

Product Summary

BV _{DSS} (@ T _J Max)	R _{Ds(ON)} Max	I _D @T _C = +25°C
650V	3.5Ω @ V _{GS} = 10V	2.8A

Description and Applications

This new generation 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.

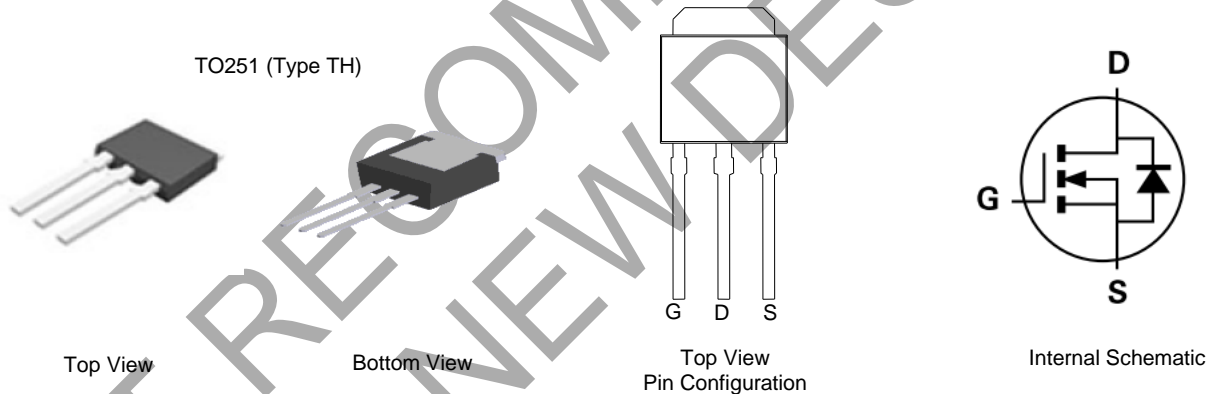
- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

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)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

Mechanical Data

- Package: TO251
- Package 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: 0.33 grams (Approximate)

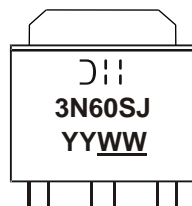


Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
DMG3N60SJ3	TO251 (Type TH)	75 Pieces	Tube

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
 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



= Manufacturer's Marking
 3N60SJ = Product Type Marking Code
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 21 = 2021)
 WW = Week Code (01 to 53)

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

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	600	V
Gate-Source Voltage			V _{GSS}	±30	V
Continuous Drain Current (Note 5) V _{GS} = 10V	Steady State	T _C = +25°C	I _D	2.8	A
		T _C = +100°C		1.8	
Continuous Drain Current (Note 5) V _{GS} = 10V	Steady State	T _A = +25°C	I _D	0.7	A
Maximum Body Diode Forward Current (Note 5)			I _S	2.5	A
Pulsed Drain Current (10µs Pulse, Duty Cycle = 1%)			I _{DM}	4.2	A
Avalanche Current, L = 60mH (Note 7)			I _{AS}	1.0	A
Avalanche Energy, L = 60mH (Note 7)			E _{AS}	33	mJ
Peak Diode Recovery dv/dt			dv/dt	5	V/ns

