

Product Summary

BV _{DSS}	R _{DS(ON)} Max	I _D T _A = +25°C
20V	24mΩ @ V _{GS} = 4.5V	7A
	28mΩ @ V _{GS} = 2.5V	5A

Description and Applications

This MOSFET is designed to meet the stringent requirements of automotive applications. It is qualified to AEC-Q101, supported by a PPAP, and is ideal for use in:

- Backlighting
- DC-DC Converters
- Power Management Functions

Features and Benefits

- Low On-Resistance
- Low-Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- **ESD Protected Gate**
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DMN2024UVTQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

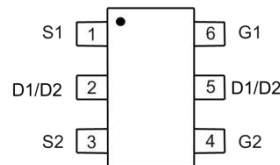
- Case: TSOT26
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals Connections: See Diagram
- Terminals: Finish—Matte Tin Annealed Over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.013 grams (Approximate)



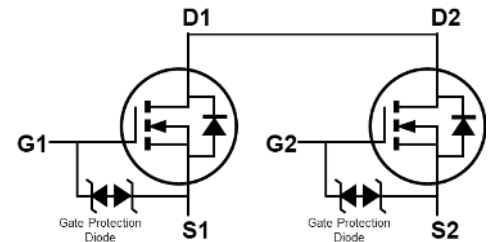
ESD Protected Gate



TSOT26



Top View



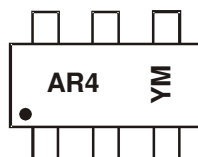
Equivalent Circuit

Ordering Information (Note 4)

Part Number	Case	Packaging
DMN2024UVTQ-7	TSOT26	3,000/Tape & Reel
DMN2024UVTQ-13	TSOT26	10,000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



AR4 = Product Type Marking Code
 YM = Date Code Marking
 Y or \bar{Y} = Year (ex: I = 2021)
 M = Month (ex: 9 = September)

Date Code Key

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	H	I	J	K	L	M	N	O	P	R	S	T
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	Unit	
Drain-Source Voltage	V _{DSS}	20	V	
Gate-Source Voltage	V _{GSS}	±10	V	
Continuous Drain Current (Note 6) V _{GS} = 4.5V	I _D	T _A = +25°C	7.0	A
Steady State		T _A = +70°C	5.0	A
Maximum Continuous Body Diode Forward Current (Note 6)	I _S	2.3	A	
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	35	A	

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	1.0	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	124	°C/W
Total Power Dissipation (Note 6)	P _D	1.6	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	78	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 7)						
Drain-Source Breakdown Voltage	BV _{DSS}	20	—	—	V	V _{GS} = 0V, I _D = 250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1.0	µA	T _J = +25°C, V _{DS} = 20V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±10	µA	V _{GS} = ±8V, V _{DS} = 0V
ON CHARACTERISTICS (Note 7)						
Gate Threshold Voltage	V _{GS(TH)}	0.5	—	0.9	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	19	24	mΩ	V _{GS} = 4.5V, I _D = 6.5A
			22	28		V _{GS} = 2.5V, I _D = 5.5A
			25	34		V _{GS} = 1.8V, I _D = 3.5A
Diode Forward Voltage	V _{SD}	—	0.9	1.2	V	V _{GS} = 0V, I _D = 5A
DYNAMIC CHARACTERISTICS (Note 8)						
Input Capacitance	C _{ISS}	—	647	—	pF	V _{DS} = 10V, V _{GS} = 0V f = 1.0MHz
Output Capacitance	C _{OSS}	—	78	—	pF	
Reverse Transfer Capacitance	C _{RSS}	—	38	—	pF	
Gate Resistance	R _G	100	400	800	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _G	—	7.1	—	nC	V _{GS} = 4.5V, V _{DS} = 10V, I _D = 6.5A
Gate-Source Charge	Q _{GS}	—	0.9	—	nC	
Gate-Drain Charge	Q _{GD}	—	0.7	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	98	—	ns	V _{DS} = 10V, V _{GS} = 4.5V, R _L = 10Ω, R _G = 6Ω, I _D = 1A
Turn-On Rise Time	t _R	—	140	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	1024	—	ns	
Turn-Off Fall Time	t _F	—	434	—	ns	
Reverse Recovery Time	t _{RR}	—	245	—	ns	I _F = 1.0A, di/dt = 100A/µs
Reverse Recovery Charge	Q _{RR}	—	149	—	nC	I _F = 1.0A, di/dt = 100A/µs

