

## Product Summary

$BV_{DSS}$ (@ $T_J$ Max) (Note 7)	$R_{DS(ON)}$	$I_D$ $T_C = +25^\circ C$
1000V	$2.2\Omega @ V_{GS} = 10V$	6A

## Description

This new generation MOSFET features low on-resistance and fast switching, making it ideal for high efficiency power management applications.

## Applications

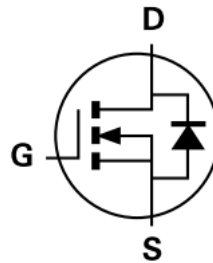
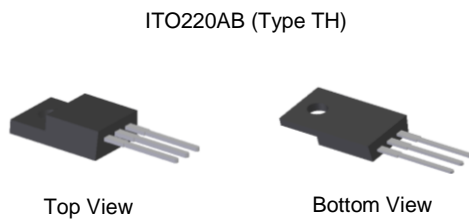
- Motor Control
- Backlighting
- DC-DC Converters
- Power Management Functions

## Features

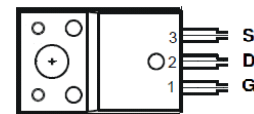
- Low Input Capacitance
- High  $BV_{DSS}$  Rating for Power Application
- Low Input/Output Leakage
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: ITO220AB (Type TH)
- Case Material: Molded Plastic, "Green" Molding Compound, UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Finish Annealed Over Copper Leadframe. Solderable per MIL-STD-202, Method 208  $\text{E3}$
- Terminal Connections: See Diagram Below
- Weight: 1.85 grams (Approximate)



Equivalent Circuit



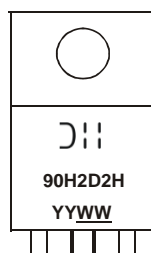
Top View  
Pin Out Configuration

## Ordering Information (Note 4)

Part Number	Case	Packaging
DMN90H2D2HCTI	ITO220AB (Type TH)	50 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](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  
 90H2D2H = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY or YY = Last Two Digits of Year (ex: 16 = 2016)  
 WW or WW = Week Code (01 to 53)

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	900	V
Gate-Source Voltage	V <sub>GSS</sub>	±30	V
Continuous Drain Current (Notes 5) V <sub>GS</sub> = 10V (Note 6)	I <sub>D</sub>	T <sub>C</sub> = +25°C	6
		T <sub>C</sub> = +100°C	4
Pulsed Drain Current	I <sub>DM</sub>	24	A
Avalanche Current, L = 60mH (Note 7)	I <sub>AS</sub>	3.5	A
Avalanche Energy, L = 60mH (Note 7)	E <sub>AS</sub>	360	mJ

**Thermal Characteristics**

Characteristic	Symbol	Max	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	T <sub>C</sub> = +25°C	40
		T <sub>C</sub> = +100°C	14
Thermal Resistance, Junction to Case (Note 5)	R <sub>θJC</sub>	3.6	°C/W
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>	900	—	—	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> = 900V, V <sub>GS</sub> = 0V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	100	nA	V <sub>GS</sub> = ±30V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS (Note 8)</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	3	4	5	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	—	1.7	2.2	Ω	V <sub>GS</sub> = 10V, I <sub>D</sub> = 3A
Diode Forward Voltage	V <sub>SD</sub>	—	0.85	1.2	V	V <sub>GS</sub> = 0V, I <sub>S</sub> = 6A
<b>DYNAMIC CHARACTERISTICS (Note 7)</b>						
Input Capacitance	C <sub>iss</sub>	—	1487	—	pF	V <sub>DS</sub> = 25V, f = 1MHz, V <sub>GS</sub> = 0V
Output Capacitance	C <sub>oss</sub>	—	113	—		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	1	—		
Gate Resistance	R <sub>g</sub>	—	4.7	—	Ω	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz
Total Gate Charge	Q <sub>g</sub>	—	20.3	—	nC	V <sub>DD</sub> = 720V, I <sub>D</sub> = 6A, V <sub>GS</sub> = 10V
Gate-Source Charge	Q <sub>gs</sub>	—	6.4	—		
Gate-Drain Charge	Q <sub>gd</sub>	—	6.1	—		
Turn-On Delay Time	t <sub>D(ON)</sub>	—	39	—	ns	V <sub>DD</sub> = 450V, V <sub>GS</sub> = 10V, R <sub>g</sub> = 25Ω, I <sub>D</sub> = 6A
Turn-On Rise Time	t <sub>r</sub>	—	49	—		
Turn-Off Delay Time	t <sub>D(OFF)</sub>	—	51	—		
Turn-Off Fall Time	t <sub>f</sub>	—	31	—		
Body Diode Reverse Recovery Time	t <sub>RR</sub>	—	607	—	ns	I <sub>F</sub> = 6A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q <sub>RR</sub>	—	8.1	—	μC	

