

Product Summary

BV_{DSS}	$R_{DS(ON)}$	I_D $T_A = +25^\circ C$
60V	85m Ω @ $V_{GS} = 10V$	4.1A
	110m Ω @ $V_{GS} = 4.5V$	3.6A

Description

This new generation MOSFET is 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.

Applications

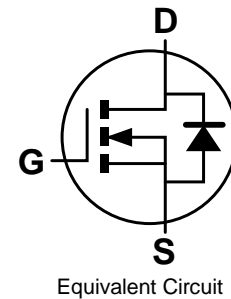
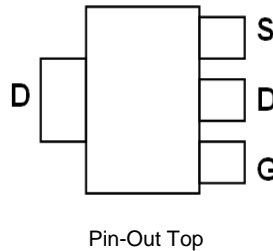
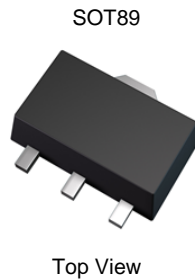
- DC-DC Converters
- Power Management Functions
- Backlighting

Features

- Low Gate Threshold Voltage
- Low Input Capacitance
- Fast Switching Speed
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: SOT89
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Finish Annealed over Copper Lead Frame. Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.052 grams (Approximate)

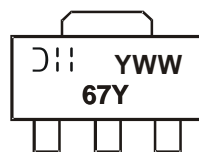


Ordering Information (Note 4)

Part Number	Case	Quantity per Reel
DMN6070SY-13	SOT89	2,500

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 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



D = Manufacturer's Marking
67Y = Product Type Marking Code
YWW = Date Code Marking
Y = Year (ex: 7 = 2017)
WW = Week (01 to 53)

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

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	60	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (Note 6) V _{GS} = 10V	I _D	T _A = +25°C	4.1
		T _A = +70°C	3.3
Pulsed Drain Current (10µs Pulse, Duty Cycle ≤1%)	I _{DM}	15	A
Maximum Body Diode Continuous Current (Note 6)	I _S	2.5	A
Pulsed Body Diode Current (10µs Pulse, Duty Cycle ≤1%)	I _{SM}	15	A
Avalanche Current, L=0.1mH (Note 7)	I _{AS}	11	A
Avalanche Energy, L=0.1mH (Note 7)	E _{AS}	6	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Total Power Dissipation (Note 5)	P _D	0.9	W
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	Steady State	122
		t < 10s	72
Total Power Dissipation (Note 6)	P _D	2.1	W
Thermal Resistance, Junction to Ambient (Note 6)	R _{θJA}	Steady State	58
		t < 10s	34
Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	12	°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}	60	—	—	V	I _D = 250µA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	1	µA	V _{DS} = 60V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±16V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	1.0	—	3.0	V	I _D = 250µA, V _{DS} = V _{GS}
Static Drain-Source On-Resistance	R _{DS(ON)}	—	70	85	mΩ	V _{GS} = 10V, I _D = 2.5A
		—	76	110		V _{GS} = 4.5V, I _D = 1.5A
Diode Forward Voltage	V _{SD}	—	0.75	1.2	V	I _S = 12A, V _{GS} = 0V
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{ISS}	—	588	—	pF	V _{DS} = 30V, V _{GS} = 0V f = 1MHz
Output Capacitance	C _{OSS}	—	26.5	—		
Reverse Transfer Capacitance	C _{RSS}	—	20	—		
Gate Resistance	R _g	—	1.5	—	Ω	V _{GS} = 0V, V _{DS} = 0V, f = 1MHz,
Total Gate Charge (V _{GS} = 4.5V)	Q _g	—	5.6	—	nC	V _{DS} = 30V, I _D = 3A
Total Gate Charge (V _{GS} = 10V)	Q _g	—	12.3	—		
Gate-Source Charge	Q _{gs}	—	1.7	—		
Gate-Drain Charge	Q _{gd}	—	1.9	—		
Turn-On Delay Time	t _{D(ON)}	—	3.5	—	ns	V _{DD} = 30V, V _{GS} = 10V R _L ≅ 50Ω, R _g ≅ 20Ω
Turn-On Rise Time	t _R	—	4.1	—		
Turn-Off Delay Time	t _{D(OFF)}	—	35	—		
Turn-Off Fall Time	t _F	—	11	—		
Body Diode Reverse Recovery Time	t _{RR}	—	18	—	ns	I _S = 12A, di/dt = 100A/µs
Body Diode Reverse Recovery Charge	Q _{RR}	—	12	—	nC	I _S = 12A, di/dt = 100A/µs