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

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T _C = +25°C	P _D	41	W
	T _C = +100°C		16	
Total Power Dissipation (Note 5)	T _A = +25°C	P _D	2.5	W
Thermal Resistance, Junction to Ambient (Note 6)		R _{θJA}	49	°C/W
Thermal Resistance, Junction to Case (Note 5)		R _{θJC}	3.0	
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}	600	—	—	V	V _{GS} = 0V, I _D = 250µA
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 600V, 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)}	2.0	3.0	4.0	V	V _{DS} = V _{GS} , I _D = 250µA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	2.9	3.5	Ω	V _{GS} = 10V, I _D = 1.5A
Diode Forward Voltage	V _{SD}	—	0.87	1.5	V	V _{GS} = 0V, I _S = 3.0A
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{iss}	—	354	—	pF	V _{DS} = 25V, f = 1.0MHz, V _{GS} = 0V
Output Capacitance	C _{oss}	—	41	—		
Reverse Transfer Capacitance	C _{rss}	—	4	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1.0MHz
Gate Resistance	R _G	—	2.6	—		
Total Gate Charge	Q _G	—	12.6	—	nC	V _{DD} = 480V, I _D = 2.5A, V _{GS} = 10V
Gate-Source Charge	Q _{GS}	—	1.7	—		
Gate-Drain Charge	Q _{GD}	—	7.1	—		
Turn-On Delay Time	t _{D(ON)}	—	10.6	—	ns	V _{DD} = 300V, R _G = 25Ω, I _D = 2.5A, V _{GS} = 10V
Turn-On Rise Time	t _R	—	22	—		
Turn-Off Delay Time	t _{D(OFF)}	—	34	—		
Turn-Off Fall Time	t _F	—	28	—		
Body Diode Reverse Recovery Time	t _{RR}	—	198	—	ns	dI/dt = 100A/µs, V _{DS} = 100V, I _F = 2.5A
Body Diode Reverse Recovery Charge	Q _{RR}	—	952	—		

- Notes:
- Device mounted on infinite heatsink.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
 - Guaranteed by design. Not subject to production testing.
 - Short duration pulse test used to minimize self-heating effect.

