

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on) \max}$	$I_D$ $T_A = +25^\circ\text{C}$
-20V	35m $\Omega$ @ $V_{GS} = -4.5\text{V}$	-6.0A
	45m $\Omega$ @ $V_{GS} = -2.5\text{V}$	-5.2A

## 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

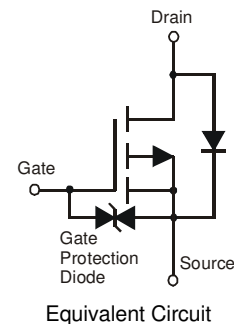
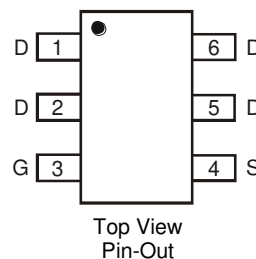
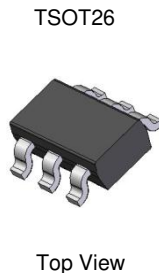
- DC-DC Converters
- Motor Control
- Power management functions
- Analog Switch

## Features and Benefits

- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- ESD protected Up To 3kV
- **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**
- **PPAP Capable (Note 4)**

## Mechanical Data

- Case: TSOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208  $\text{\textcircled{E}}$
- Weight: 0.013 grams (Approximate)

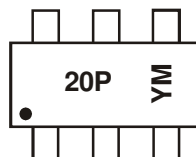


## Ordering Information (Note 5)

Part Number	Case	Packaging
DMP2035UVTQ-7	TSOT26	3,000/Tape & Reel
DMP2035UVTQ-13	TSOT26	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](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-Q10x qualified and are PPAP capable. Automotive, AEC-Q10x 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/](http://www.diodes.com/quality/product_compliance_definitions/).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



20P = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: Y = 2011)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2011	2012	2013	2014	2015	2016	2017
Code	Y	Z	A	B	C	D	E

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>	-20	V
Gate-Source Voltage			V <sub>GSS</sub>	±12	V
Continuous Drain Current (Note 7) V <sub>GS</sub> = -4.5V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-6.0 -4.8	A
	t < 10s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-7.2 -5.7	A
Continuous Drain Current (Note 7) V <sub>GS</sub> = -2.5V	Steady State	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-5.2 -4.1	A
	t < 10s	T <sub>A</sub> = +25°C T <sub>A</sub> = +70°C	I <sub>D</sub>	-6.2 -4.9	A
Maximum Continuous Body Diode Forward Current (Note 7)			I <sub>S</sub>	-2.0	A
Pulsed Drain Current (10μs pulse, duty cycle = 1%)			I <sub>DM</sub>	-24	A

