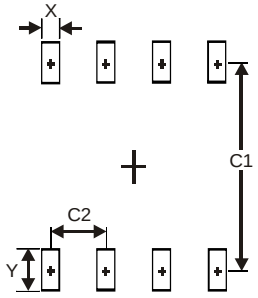
Fig. 11 Gate-Charge Characteristics

Package Outline Dimensions



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



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

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