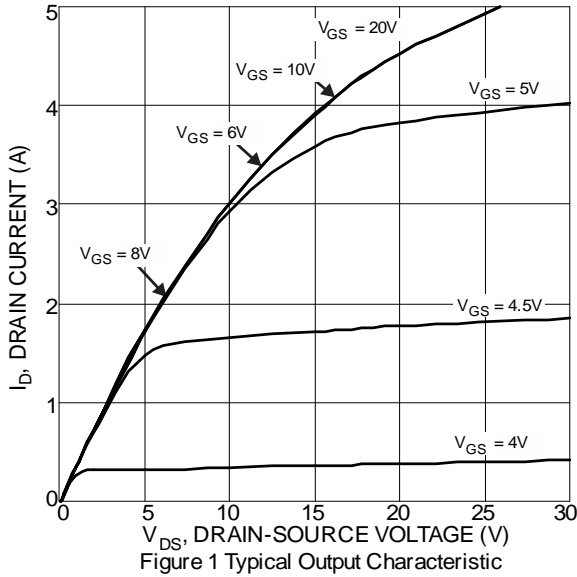


Figure 1 Typical Output Characteristic

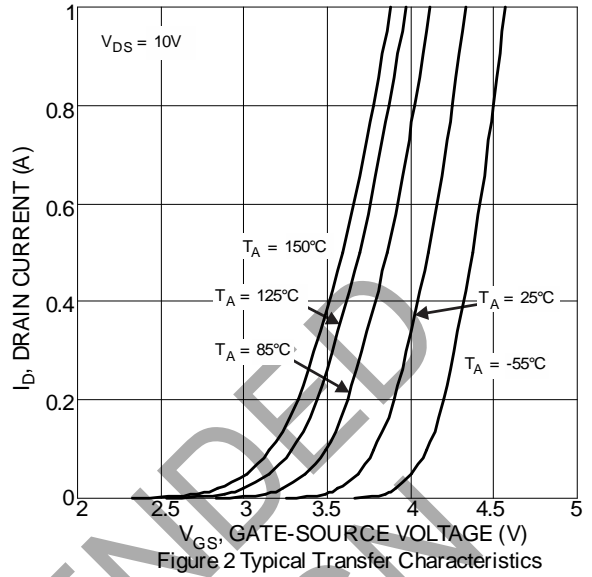


Figure 2 Typical Transfer Characteristics

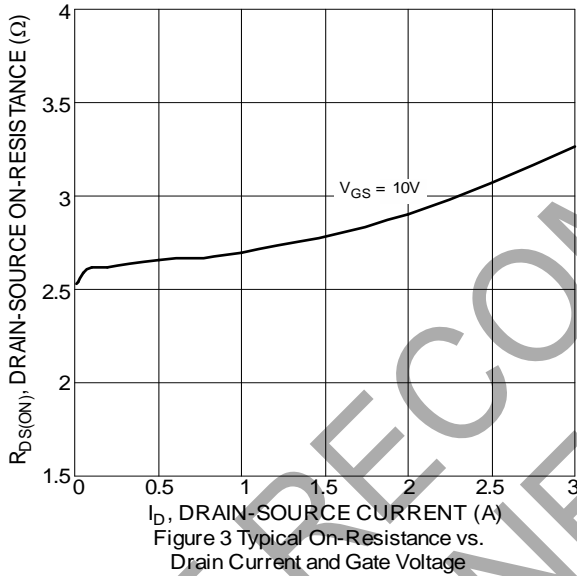


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

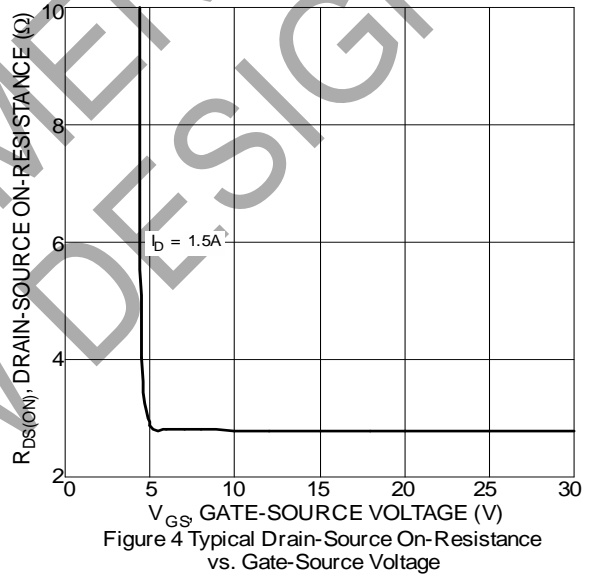


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