- Notes:
- Device mounted on FR-4 PCB, with minimum recommended pad layout.
 - Device mounted on 1" × 1" FR-4 PCB with high-coverage 2oz. copper, single sided.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

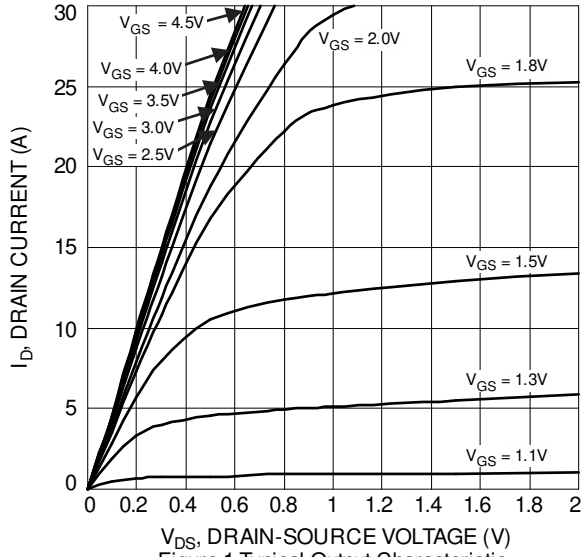


Figure 1 Typical Output Characteristic

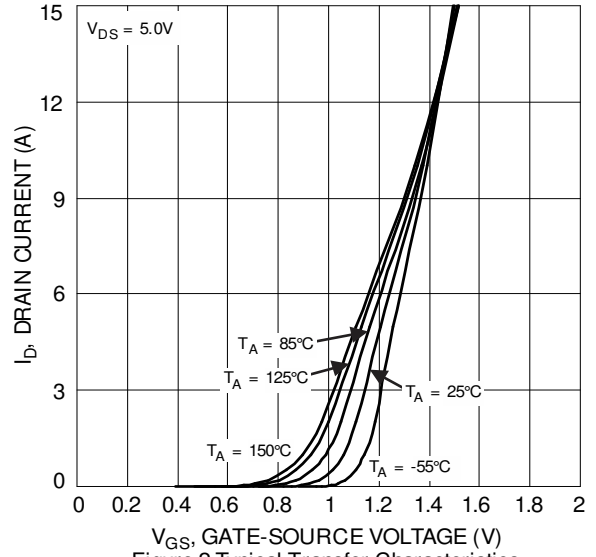


