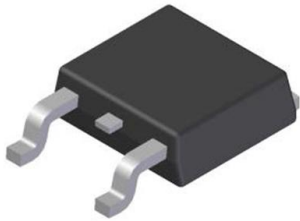


# ZXMP6A17KTC Datasheet

[www.digi-electronics.com](http://www.digi-electronics.com)



<https://www.DiGi-Electronics.com>

DiGi Electronics Part Number	ZXMP6A17KTC-DG
Manufacturer	<a href="#">Diodes Incorporated</a>
Manufacturer Product Number	ZXMP6A17KTC
Description	MOSFET P-CH 60V 4.4A TO252-3
Detailed Description	P-Channel 60 V 4.4A (Ta) 2.11W (Ta) Surface Mount TO-252-3



Tel: +00 852-30501935

RFQ Email: [Info@DiGi-Electronics.com](mailto:Info@DiGi-Electronics.com)

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## Purchase and inquiry

Manufacturer Product Number:

ZXMP6A17KTC

Series:

-

FET Type:

P-Channel

Drain to Source Voltage (Vdss):

60 V

Drive Voltage (Max Rds On, Min Rds On):

4.5V, 10V

Vgs(th) (Max) @ Id:

1V @ 250µA

Vgs (Max):

±20V

FET Feature:

-

Operating Temperature:

-55°C ~ 150°C (Tj)

Supplier Device Package:

TO-252-3

Base Product Number:

ZXMP6A17

Manufacturer:

Diodes Incorporated

Product Status:

Active

Technology:

MOSFET (Metal Oxide)

Current - Continuous Drain (Id) @ 25°C:

4.4A (Ta)

Rds On (Max) @ Id, Vgs:

125mOhm @ 2.3A, 10V

Gate Charge (Qg) (Max) @ Vgs:

17.7 nC @ 10 V

Input Capacitance (Ciss) (Max) @ Vds:

637 pF @ 30 V

Power Dissipation (Max):

2.11W (Ta)

Mounting Type:

Surface Mount

Package / Case:

TO-252-3, DPAK (2 Leads + Tab), SC-63

## Environmental & Export classification

RoHS Status:

ROHS3 Compliant

REACH Status:

REACH Unaffected

HTSUS:

8541.29.0095

Moisture Sensitivity Level (MSL):

1 (Unlimited)

ECCN:

EAR99

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on)}$	$I_D$ $T_A = 25^\circ C$
-60V	125m $\Omega$ @ $V_{GS} = -10V$	-6.6A
	190m $\Omega$ @ $V_{GS} = -4.5V$	-5.3A

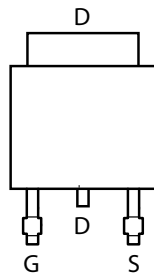
## Description and Applications

This new generation 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.

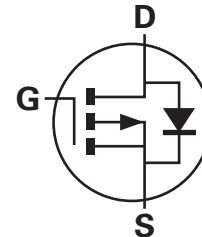
- Backlighting
- DC-DC Converters
- Power management functions



Top View



Pin Out -Top View



Equivalent Circuit

## Features and Benefits

- Low on-resistance
- Fast switching speed
- "Green" component and RoHS compliant (Note 1)

## Mechanical Data

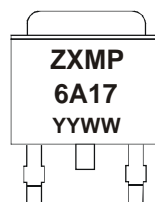
- Case: TO252-3L
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0 (Note 1)
- Moisture Sensitivity: Level 1 per J-STD-020D
- Terminals Connections: See Diagram
- Terminals: Matte Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Weight: 0.33 grams (approximate)

## Ordering Information (Note 1)

Product	Marking	Reel size (inches)	Tape width (mm)	Quantity per reel
ZXMP6A17KTC	See Below	13	16	2,500

Note: 1. Diodes, Inc. defines "Green" products as those which are Eu 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



ZXMP = Product Type Marking Code, Line 1  
 6A17 = Product Type Marking Code, Line 2  
 YYWW = Date Code Marking  
 YY = Year (ex: 09 = 2009)  
 WW = Week (01-52)