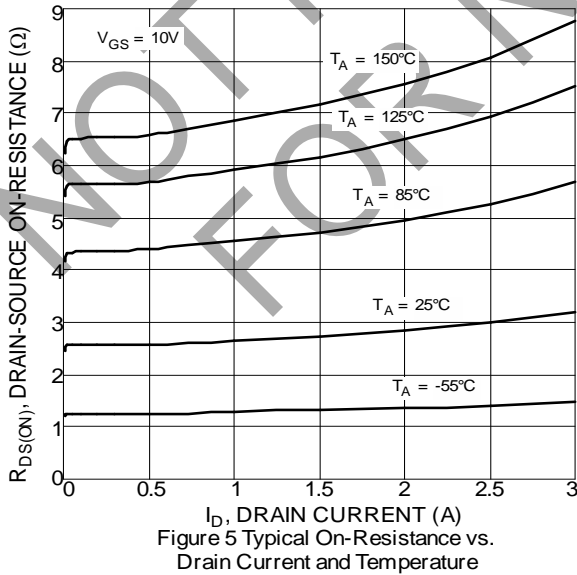


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

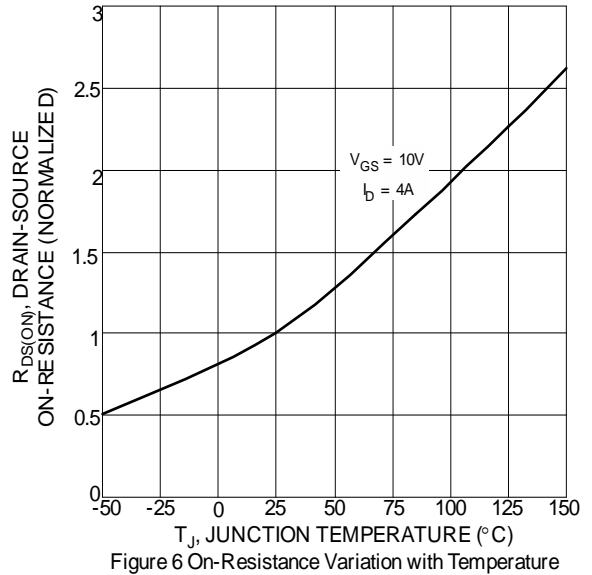


Figure 6 On-Resistance Variation with Temperature

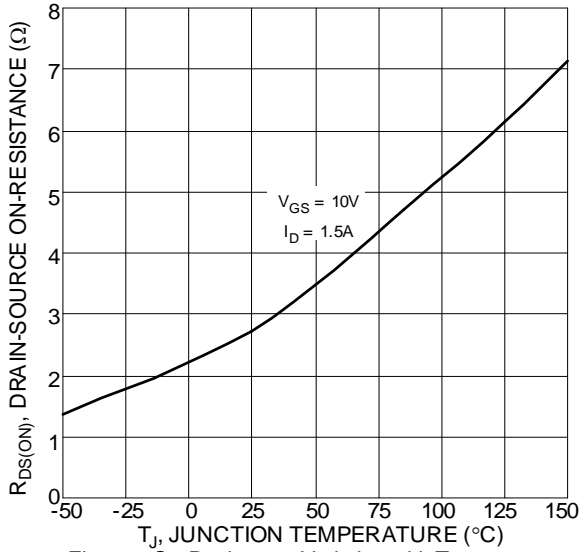


Figure 7 On-Resistance Variation with Temperature

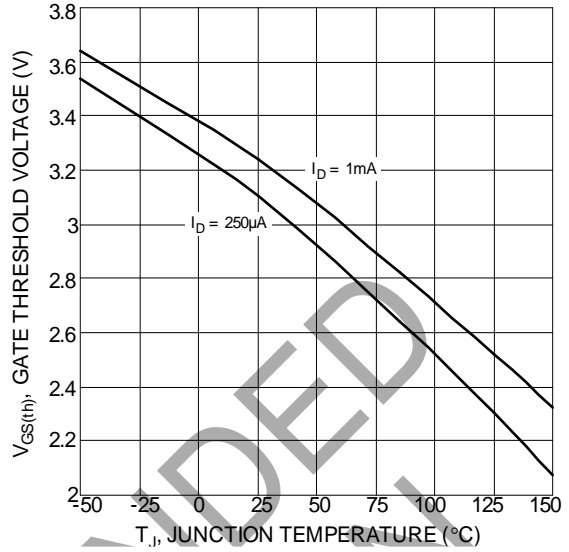


