

Product Summary

BV_{DSS}	$R_{DS(ON)}$ Max	I_D $T_C = +25^\circ C$
700V	1.3Ω @ $V_{GS} = 10V$	4.6A

Description and Applications


This MOSFET is designed to minimize the on-state resistance ($R_{DS(ON)}$), yet maintain superior switching performance, making it ideal for high-efficiency power management applications.

- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

Features and Benefits

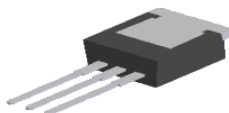
- Low On-Resistance
- High BV_{DSS} Rating for Power Application
- Low Input Capacitance
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

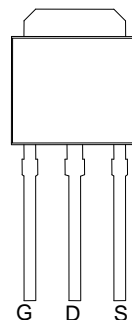
- Case: TO251
- Case Material: Molded Plastic, "Green" Molding Compound.
UL Flammability Classification Rating 94V-0
- Terminal Connections: See Diagram
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe.
Solderable per MIL-STD-202, Method 208 
- Weight: 0.33 grams (Approximate)



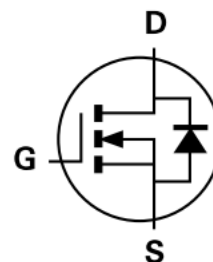
TO251
Top View



TO251
Bottom View



Top View
Pin Configuration



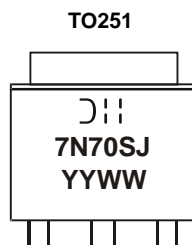
Internal Schematic


Ordering Information (Note 4)

Part Number	Case	Packaging
DMJ70H1D3SJ3	TO251	75 Pieces/Tube

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 2. See 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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



 = Manufacturer's Marking
 7N70SJ = Product Type Marking Code
 YYWW = Date Code Marking
 YY or YY = Last Digit of Year (ex: 16 = 2016)
 WW or WW = Week Code (01 to 53)

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Units
Drain-Source Voltage	V _{DSS}	700	V
Gate-Source Voltage	V _{GSS}	±30	V
Continuous Drain Current (Note 5) V _{GS} = 10V	I _D	4.6 2.9	A
Maximum Body Diode Forward Current (Note 6)	I _S	3.0	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)	I _{DM}	5.4	A
Avalanche Current (Note 7)	I _{AS}	1.1	A
Avalanche Energy (Note 7)	E _{AS}	40	mJ
Peak Diode Recovery dv/dt (Note 7)	dv/dt	5	V/ns

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

Characteristic	Symbol	Value	Units
Total Power Dissipation (Note 5)	P _D	41 16	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{ΘJA}	79	°C/W
Thermal Resistance, Junction to Case (Note 5)	R _{ΘJC}	3.0	°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 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	700	—	—	V	V _{GS} = 0V, I _D = 250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 700V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	100	nA	V _{GS} = ±30V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	2	2.9	4	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	1.0	1.3	Ω	V _{GS} = 10V, I _D = 2.5A
Diode Forward Voltage	V _{SD}	—	0.9	1.3	V	V _{GS} = 0V, I _S = 5A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{ISS}	—	351	—	pF	V _{DS} = 50V, f = 1MHz, V _{GS} = 0V
Output Capacitance	C _{OSS}	—	66	—		
Reverse Transfer Capacitance	C _{RSS}	—	1.1	—		
Gate Resistance	R _G	—	3.5	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge	Q _G	—	13.9	—	nC	V _{DD} = 560V, I _D = 5A, V _{GS} = 10V
Gate-Source Charge	Q _{GS}	—	1.9	—		
Gate-Drain Charge	Q _{GD}	—	8.5	—		
Turn-On Delay Time	t _{D(ON)}	—	8.5	—	ns	V _{DD} = 350V, V _{GS} = 10V, R _G = 4.7Ω, I _D = 2.5A
Turn-On Rise Time	t _R	—	11.6	—		
Turn-Off Delay Time	t _{D(OFF)}	—	24.5	—		
Turn-Off Fall Time	t _F	—	10	—		
Body Diode Reverse Recovery Time	t _{RR}	—	212	—	ns	I _S = 5A, dI/dt = 100A/µs
Body Diode Reverse Recovery Time (T _J = +150°C)	t _{RR}	—	251	—	ns	
Body Diode Reverse Recovery Charge	Q _{RR}	—	1.8	—	µC	
Body Diode Reverse Recovery Charge (T _J = +150°C)	Q _{RR}	—	2.3	—	µC	

