

## Product Summary

$V_{(BR)DSS}$	$R_{DS(on) \max}$	$I_D$ $T_A = 25^\circ\text{C}$
-30V	75m $\Omega$ @ $V_{GS} = -10\text{V}$	-3.9A
	105m $\Omega$ @ $V_{GS} = -4.5\text{V}$	-3.3A

## Features and Benefits

- Low Input Capacitance
- Low On-Resistance
- Fast Switching Speed
- Low Input/Output Leakage
- **Lead, Halogen, and Antimony Free, RoHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Qualified to AEC-Q101 Standards for High Reliability**

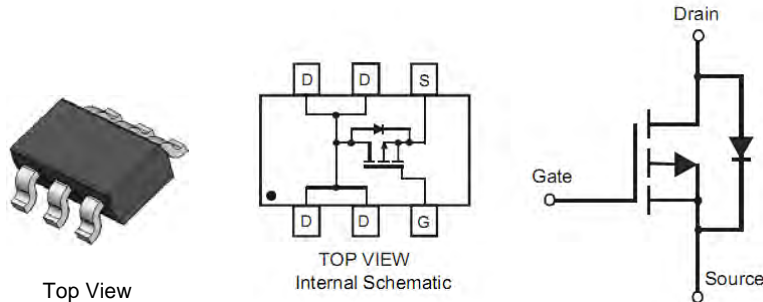
## Description and Applications

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.

- DC-DC Converters
- Power management functions
- Backlighting
- Motor Control

## 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
- Weight: 0.013 grams (approximate)

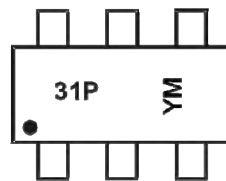


## Ordering Information (Note 3)

Part Number	Case	Packaging
DMP3105LVT-7	TSOT26	3,000/Tape & Reel

- Notes:
1. No purposefully added lead. Halogen and Antimony Free.
  2. Diodes Inc.'s "Green" policy can be found on our website at <http://www.diodes.com>.
  3. For packaging details, go to our website at <http://www.diodes.com>.

## Marking Information



31P = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: X = 2010)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2010	2011	2012	2013	2014	2015	2016
Code	X	Y	Z	A	B	C	D

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

Characteristic			Symbol	Value	Units
Drain-Source Voltage			$V_{DSS}$	-30	V
Gate-Source Voltage			$V_{GSS}$	$\pm 12$	V
Continuous Drain Current (Note 4) $V_{GS} = -10\text{V}$	Steady State	$T_A = 25^\circ\text{C}$	$I_D$	3.1	A
		$T_A = 70^\circ\text{C}$		2.5	
Continuous Drain Current (Note 4) $V_{GS} = -4.5\text{V}$	Steady State	$T_A = 25^\circ\text{C}$	$I_D$	2.7	A
		$T_A = 70^\circ\text{C}$		2.2	
Continuous Drain Current (Note 5) $V_{GS} = -10\text{V}$	Steady State	$T_A = 25^\circ\text{C}$	$I_D$	3.9	A
		$T_A = 70^\circ\text{C}$		3.1	
Continuous Drain Current (Note 5) $V_{GS} = -4.5\text{V}$	Steady State	$T_A = 25^\circ\text{C}$	$I_D$	3.3	A
		$T_A = 70^\circ\text{C}$		2.7	
Maximum Continuous Body Diode Forward Current			$I_S$	2.2	A
Pulsed Drain Current (10 $\mu\text{s}$ pulse, duty cycle=1%)			$I_{DM}$	20	A