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

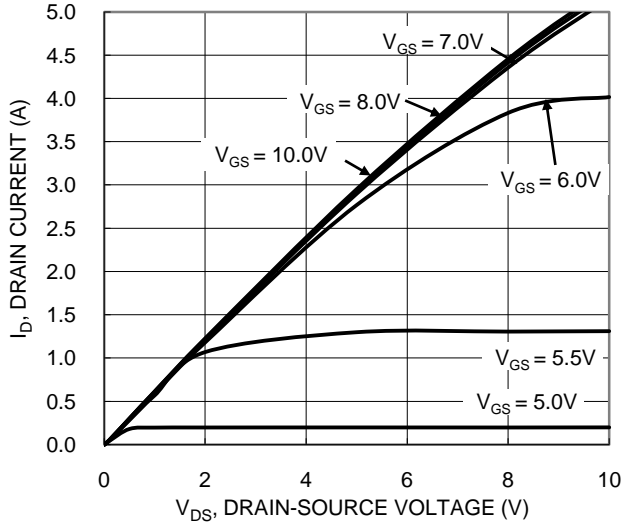


Figure 1. Typical Output Characteristic

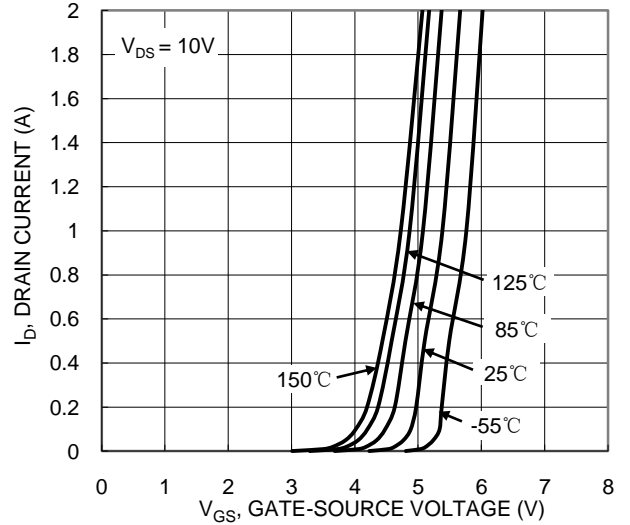


Figure 2. Typical Transfer Characteristic

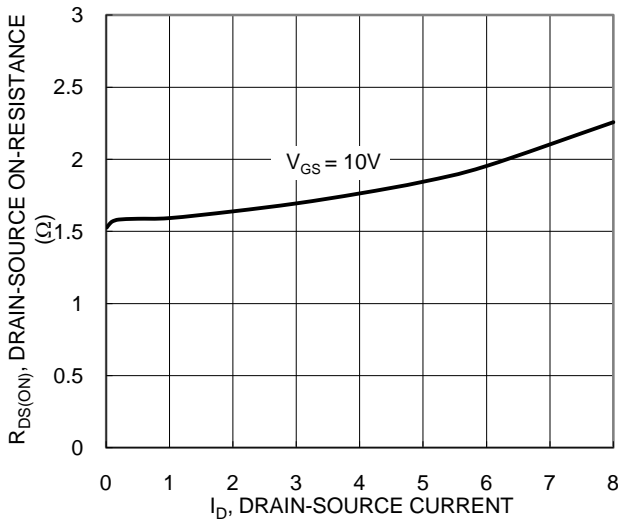


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

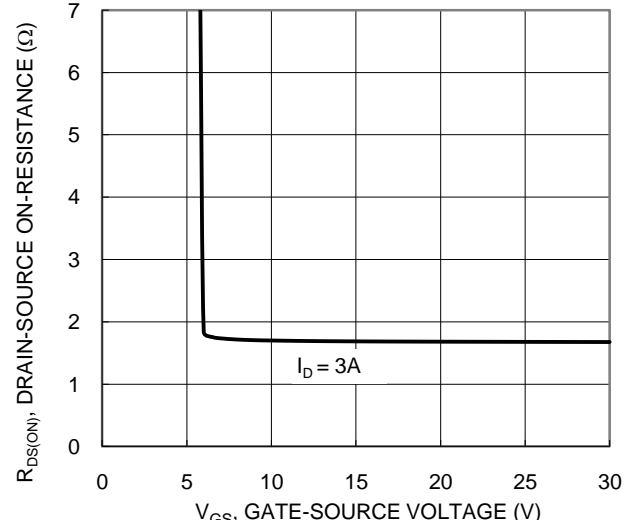


Figure 4. Typical Transfer Characteristic