**Maximum Ratings** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic			Symbol	Value	Unit	
Drain-Source voltage			$V_{DS}$	-60	V	
Gate-Source voltage			$V_{GS}$	$\pm 20$	V	
Continuous Drain current	$V_{GS} = 10\text{V}$	(Note 3)	$I_D$	6.6	A	
		$T_A = 70^\circ\text{C}$ (Note 3)		5.3		
		(Note 2)		4.4		
Pulsed Drain current	$V_{GS} = 10\text{V}$	(Note 4)	$I_{DM}$	20.3	A	
Continuous Source current (Body diode)			(Note 3)	$I_S$	9.3	A
Pulsed Source current (Body diode)			(Note 4)	$I_{SM}$	20.3	A

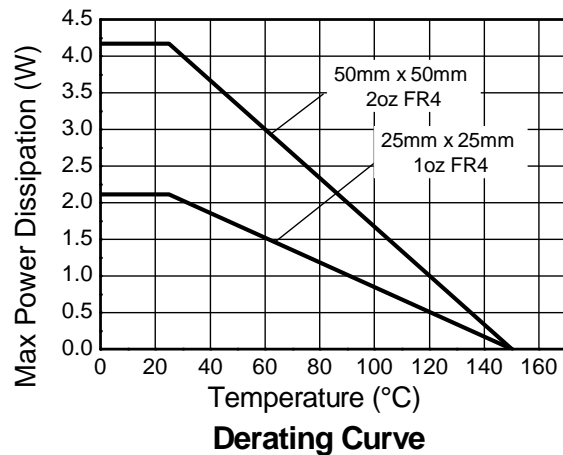
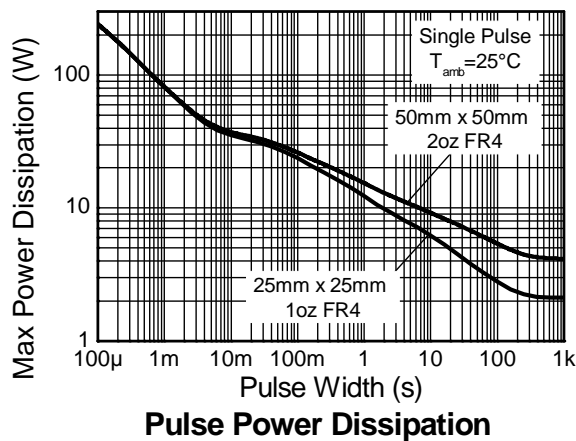
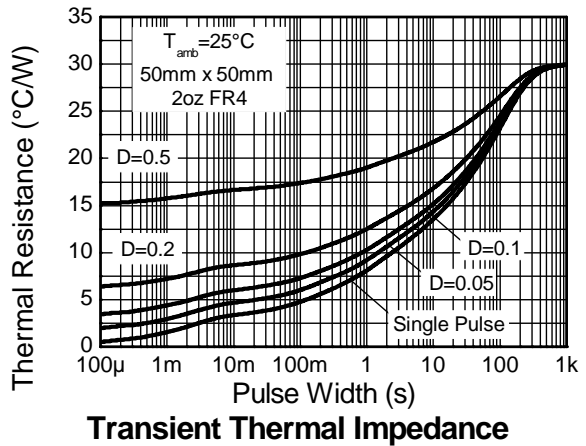
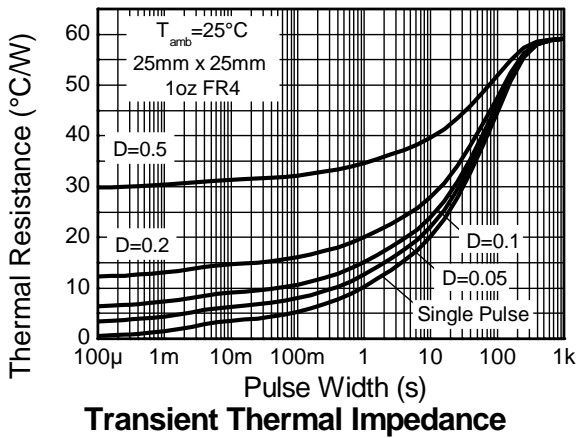
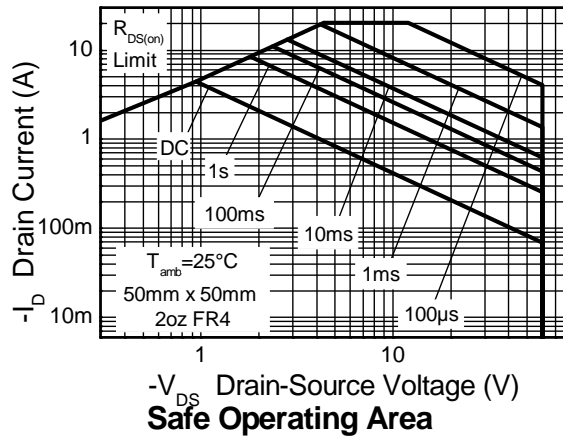
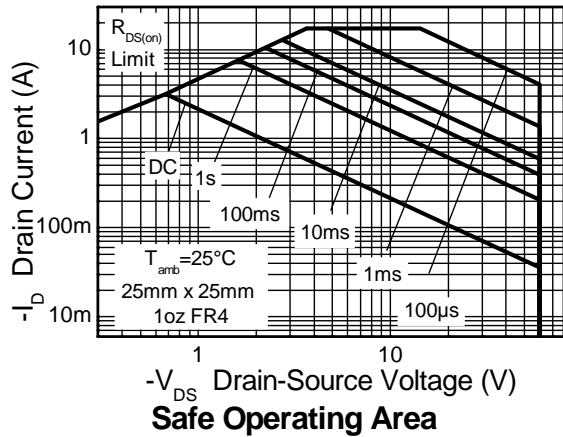
**Thermal Characteristics** @ $T_A = 25^\circ\text{C}$  unless otherwise specified