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

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 4)	$P_D$	1.15	W
Thermal Resistance, Junction to Ambient (Note 4)	$R_{\theta JA}$	108	$^\circ\text{C/W}$
Total Power Dissipation (Note 5)	$P_D$	1.75	W
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	72	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case (Note 5)	$R_{\theta JC}$	23.4	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS (Note 6)</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-30	—	—	V	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$
Zero Gate Voltage Drain Current	$I_{DSS}$	—	—	-100	nA	$V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$
Gate-Source Leakage	$I_{GSS}$	—	—	$\pm 100$	nA	$V_{GS} = \pm 12\text{V}, V_{DS} = 0\text{V}$
<b>ON CHARACTERISTICS (Note 6)</b>						
Gate Threshold Voltage	$V_{GS(th)}$	-0.5	-0.9	-1.5	V	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$
Static Drain-Source On-Resistance	$R_{DS(on)}$	—	65	75	m $\Omega$	$V_{GS} = -10\text{V}, I_D = -4.2\text{A}$
		—	75	98		$V_{GS} = -4.5\text{V}, I_D = -4.0\text{A}$
		—	98	150		$V_{GS} = -2.5\text{V}, I_D = -3.0\text{A}$
Forward Transfer Admittance	$ Y_{fs} $	—	5	—	S	$V_{DS} = -15\text{V}, I_D = -4.0\text{A}$
Diode Forward Voltage	$V_{SD}$	—	-0.7	-1.0	V	$V_{GS} = 0\text{V}, I_S = -1\text{A}$
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Input Capacitance	$C_{iss}$	—	839	—	pF	$V_{DS} = -15\text{V}, V_{GS} = 0\text{V}$ $f = 1.0\text{MHz}$
Output Capacitance	$C_{oss}$	—	47	—		
Reverse Transfer Capacitance	$C_{rss}$	—	43	—		
Gate Resistance	$R_G$	—	12.3	—	$\Omega$	$V_{DS} = 0\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$
Total Gate Charge ( $V_{GS} = -4.5\text{V}$ )	$Q_g$	—	9.0	—	nC	$V_{DS} = -15\text{V}, I_D = -4.0\text{A}$
Total Gate Charge ( $V_{GS} = -10.0\text{V}$ )	$Q_g$	—	19.8	—		
Gate-Source Charge	$Q_{gs}$	—	1.6	—		
Gate-Drain Charge	$Q_{gd}$	—	1.1	—		
Turn-On Delay Time	$t_{D(on)}$	—	9.7	—	ns	$V_{GS} = -10\text{V}, V_{DD} = -15\text{V}, R_G = 6\Omega,$ $I_D = -1\text{A}$
Turn-On Rise Time	$t_r$	—	17.7	—		
Turn-Off Delay Time	$t_{D(off)}$	—	269	—		
Turn-Off Fall Time	$t_f$	—	64	—		

- 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 thermal vias to bottom layer 1inch square copper plate
  - Short duration pulse test used to minimize self-heating effect.
  - Guaranteed by design. Not subject to production testing.