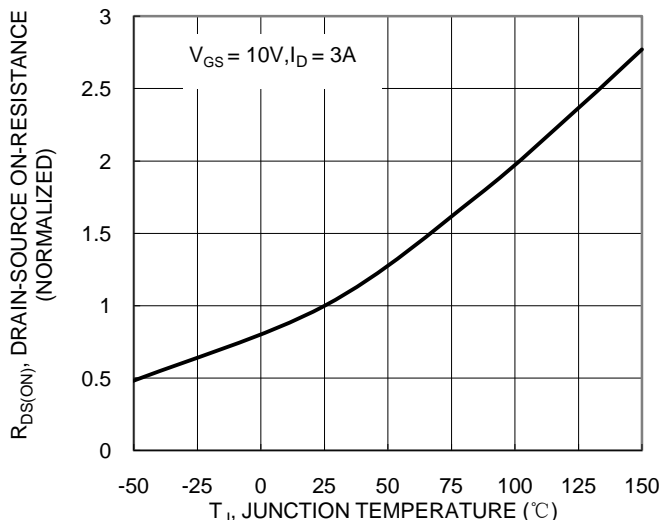


Figure 5. On-Resistance Variation with Junction Temperature

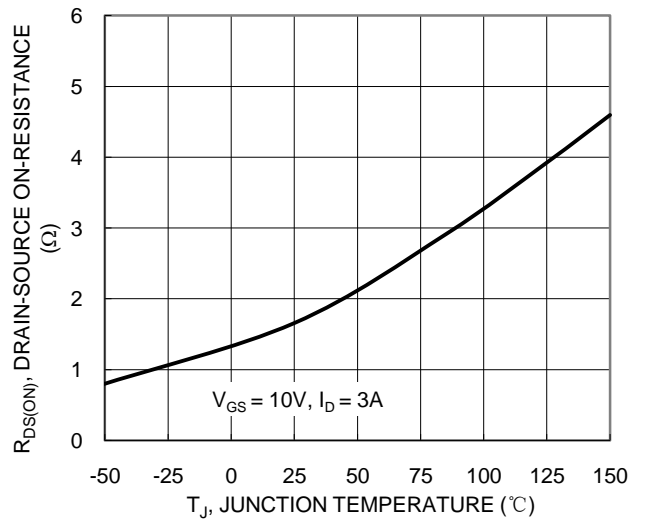


Figure 6. On-Resistance Variation with Junction Temperature

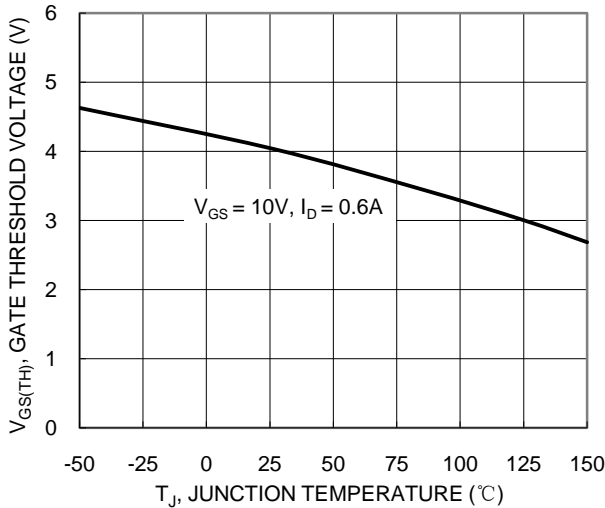


Figure 7. Gate Threshold Variation vs. Junction Temperature

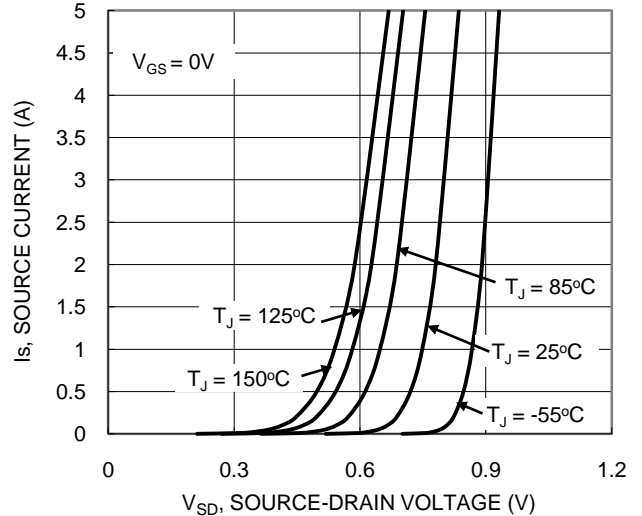


Figure 8. Diode Forward Voltage vs. Current

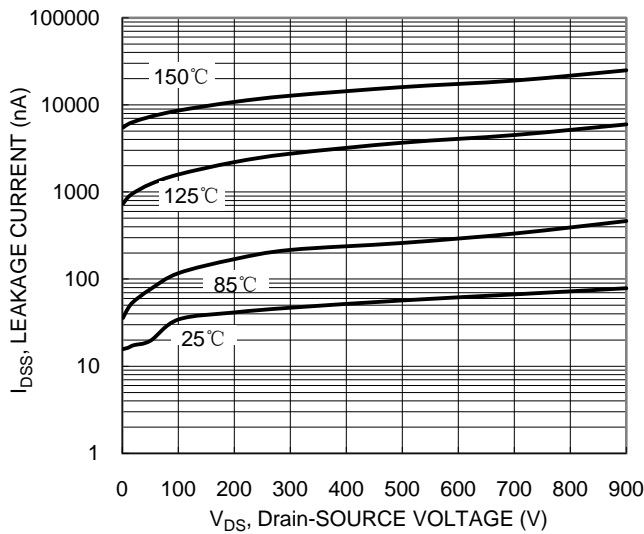