Figure 2 Typical Transfer Characteristics

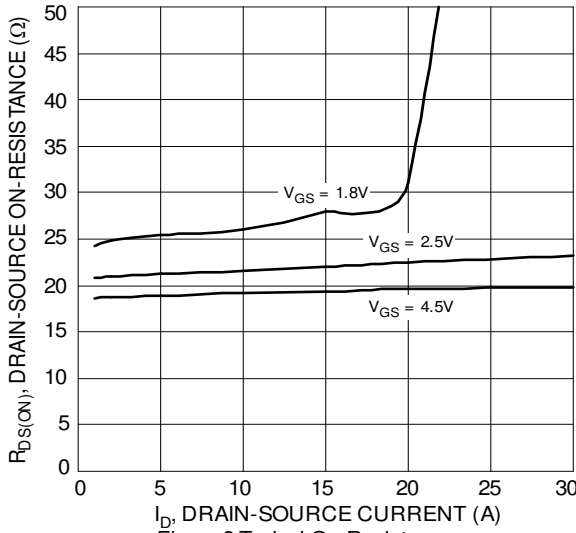


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

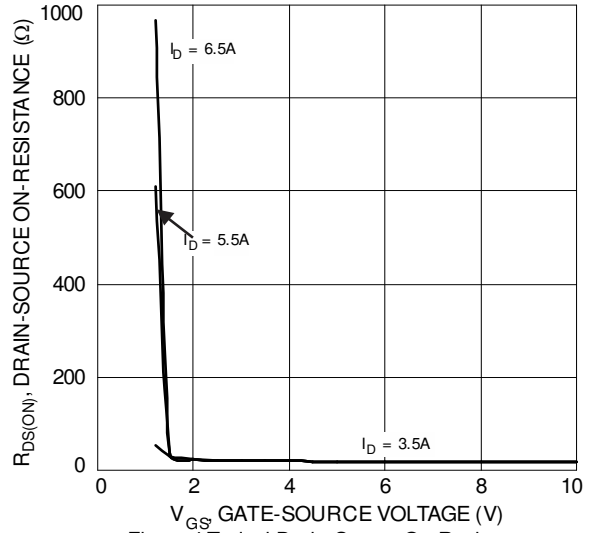


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

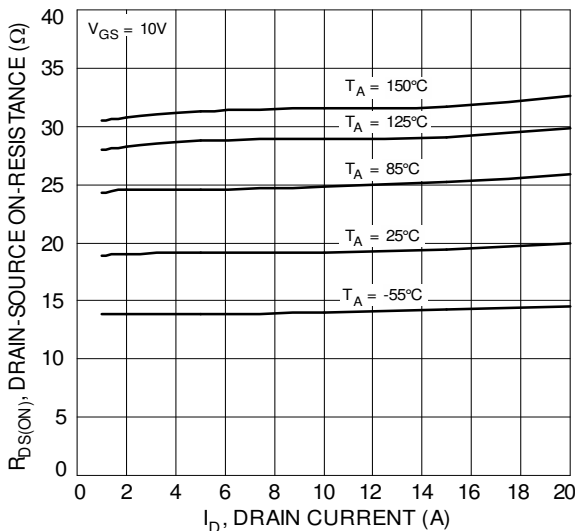