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

Characteristic		Symbol	Value	Units
Total Power Dissipation (Note 6)		P <sub>D</sub>	1.2	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	R <sub>θJA</sub>	106	°C/W
	t < 10s		74	
Total Power Dissipation (Note 7)		P <sub>D</sub>	2.0	W
Thermal Resistance, Junction to Ambient (Note 7)	Steady State	R <sub>θJA</sub>	65	°C/W
	t < 10s		46	
Thermal Resistance, Junction to Case (Note 7)		R <sub>θJC</sub>	11.8	
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 8)</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-20	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	-1	μA	V <sub>DS</sub> = -20V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±10	μA	V <sub>GS</sub> = ±8V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	-0.4	-0.7	-1.5	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA
Gate Threshold Voltage Temperature Coefficient	ΔV <sub>GS(th)</sub> /ΔT <sub>J</sub>	—	2.5	—	mV/°C	I <sub>D</sub> = -250μA, Referenced to +25°C
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	23	35	mΩ	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4.0A
		—	30	45		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -4.0A
		—	41	62		V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -2.0A
Forward Transfer Admittance	Y <sub>fs</sub>	—	18	—	S	V <sub>DS</sub> = -5V, I <sub>D</sub> = -5.5A
Diode Forward Voltage (Note 7)	V <sub>SD</sub>	—	-0.7	-1.0	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = -1A
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	C <sub>iss</sub>	—	1610	2400	pF	V <sub>DS</sub> = -10V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	157	210		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	145	200		
Gate Resistance	R <sub>G</sub>	—	9.4	14.1	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1.0MHz
Total Gate Charge	Q <sub>g</sub>	—	15.4	23.1	nC	V <sub>DS</sub> = -10V, V <sub>GS</sub> = -4.5V I <sub>D</sub> = -4A
Gate-Source Charge	Q <sub>gs</sub>	—	2.5	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	3.3	—		
Turn-On Delay Time	t <sub>D(on)</sub>	—	17	33	ns	V <sub>GS</sub> = -4.5V, V <sub>DS</sub> = -10V, R <sub>G</sub> = 6Ω, I <sub>D</sub> = -1A, R <sub>L</sub> = 10Ω
Turn-On Rise Time	t <sub>r</sub>	—	12	19		
Turn-Off Delay Time	t <sub>D(off)</sub>	—	94	150		
Turn-Off Fall Time	t <sub>f</sub>	—	42	64		
Reverse Recovery Time	t <sub>rr</sub>	—	14	25	ns	I <sub>F</sub> = -4.5A, di/dt = 100A/μS
Reverse Recovery Charge	Q <sub>rr</sub>	—	4	8	nC	

- 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 1 inch square copper plate.
  8. Short duration pulse test used to minimize self-heating effect.
  9. Guaranteed by design. Not subject to product testing.