Figure 8 Gate Threshold Variation vs. Junction Temperature

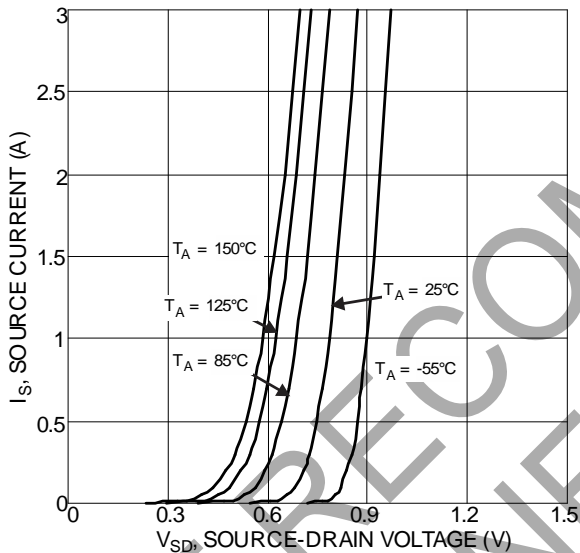


Figure 9 Diode Forward Voltage vs. Current

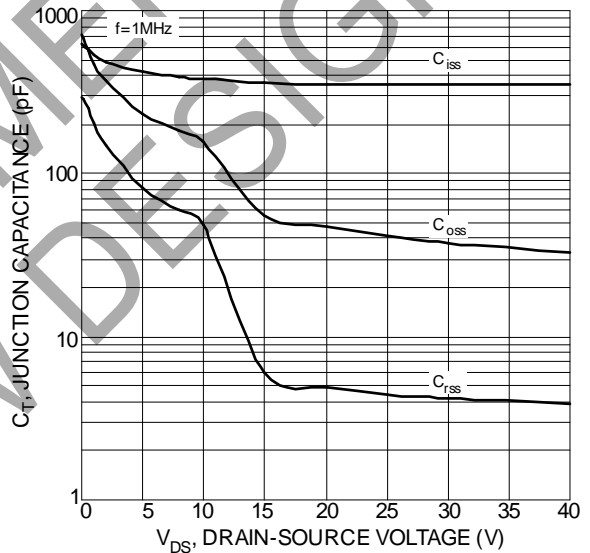


Figure 10 Typical Junction Capacitance

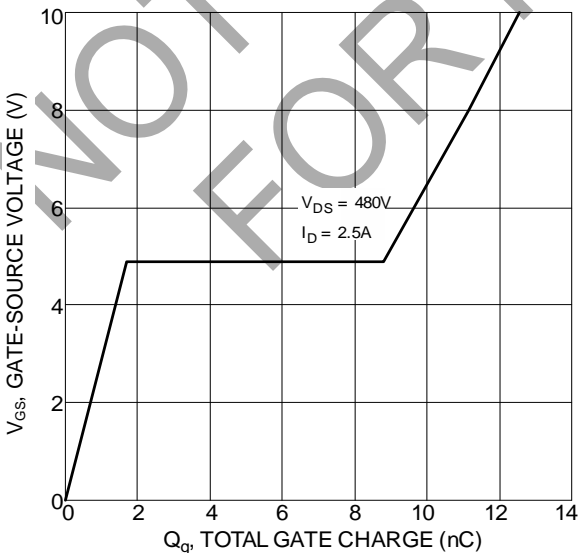


Figure 11 Gate Charge

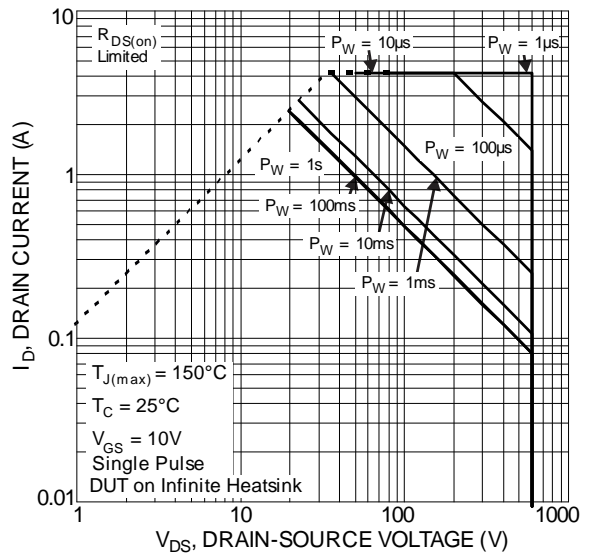
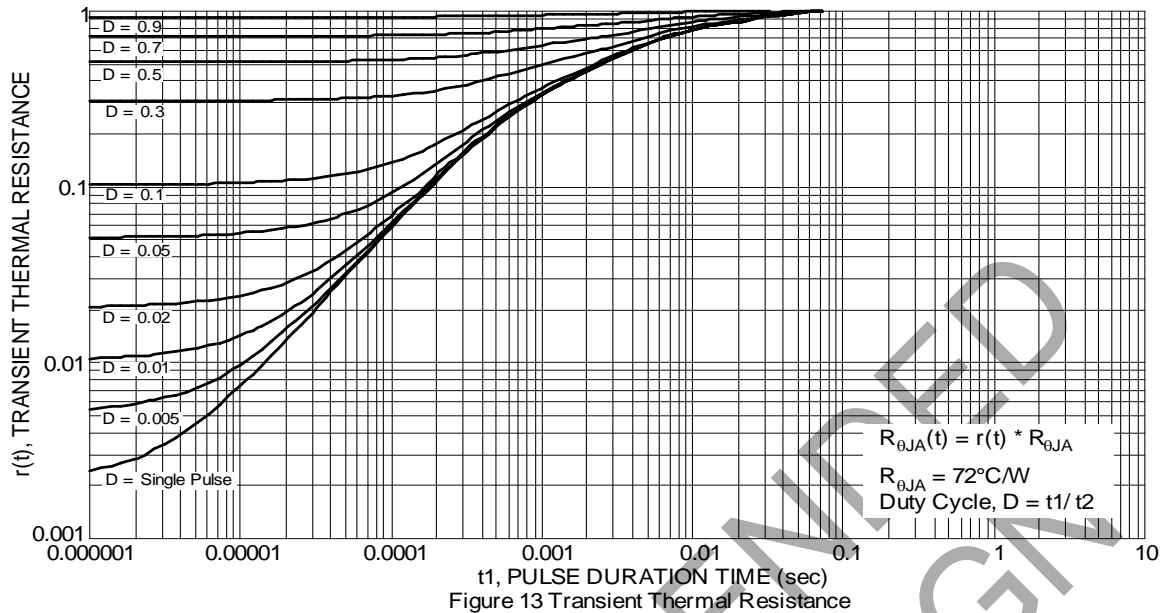