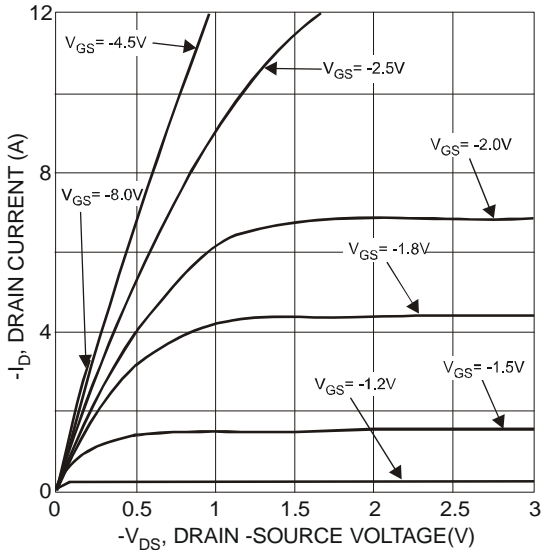


Fig. 1 Typical Output Characteristics

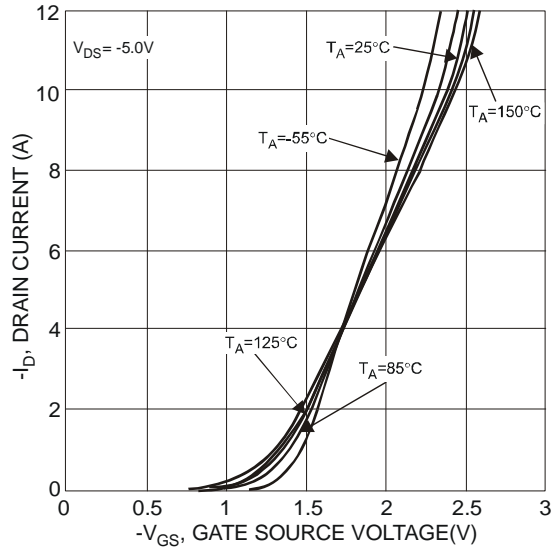


Fig. 2 Typical Transfer Characteristics

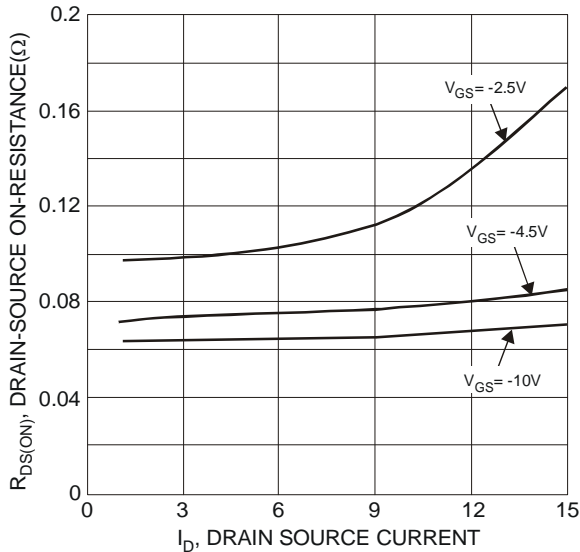


Fig. 3 Typical On-Resistance vs. Drain Current and Gate Voltage

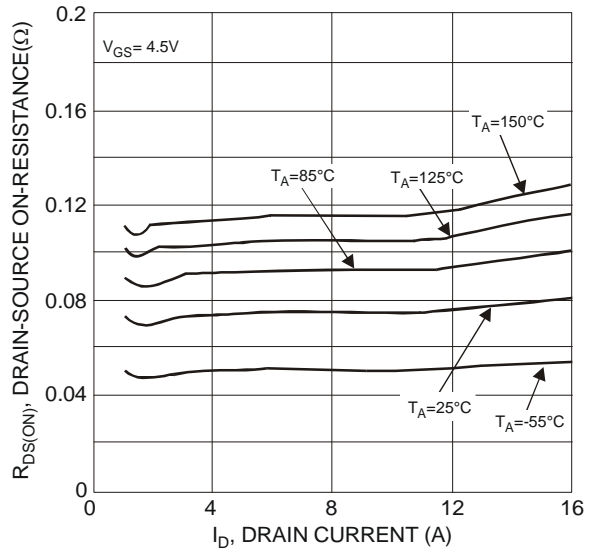


Fig. 4 Typical On-Resistance vs. Drain Current and Temperature

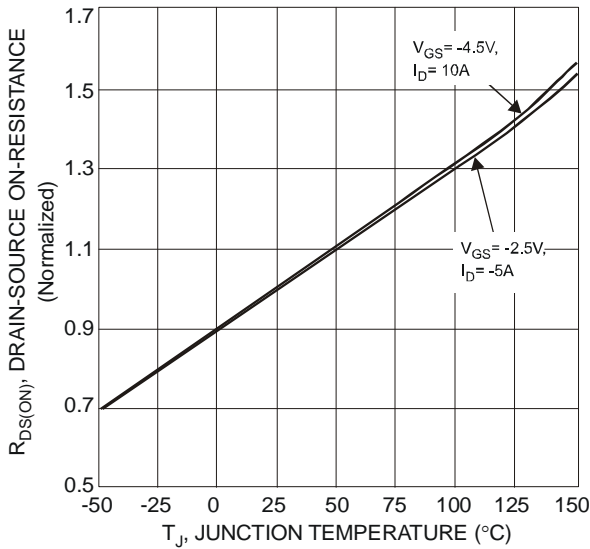