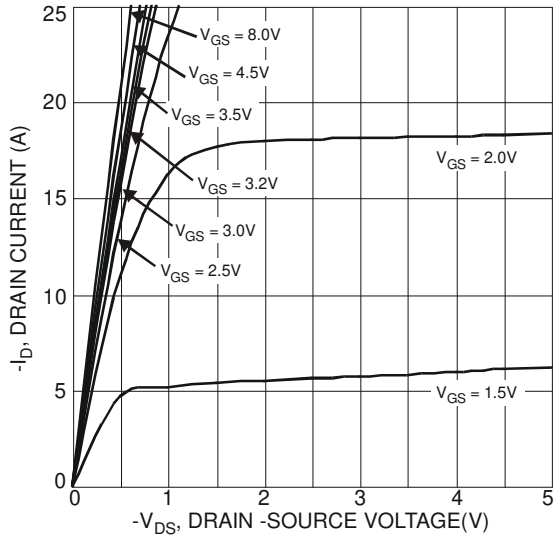


Fig. 1 Typical Output Characteristics

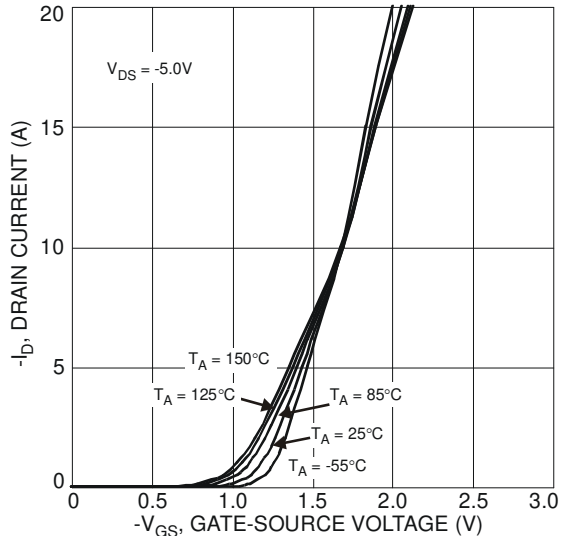


Fig. 2 Typical Transfer Characteristics

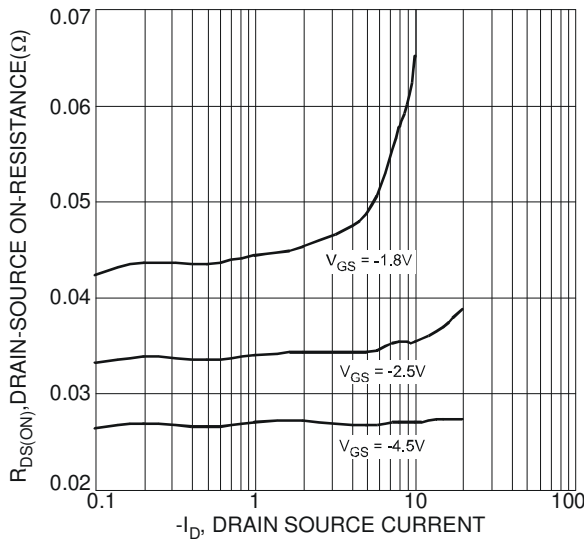


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

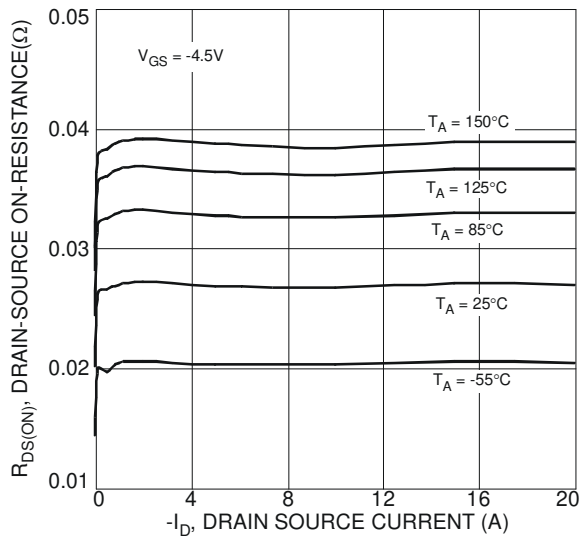


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

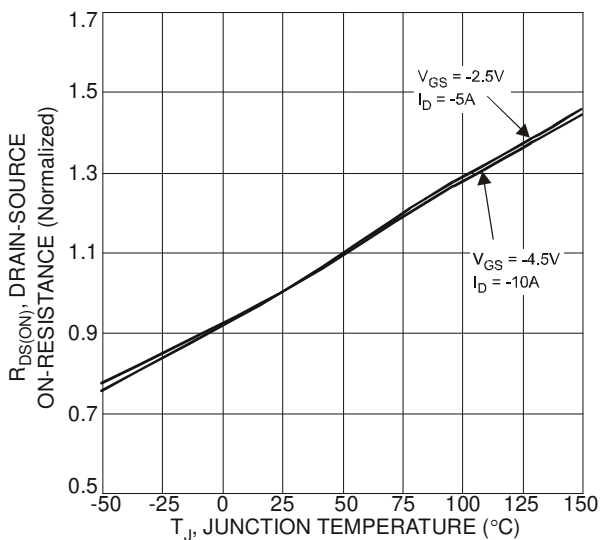


Fig. 5 On-Resistance Variation with Temperature