Figure 12 SOA, Safe Operation Area

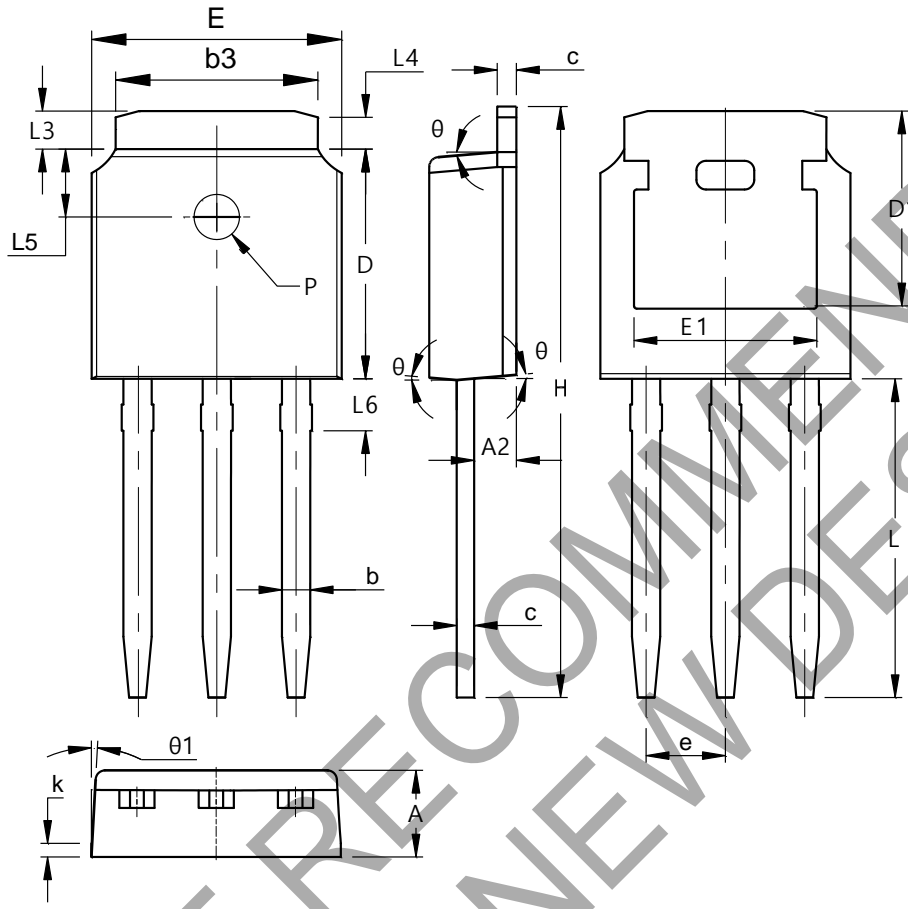


NOT RECOMMENDED FOR NEW DESIGN!

Package Outline Dimensions

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

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	0.40 REF		
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
L6	0.85	1.25	1.05
PØ	1.20		
θ	5°	9°	7°
θ1	5°	9°	7°
All Dimensions in mm			

NOT RECOMMENDED FOR NEW DESIGNS

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