- 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 bias to bottom layer 1 inch square copper plate.
 - I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

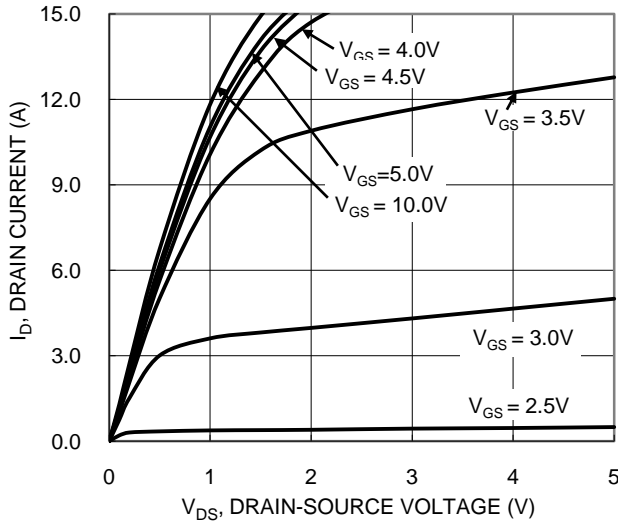


Figure 1. Typical Output Characteristic

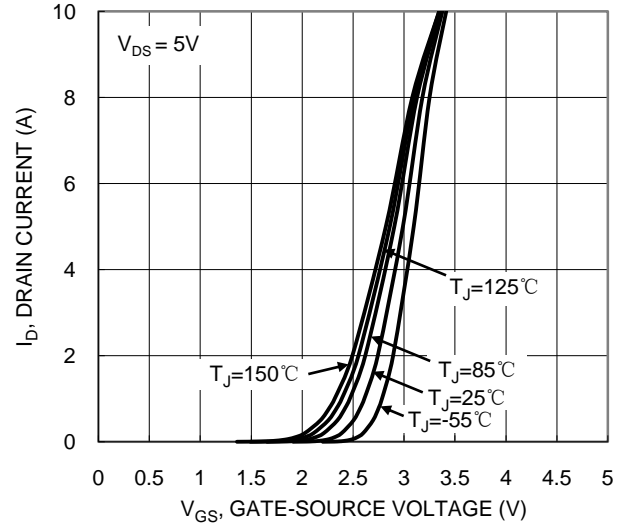


Figure 2. Typical Transfer Characteristic