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

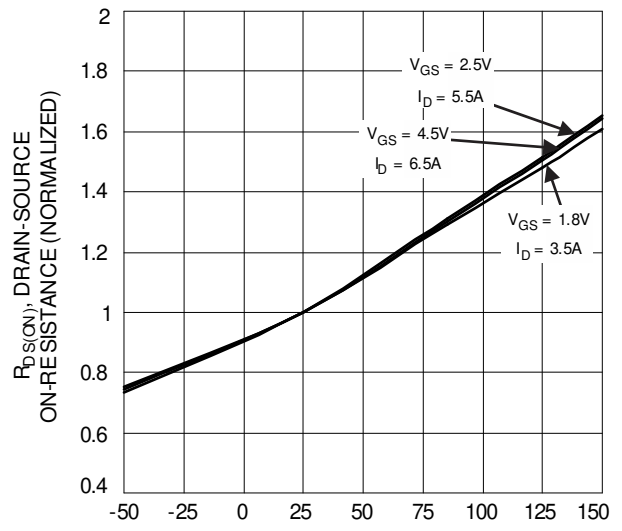


Figure 6 On-Resistance Variation with Temperature

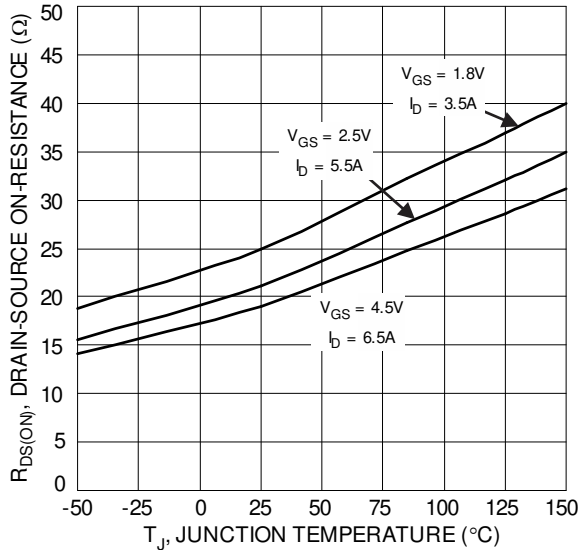


Figure 7 On-Resistance Variation with Temperature

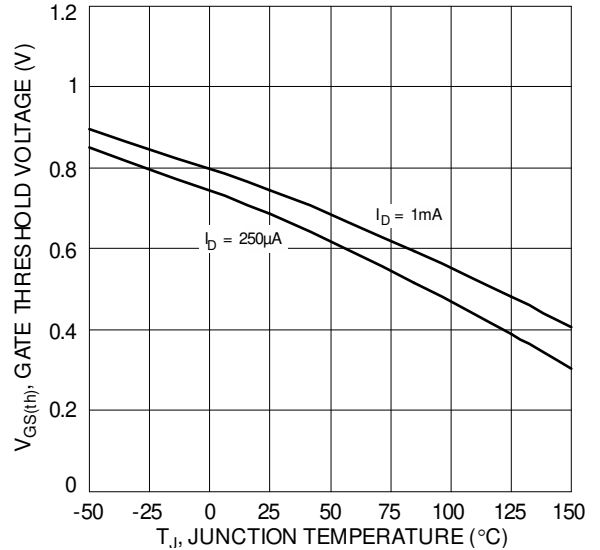


Figure 8 Gate Threshold Variation vs. Junction Temperature