Characteristic		Symbol	Value	Unit	
Power dissipation Linear derating factor	(Note 2)	$P_D$	4.17	W mW/ $^\circ\text{C}$	
			33.3		
	(Note 3)		9.25		
	(Note 5)		74.0		
Thermal Resistance, Junction to Ambient	(Note 2)	$R_{\theta JA}$	2.11	$^\circ\text{C/W}$	
	(Note 3)		16.8		
	(Note 5)		30.0		
Thermal Resistance, Junction to Lead	(Note 3)	$R_{\theta JL}$	13.5	$^\circ\text{C/W}$	
	(Note 5)		59.1		
Thermal Resistance, Junction to Lead		(Note 6)	$R_{\theta JL}$	2.41	$^\circ\text{C/W}$
Operating and storage temperature range			$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$

- Notes:
2. For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz 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  $t \leq 10$  sec.
  4. Same as note 2, except the device is pulsed with  $D = 0.02$  and pulse width 300  $\mu\text{s}$ . The pulse current is limited by the maximum junction temperature.
  5. 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.
  6. Thermal resistance from junction to solder-point (at the end of the drain lead).



**Thermal Characteristics**



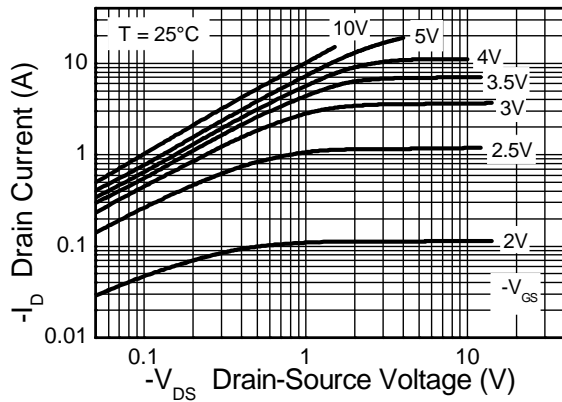

**Electrical Characteristics** @T<sub>A</sub> = 25°C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-60	—	—	V	I <sub>D</sub> = -250μA, V <sub>GS</sub> = 0V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-0.5	μA	V <sub>DS</sub> = -60V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±100	nA	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	-1.0	—	—	V	I <sub>D</sub> = -250μA, V <sub>DS</sub> = V <sub>GS</sub>
Static Drain-Source On-Resistance (Note 7)	R <sub>DS(on)</sub>	—	—	0.125	Ω	V <sub>GS</sub> = -10V, I <sub>D</sub> = -2.3A
				0.190		V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -1.9A
Forward Transconductance (Notes 7 & 8)	g <sub>fs</sub>	—	4.7	—	S	V <sub>DS</sub> = -15V, I <sub>D</sub> = -2.2A
Diode Forward Voltage (Note 7)	V <sub>SD</sub>	—	-0.85	-0.95	V	I <sub>S</sub> = -2A, V <sub>GS</sub> = 0V
Reverse recovery time (Note 8)	t <sub>rr</sub>	—	25.1	—	ns	I <sub>S</sub> = -1.7A, di/dt = 100A/μs
Reverse recovery charge (Note 8)	Q <sub>rr</sub>	—	27.2	—	nC	
<b>DYNAMIC CHARACTERISTICS (Note 8)</b>						
Input Capacitance	C <sub>iss</sub>	—	637	—	pF	V <sub>DS</sub> = -30V, V <sub>GS</sub> = 0V f = 1MHz
Output Capacitance	C <sub>oss</sub>	—	70	—	pF	
Reverse Transfer Capacitance	C <sub>rss</sub>	—	53	—	pF	
Total Gate Charge	Q <sub>g</sub>	—	9.0	—	nC	V <sub>GS</sub> = -4.5V
Total Gate Charge	Q <sub>g</sub>	—	17.7	—	nC	V <sub>GS</sub> = -10V
Gate-Source Charge	Q <sub>gs</sub>	—	1.6	—	nC	
Gate-Drain Charge	Q <sub>gd</sub>	—	4.4	—	nC	
Turn-On Delay Time (Note 9)	t <sub>D(on)</sub>	—	2.6	—	ns	V <sub>DD</sub> = -30V, V <sub>GS</sub> = -10V I <sub>D</sub> = -1A, R <sub>G</sub> ≅ 6.0Ω
Turn-On Rise Time (Note 9)	t <sub>r</sub>	—	3.4	—	ns	
Turn-Off Delay Time (Note 9)	t <sub>D(off)</sub>	—	26.2	—	ns	
Turn-Off Fall Time (Note 9)	t <sub>f</sub>	—	11.3	—	ns	

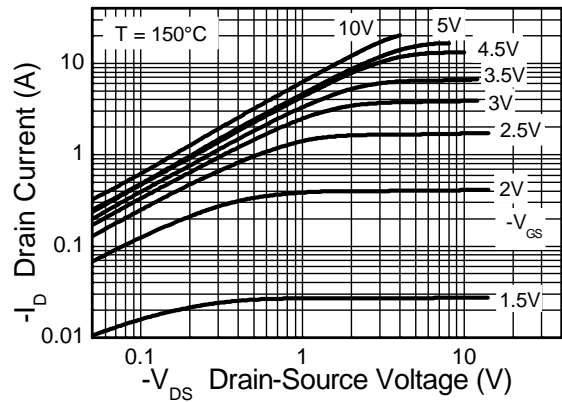
- Notes:
7. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%
  8. For design aid only, not subject to production testing.
  9. Switching characteristics are independent of operating junction temperatures.