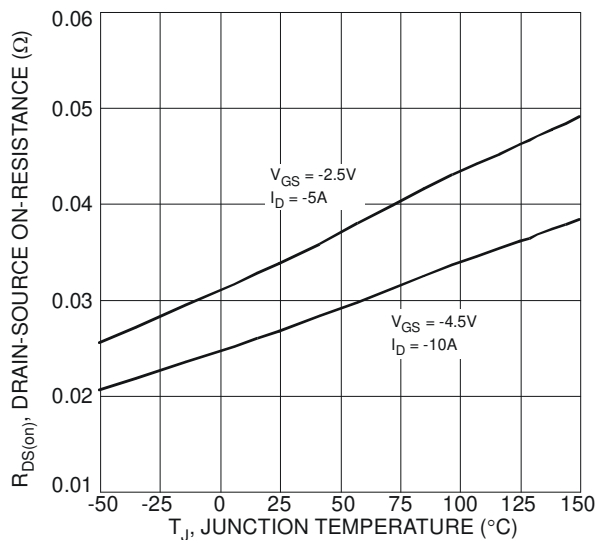


Fig. 6 On-Resistance Variation with Temperature

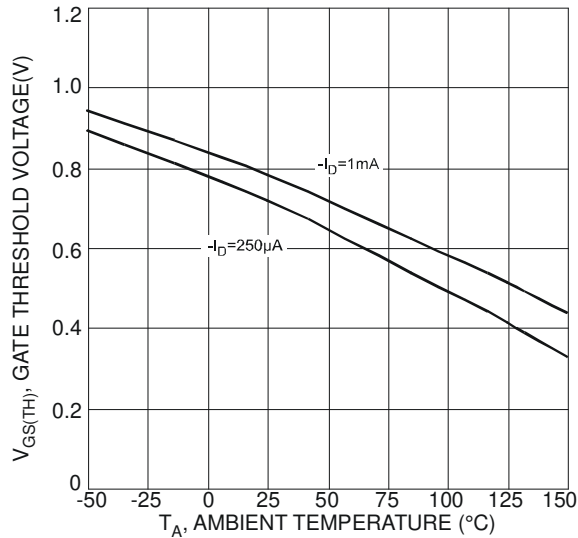


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

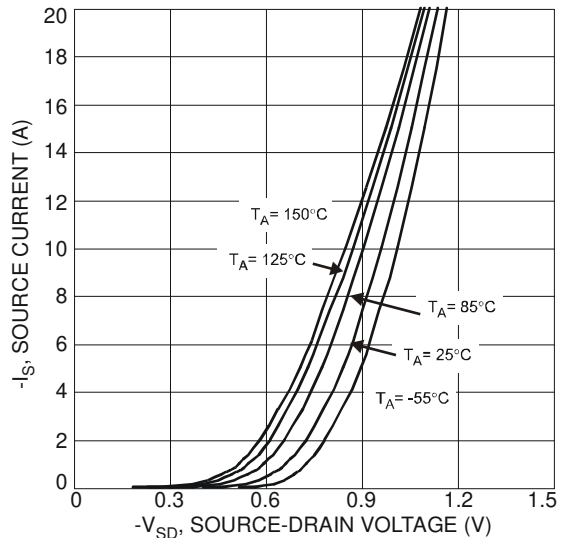


Fig. 8 Diode Forward Voltage vs. Current

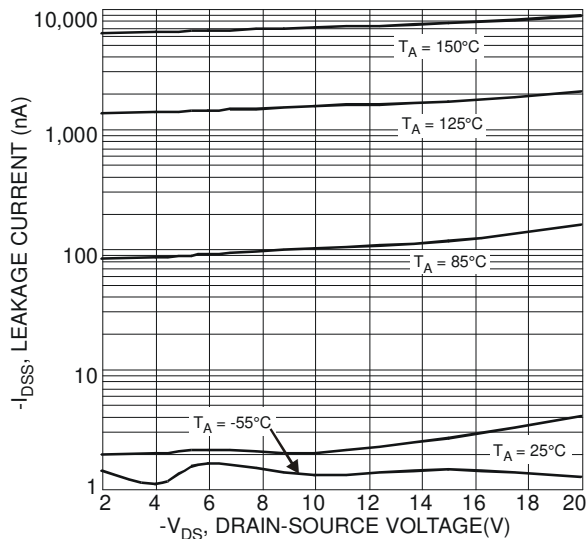


Fig. 9 Typical Drain-Source Leakage Current vs. Voltage

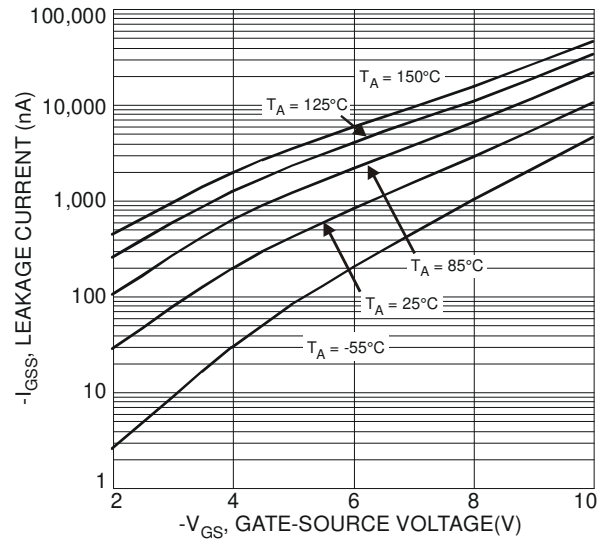


Fig. 10 Typical Gate-Source Leakage Current vs. Voltage