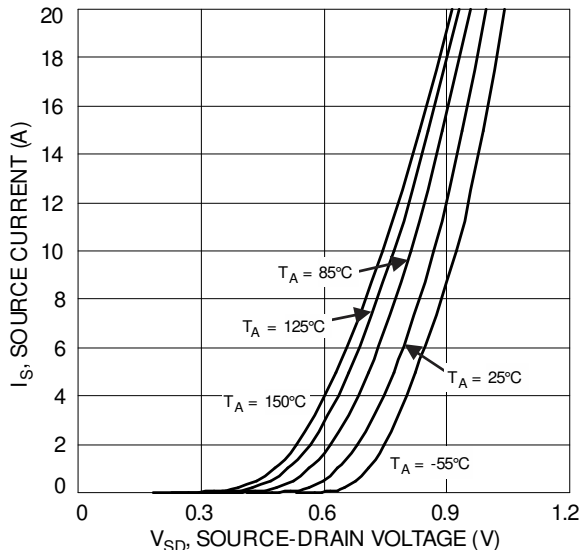


Figure 9 Diode Forward Voltage vs. Current

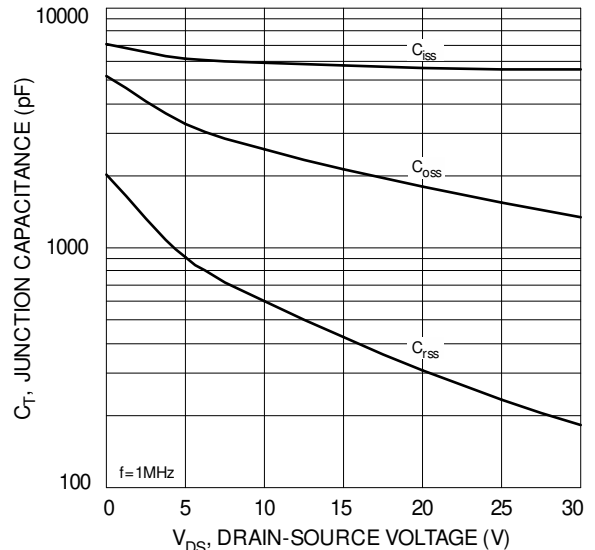


Figure 10 Typical Junction Capacitance

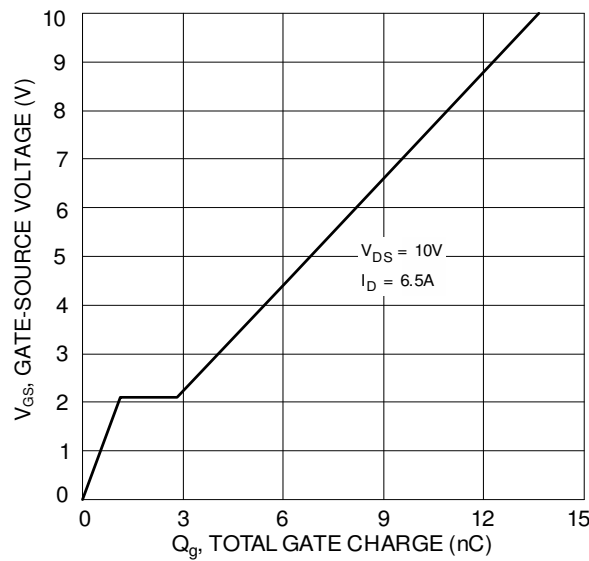


Figure 11 Gate Charge

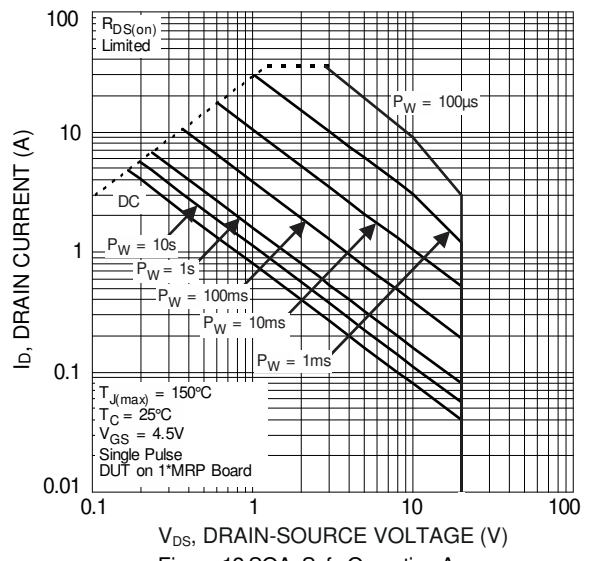
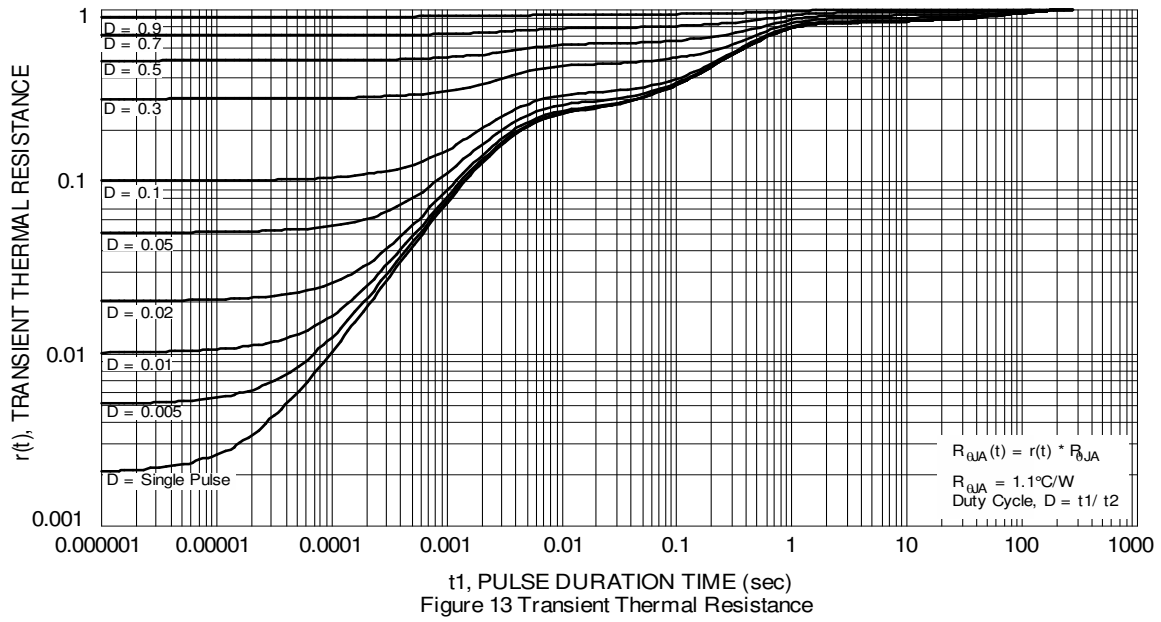