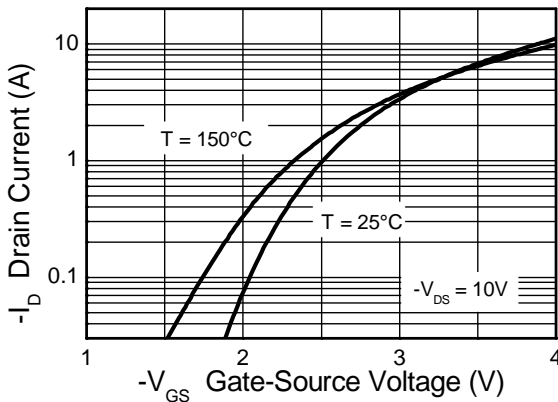
**Typical Characteristics**



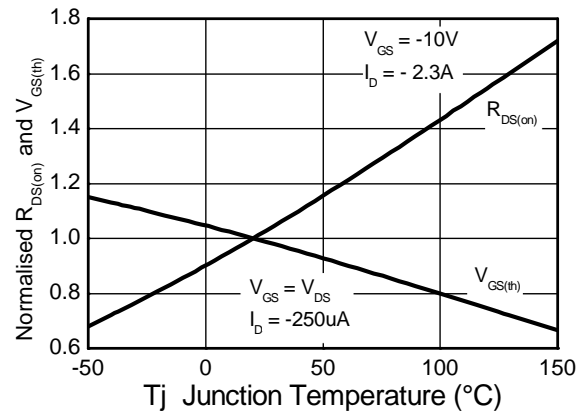
**Output Characteristics**



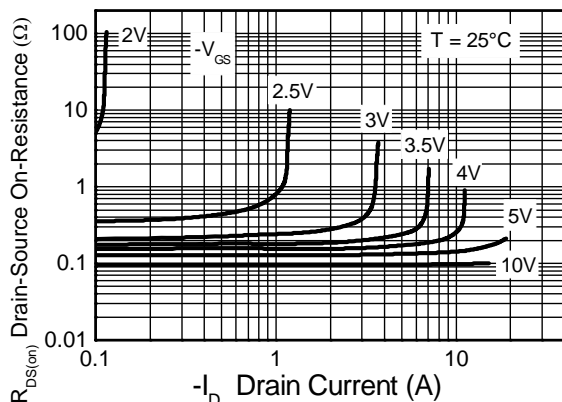
**Output Characteristics**



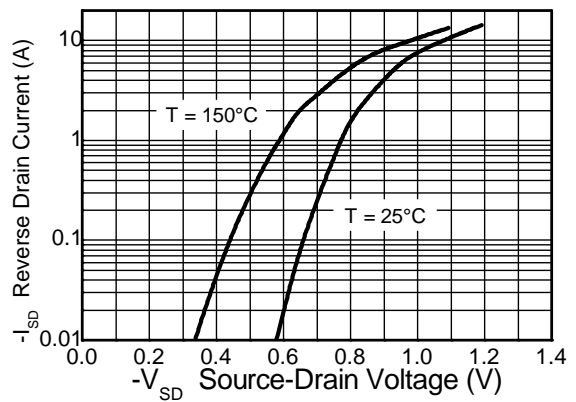
**Typical Transfer Characteristics**



**Normalised Curves v Temperature**

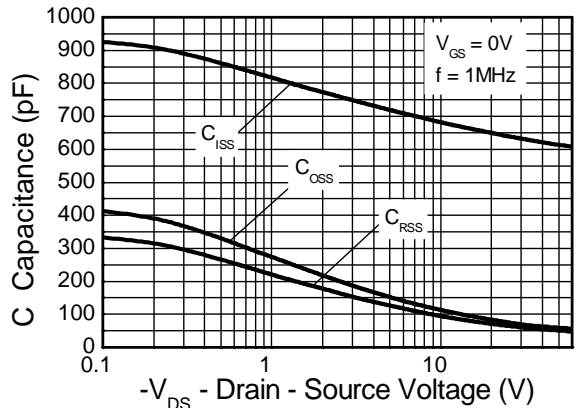


**On-Resistance v Drain Current**

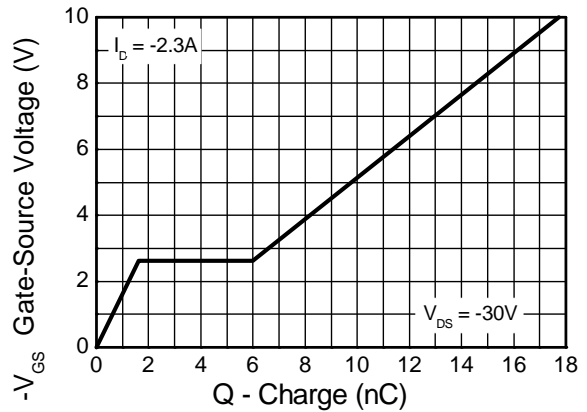


**Source-Drain Diode Forward Voltage**

**Typical Characteristics - continued**

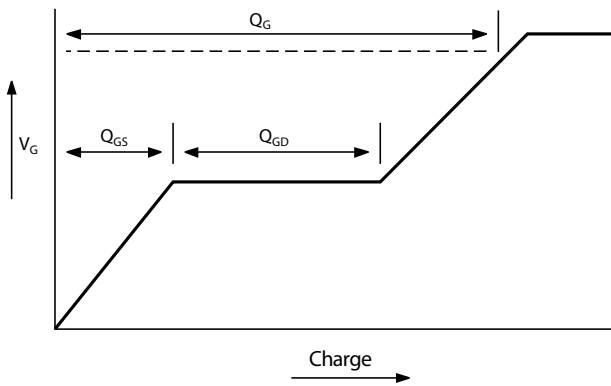