Figure 9. Typical Drain-Source Leakage Current vs. Voltage

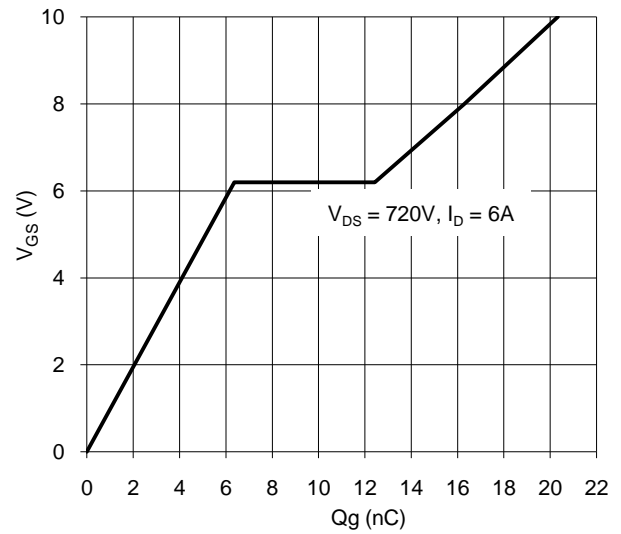


Figure 10. Gate Charge

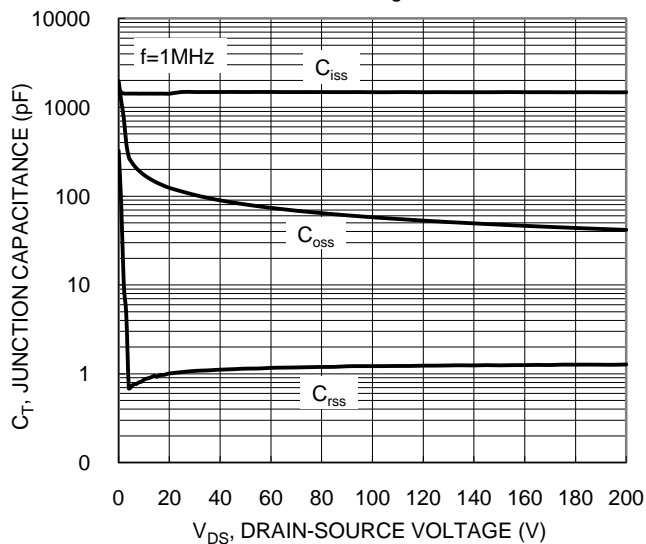


Figure 11. Typical Junction Capacitance

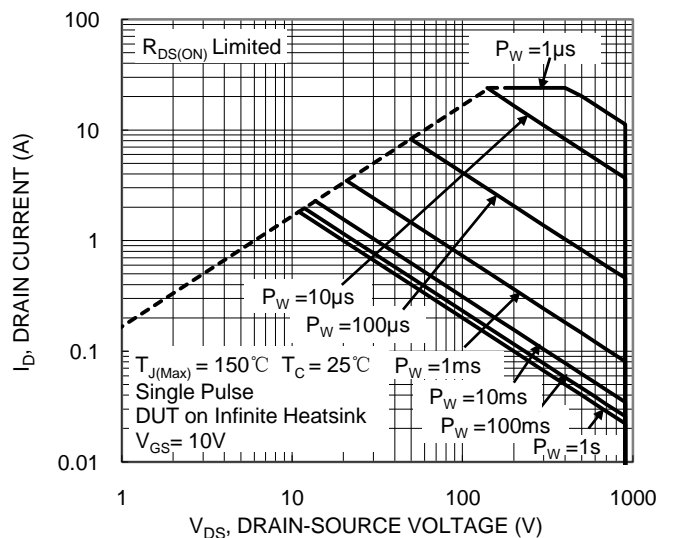


Figure 12. SOA, Safe Operation Area

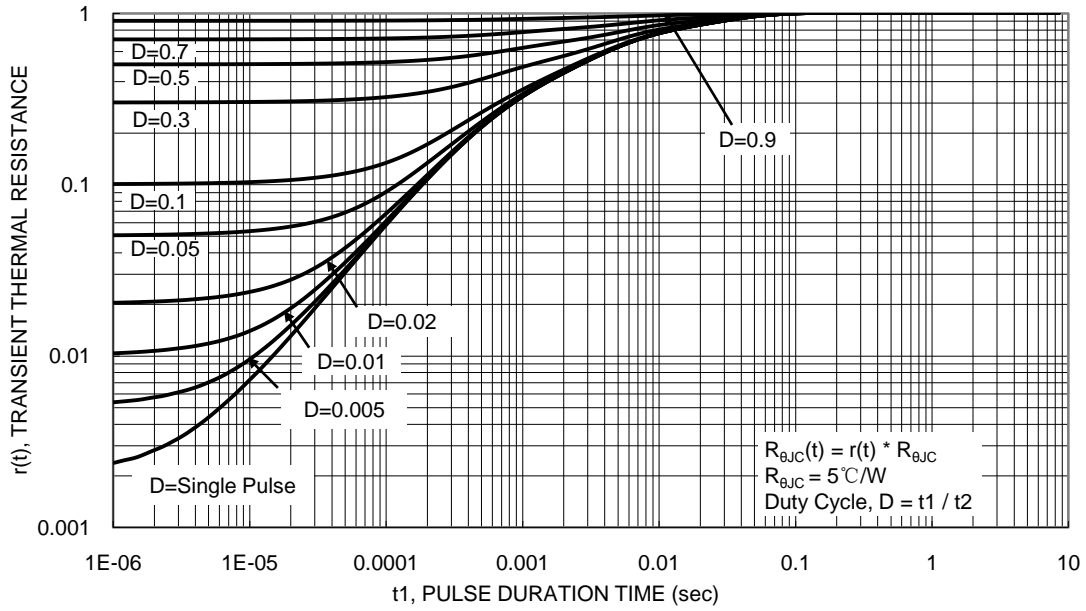
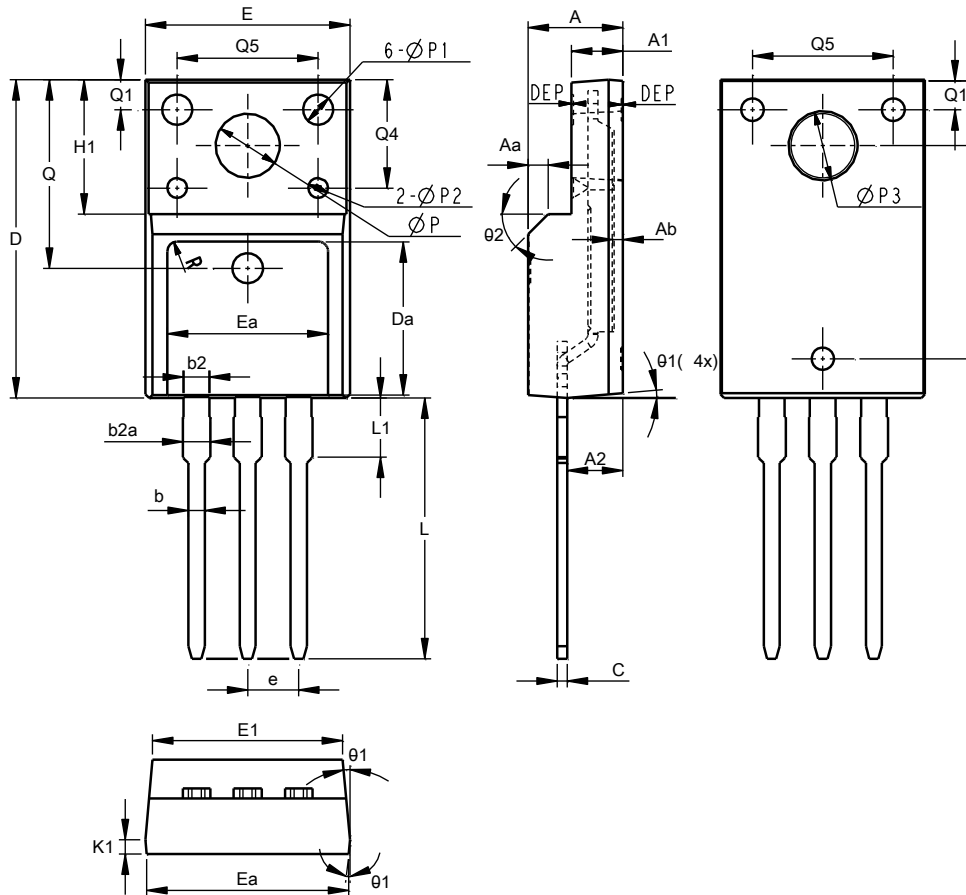


Figure 13. Transient Thermal Resistance