- Notes:
- Device mounted on infinite heatsink.
 - Device mounted on FR-4 substrate PC board, 2oz. copper, with minimum recommended pad layout.
 - Guaranteed by design. Not subject to production testing.
 - Short duration pulse test used to minimize self-heating effect.

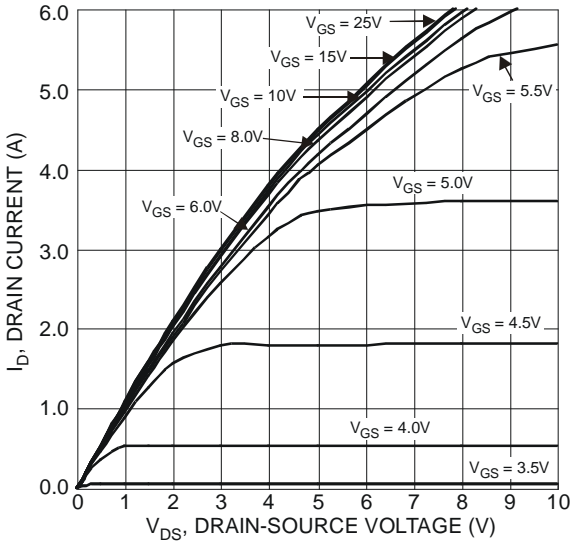


Figure 1 Typical Output Characteristics

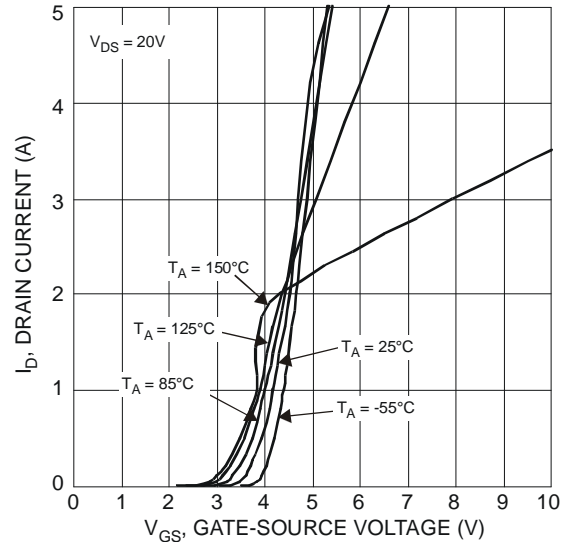


Figure 2 Typical Transfer Characteristics

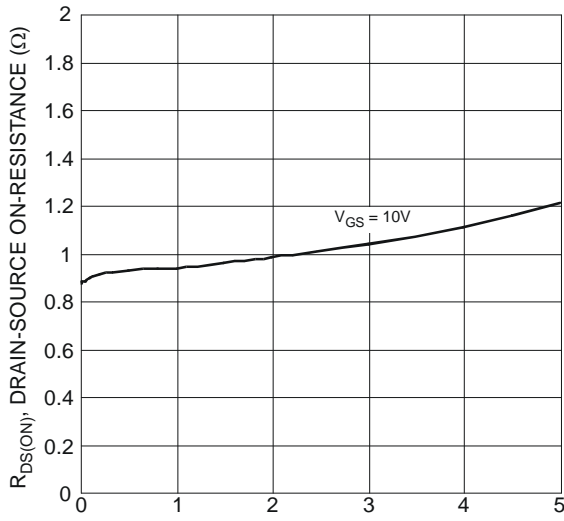


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