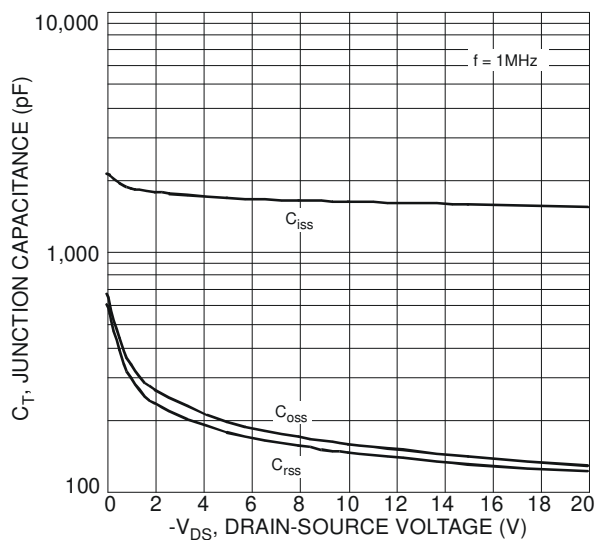


Fig. 11 Typical Junction Capacitance

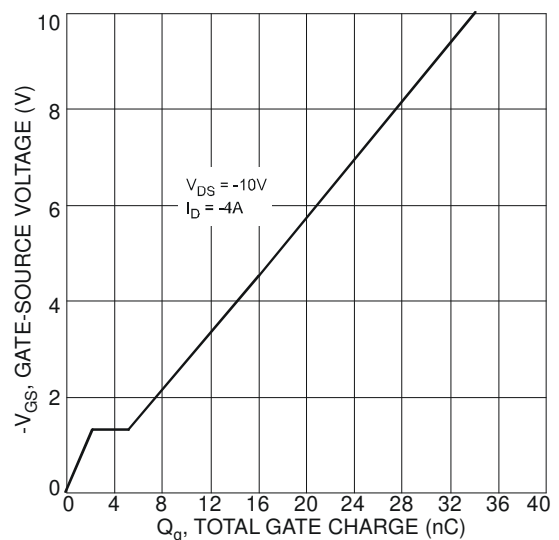


Fig. 12 Gate-Charge Characteristics

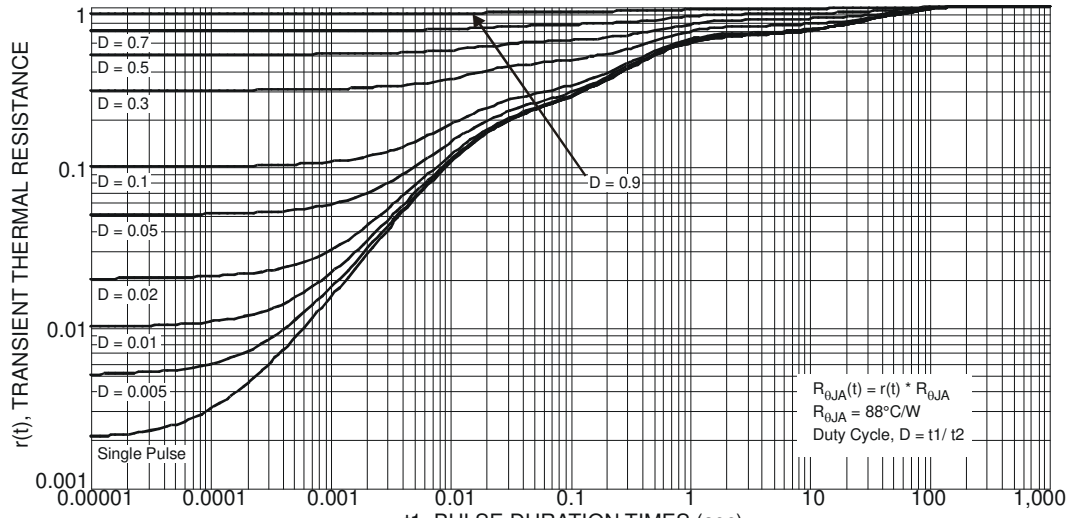
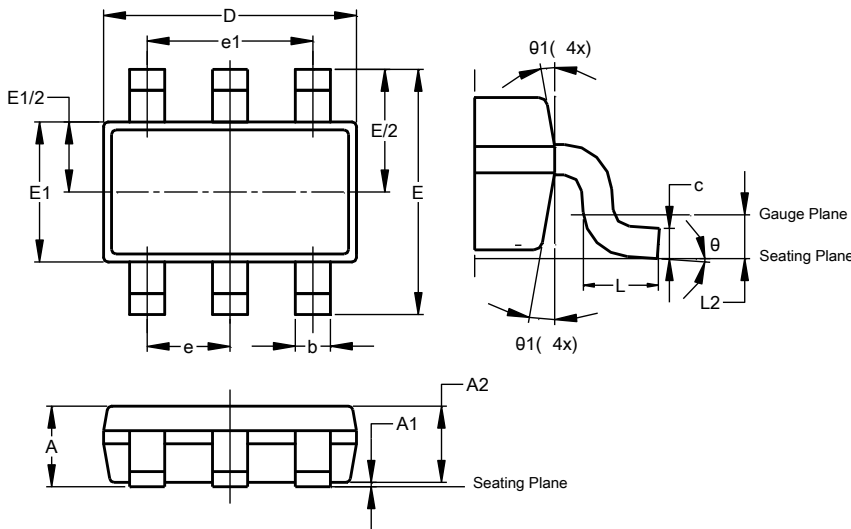


Fig. 13 Transient Thermal Resistance

**Package Outline Dimensions**

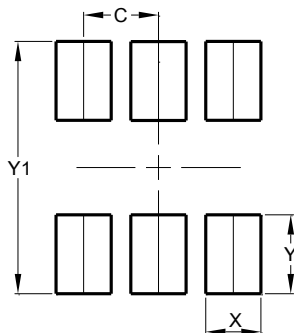
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



TSOT26			
Dim	Min	Max	Typ
A	—	1.00	—
A1	0.010	0.100	—
A2	0.840	0.900	—
D	2.800	3.000	2.900
E	2.800 BSC		
E1	1.500	1.700	1.600
b	0.300	0.450	—
c	0.120	0.200	—
e	0.950 BSC		
e1	1.900 BSC		
L	0.30	0.50	—
L2	0.250 BSC		
θ	0°	8°	4°
θ1	4°	12°	—
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**

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



Dimensions	Value (in mm)
C	0.950
X	0.700
Y	1.000
Y1	3.199

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