**Package Outline Dimensions**

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

**ITO220AB (Type TH)**



ITO220AB (Type TH)			
Dim	Min	Max	Typ
A	4.50	4.90	4.70
A1	2.34	2.74	2.54
A2	2.63	2.89	2.76
Aa	1.00 REF		
Ab	0.30	0.60	0.56
b	0.75	0.90	0.80
b2	1.23	1.38	1.28
b2a	1.25	1.45	1.35
c	0.45	0.60	0.50
D	15.47	16.27	15.87
Da	7.55	8.05	7.80
e	2.54 BSC		
E	9.86	10.46	10.16
E1	9.26	9.66	9.46
Ea	7.70	8.30	8.00
Eb	9.76	10.34	10.04
H1	6.70 REF		
L	12.58	13.38	12.98
L1	2.81	3.05	2.93
K1	0.65	0.75	0.70
Q	9.40 REF		
Q1	1.00	2.00	1.50
Q2	13.50	14.30	13.90
Q3	3.15	3.45	3.30
Q4	5.15	5.65	5.40
Q5	6.70	7.30	7.00
ØP	3.06	3.40	3.18
ØP1	1.40	1.60	1.50
ØP2	0.95	1.05	1.00
ØP3	3.30	3.60	3.45
θ1	3°	7°	5°
θ2	-	45°	-
R	0.50 REF		
DEP	0.05	0.15	0.10
All Dimensions in mm			

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