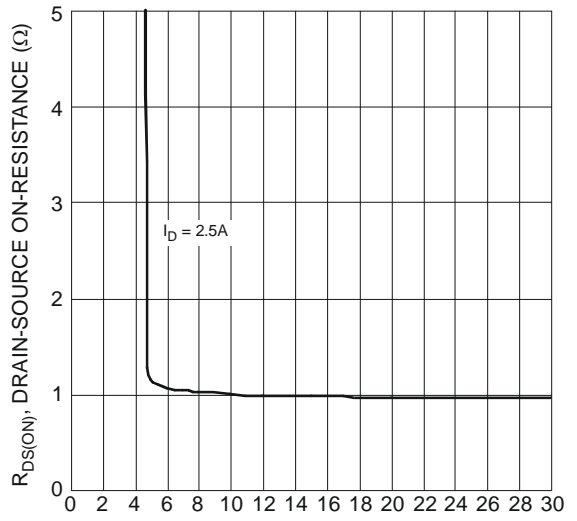


Figure 4 Typical Transfer Characteristics

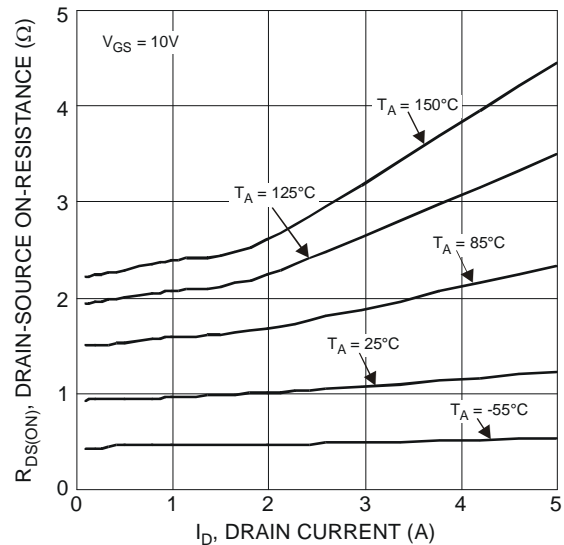


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

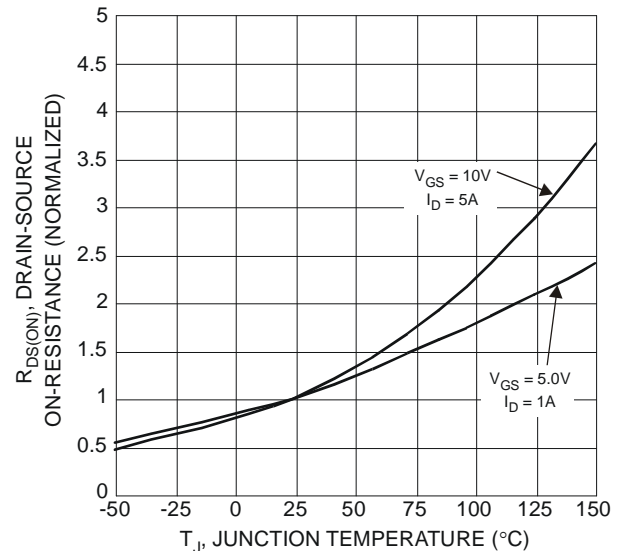
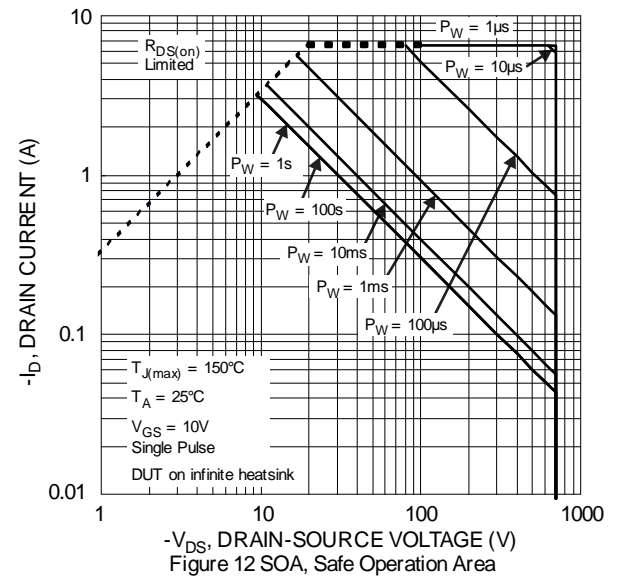