**Capacitance v Drain-Source Voltage**

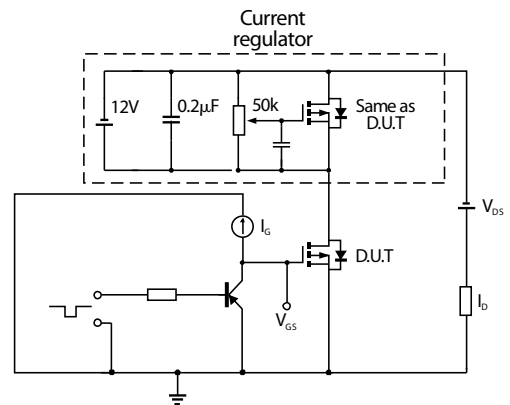


**Gate-Source Voltage v Gate Charge**

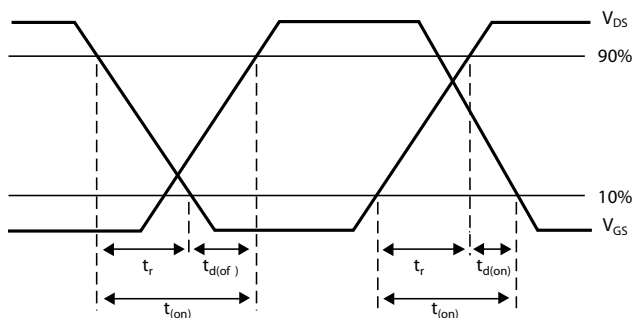
**Test Circuits**



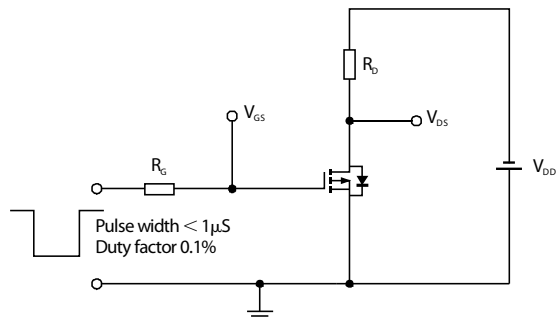
**Basic gate charge waveform**



**Gate charge test circuit**



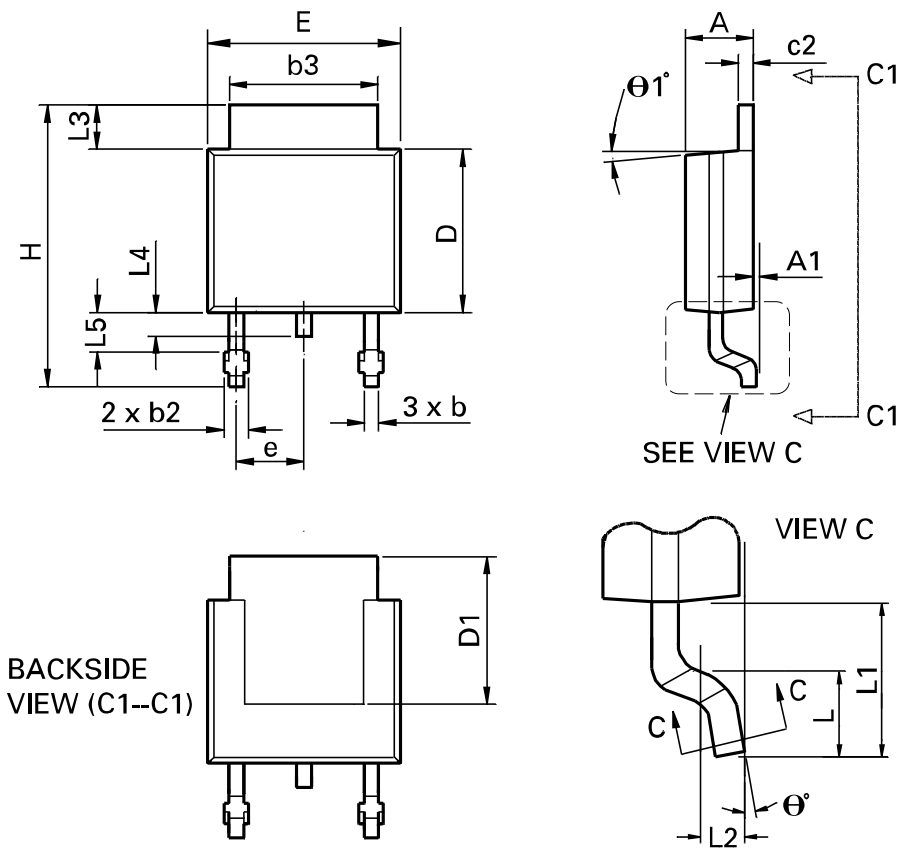
**Switching time waveforms**



**Switching time test circuit**

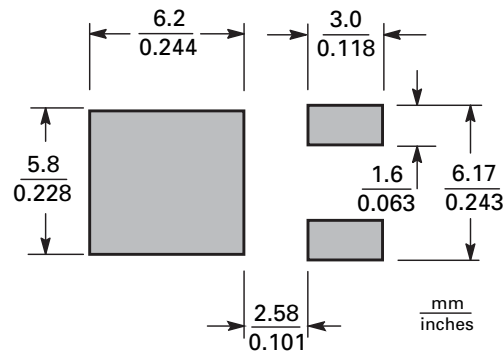


**Package Outline Dimensions**



DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min	Max	Min	Max		Min	Max	Min	Max
A	0.086	0.094	2.18	2.39	e	0.090 BSC		2.29 BSC	
A1	-	0.005	-	0.127	H	0.370	0.410	9.40	10.41
b	0.020	0.035	0.508	0.89	L	0.055	0.070	1.40	1.78
b2	0.030	0.045	0.762	1.14	L1	0.108 REF		2.74 REF	
b3	0.205	0.215	5.21	5.46	L2	0.020 BSC		0.508 BSC	
c	0.018	0.024	0.457	0.61	L3	0.035	0.065	0.89	1.65
c2	0.018	0.023	0.457	0.584	L4	0.025	0.040	0.635	1.016
D	0.213	0.245	5.41	6.22	L5	0.045	0.060	1.14	1.52
D1	0.205	-	5.21	-	theta1°	0°	10°	0°	10°
E	0.250	0.265	6.35	6.73	theta°	0°	15°	0°	15°
E1	0.170	-	4.32	-	-	-	-	-	-

## Suggested Pad Layout



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