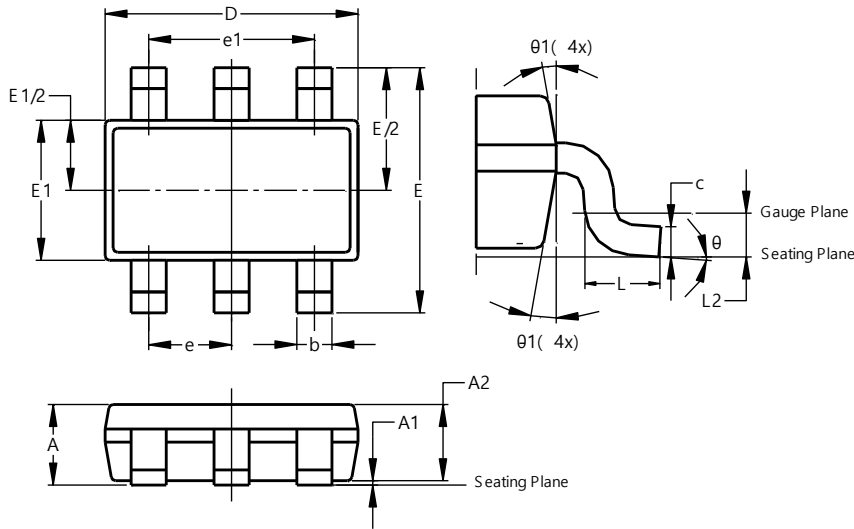
Figure 12 SOA, Safe Operation Area



Package Outline Dimensions

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

TSOT26

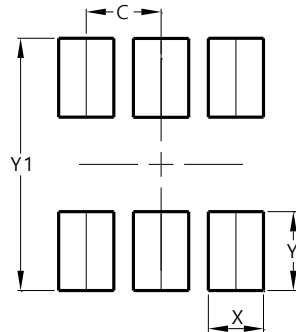


TSOT26			
Dim	Min	Max	Typ
A	–	1.00	–
A1	0.010	0.100	–
A2	0.840	0.900	–
D	2.800	3.000	2.900
E	2.800 BSC		
E1	1.500	1.700	1.600
b	0.300	0.450	–
c	0.120	0.200	–
e	0.950 BSC		
e1	1.900 BSC		
L	0.30	0.50	–
L2	0.250 BSC		
θ	0°	8°	4°
θ1	4°	12°	–
All Dimensions in mm			

Suggested Pad Layout

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

TSOT26



Dimensions	Value (in mm)
C	0.950
X	0.700
Y	1.000
Y1	3.200

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