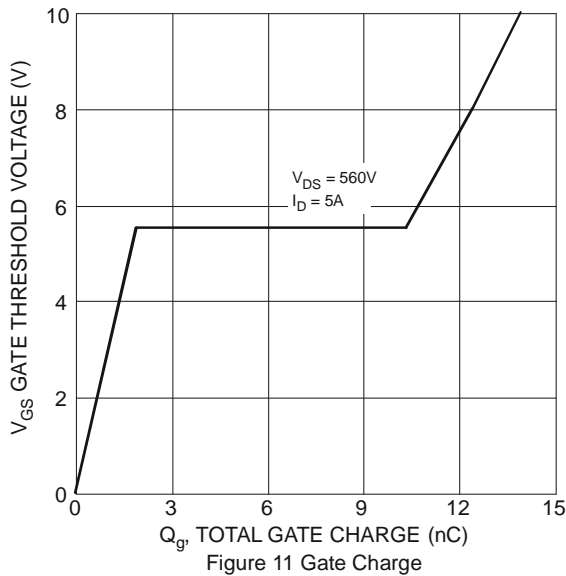
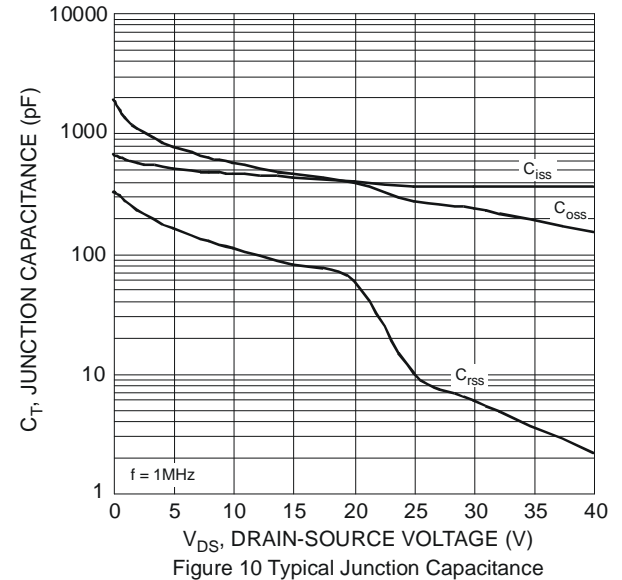
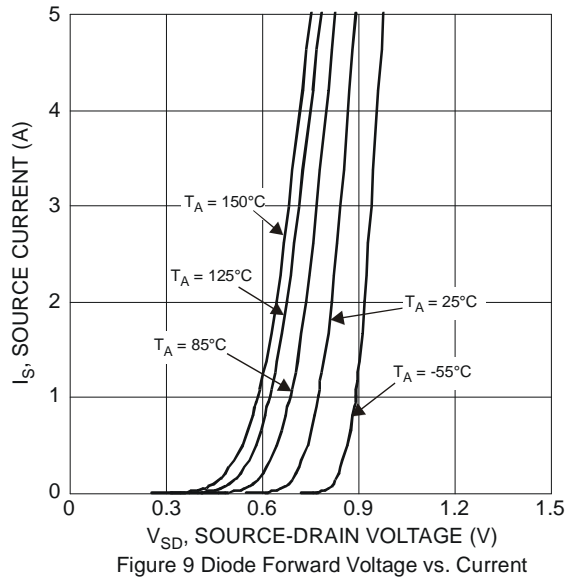
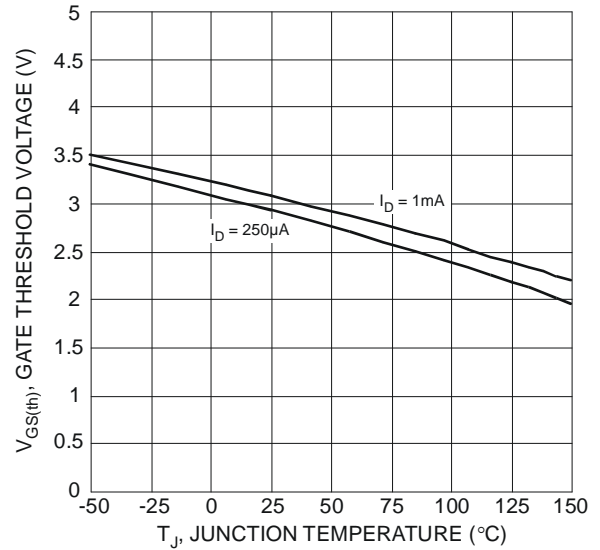
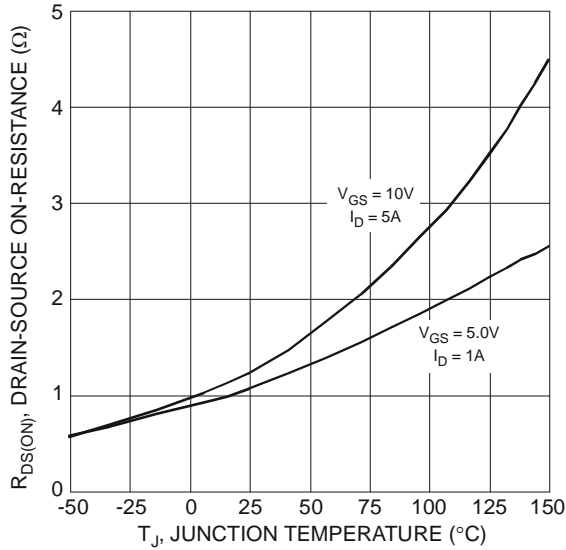
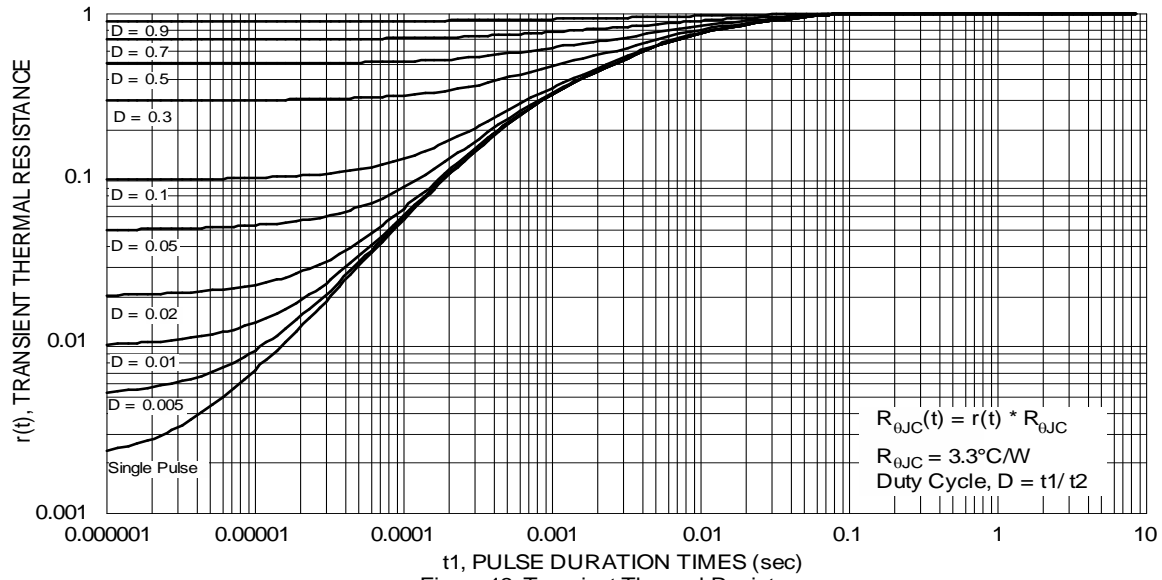