Fig. 5 On-Resistance Variation with Temperature

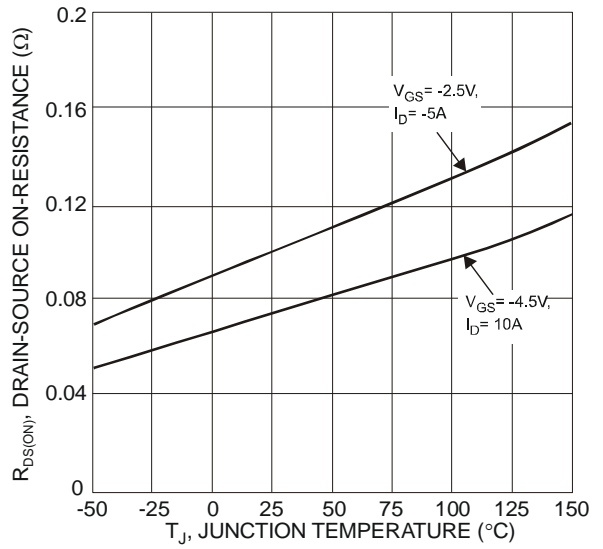


Fig. 6 On-Resistance Variation with Temperature

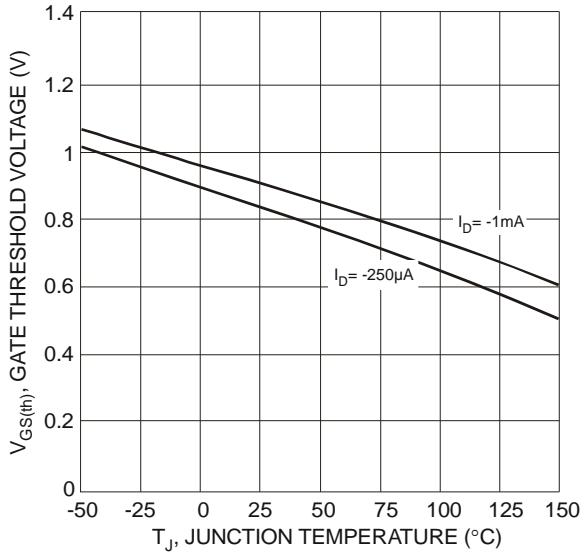


Fig. 7 Gate Threshold Variation vs. Ambient Temperature

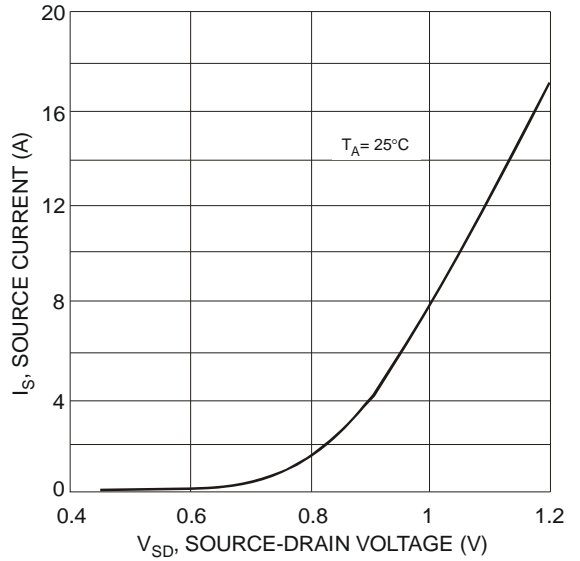


Fig. 8 Diode Forward Voltage vs. Current

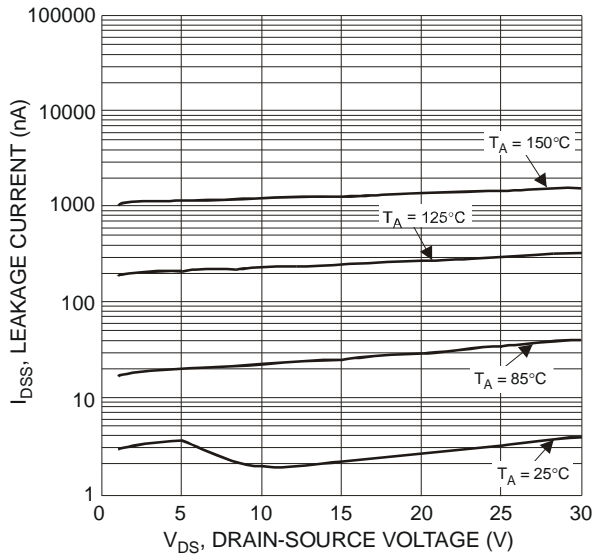


Fig. 9 Typical Drain-Source Leakage Current vs. Voltage