Figure 6 On-Resistance Variation with Temperature

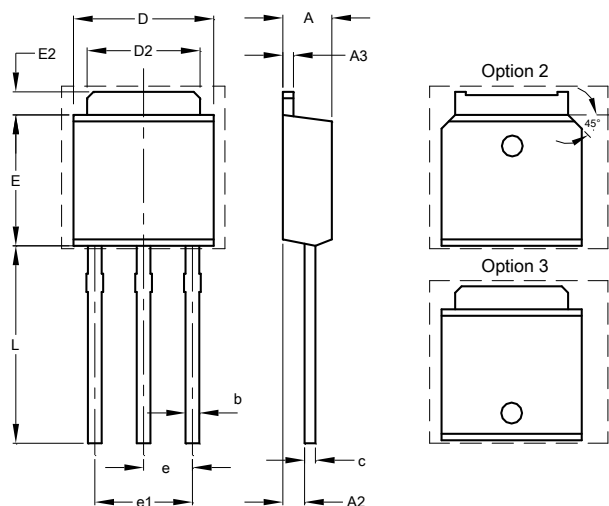




Package Outline Dimensions

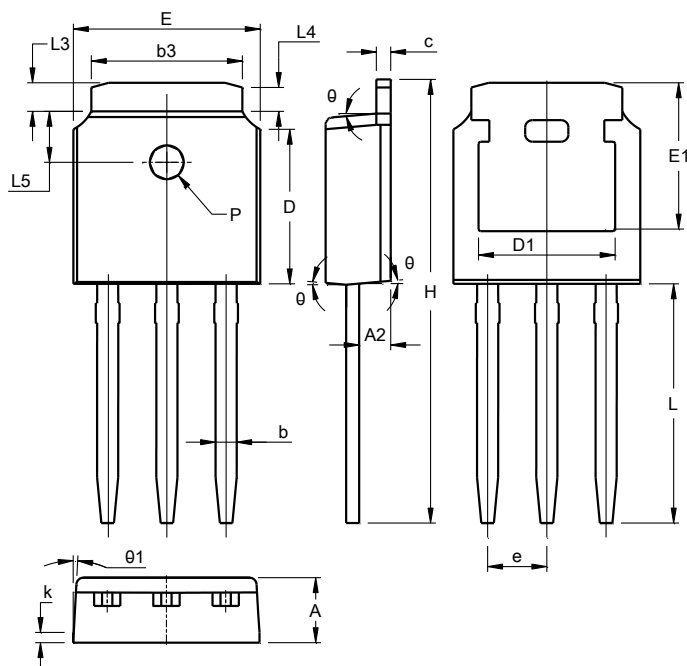
Please see AP02001 at http://www.diodes.com/_files/datasheets/ap02001.pdf for the latest version.

TO251



TO251		
Dim	Min	Max
A	2.200	2.400
A2	0.890	1.150
A3	0.450	0.550
B	0.550	0.740
C	0.450	0.570
D	6.400	6.750
D2	5.200	5.400
E	5.950	6.250
E2	0.900	1.250
E	2.240	2.340
e1	4.430	4.730
L	8.900	9.500
All Dimensions in mm		

TO251 (Type TH)



TO251 (Type TH)			
Dim	Min	Max	Typ
A	2.20	2.40	2.30
A2	0.97	1.17	1.07
b	0.68	0.90	0.78
b3	5.20	5.50	5.33
c	0.43	0.63	0.53
D	5.98	6.22	6.10
D1	5.30 REF		
e	2.286 BSC		
E	6.40	6.80	6.60
E1	4.63	5.03	4.83
H	16.22	16.82	16.52
k	0.40REF		
L	9.15	9.65	9.40
L3	0.88	1.28	1.02
L4	0.75 REF		
L5	1.65	1.95	1.80
PØ	1.20		
θ	5°	9°	7°
θ1	5°	9°	7°
All Dimensions in mm			

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