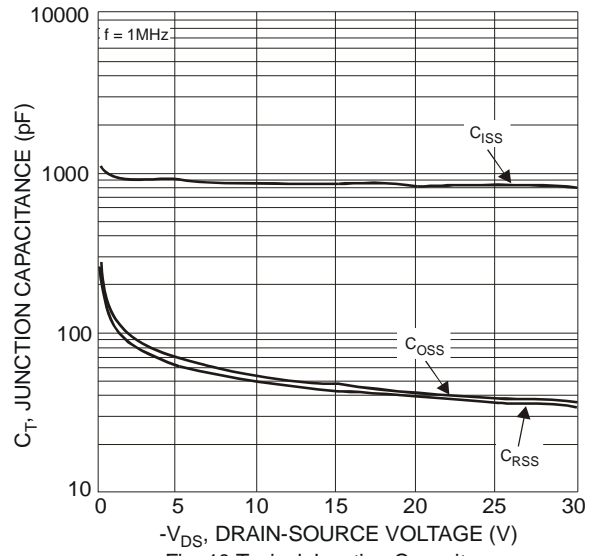


Fig. 10 Typical Junction Capacitance

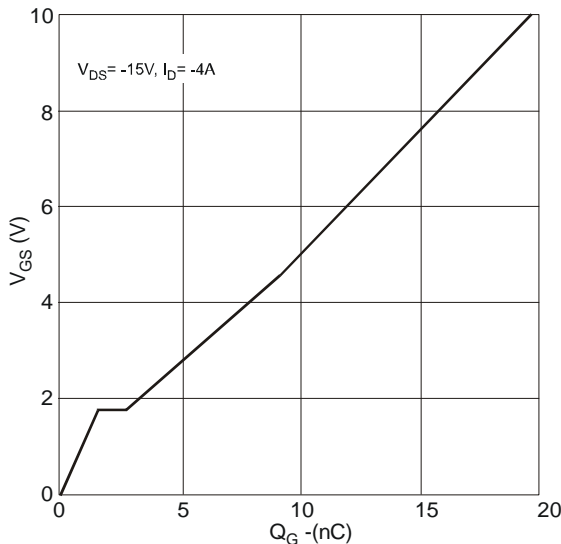


Fig. 11 Gate Charge Characteristics

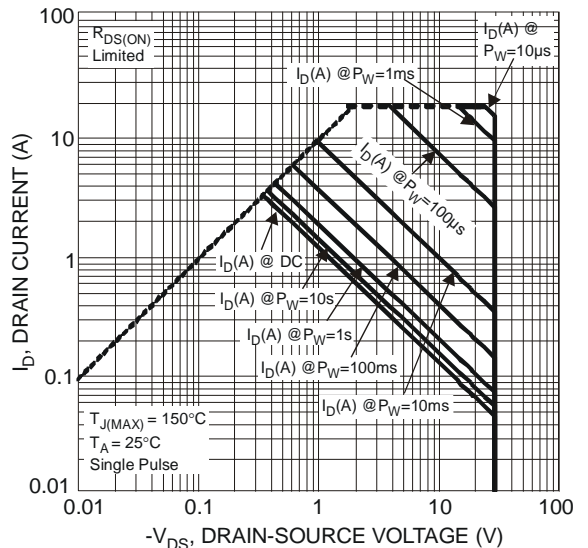


Fig. 12 SOA, Safe Operation Area

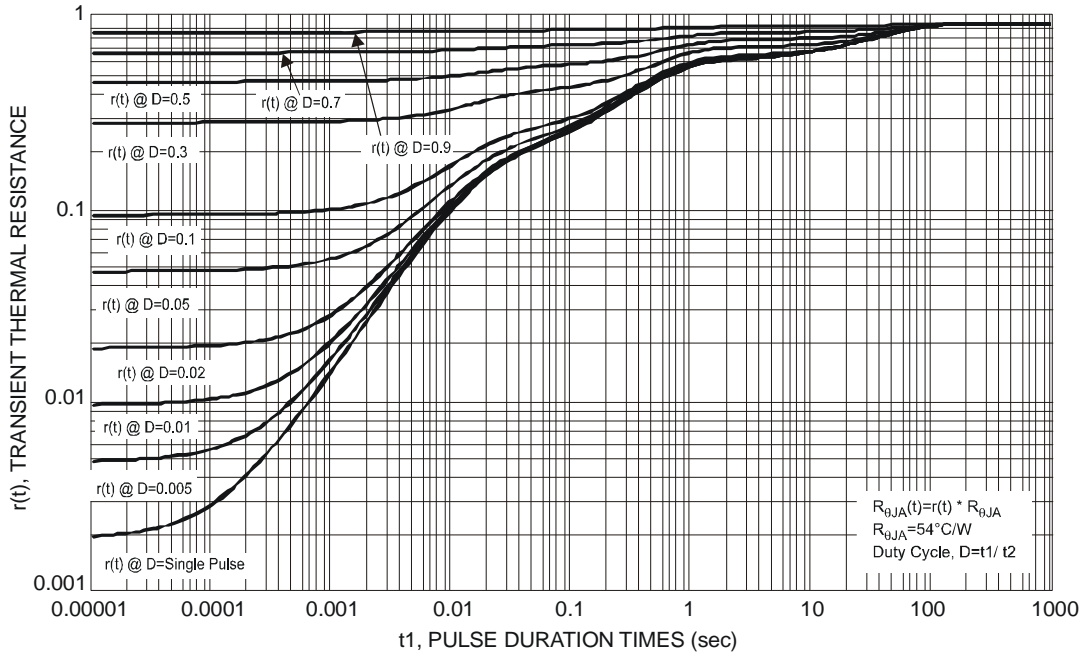
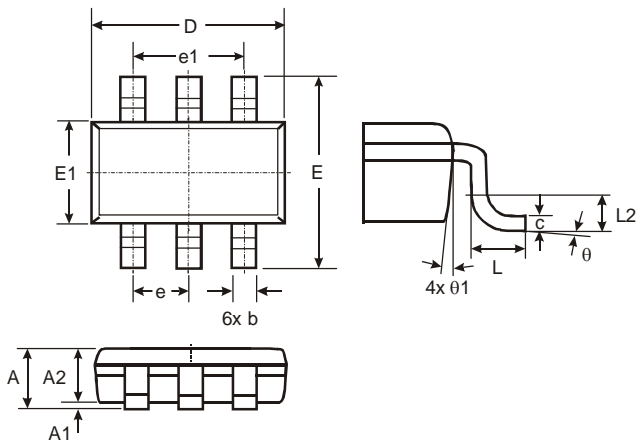


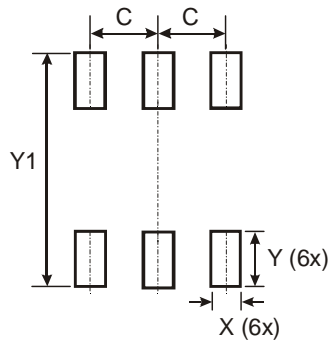
Fig. 13 Transient Thermal Resistance

**Package Outline Dimensions**



TSOT26			
Dim	Min	Max	Typ
A	—	1.00	—
A1	0.01	0.10	—
A2	0.84	0.90	—
D	—	—	2.90
E	—	—	2.80
E1	—	—	1.60
b	0.30	0.45	—
c	0.12	0.20	—
e	—	—	0.95
e1	—	—	1.90
L	0.30	0.50	—
L2	—	—	0.25
θ	0°	8°	4°
θ1	4°	12°	—
<b>All Dimensions in mm</b>			

**Suggested Pad Layout**



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

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