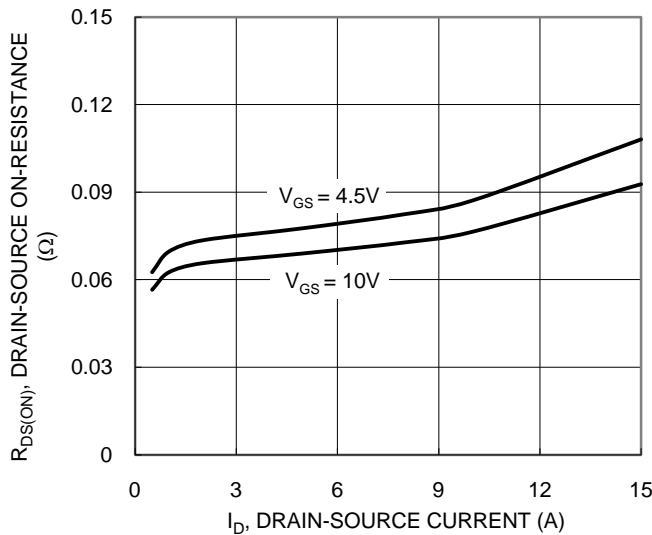


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

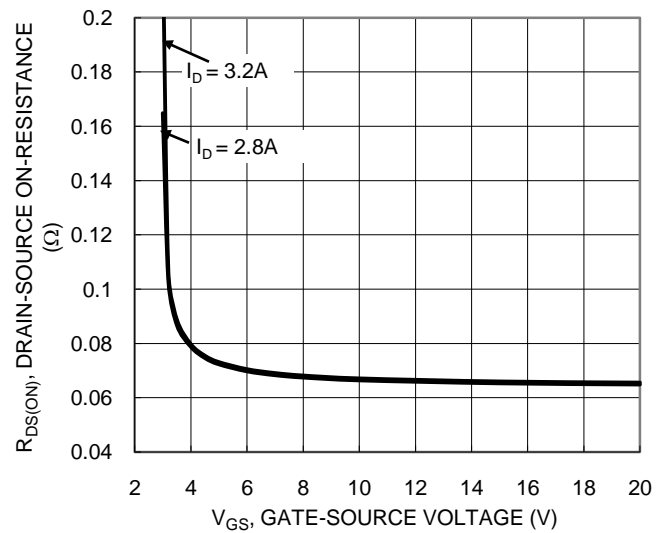


Figure 4. Typical Transfer Characteristic

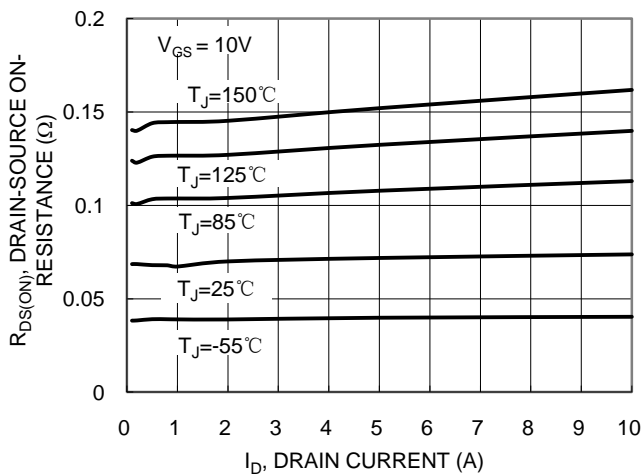


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

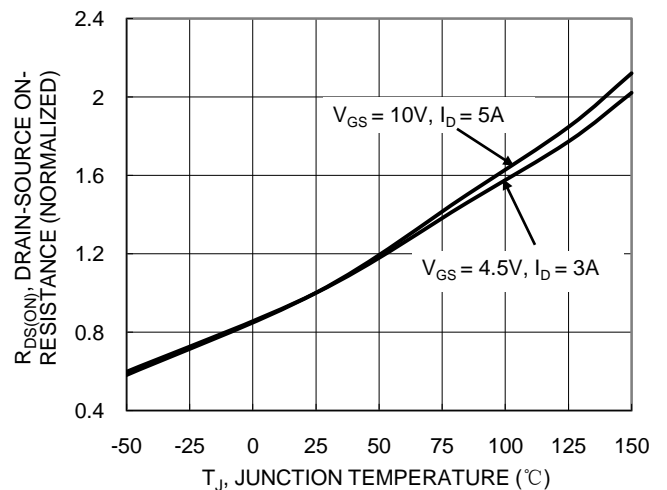
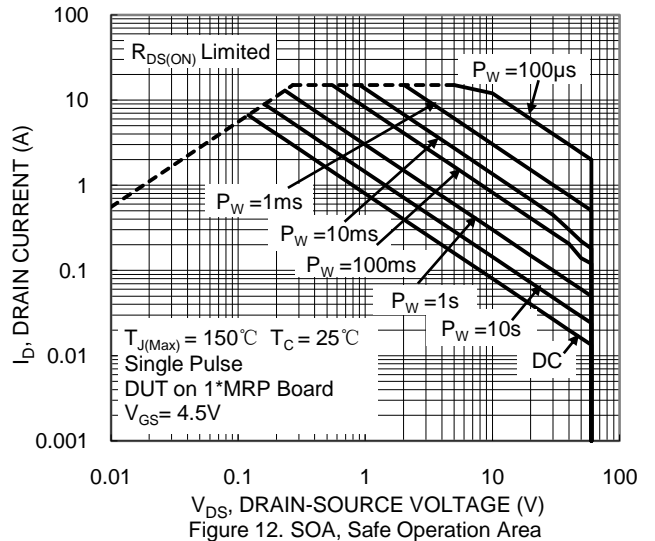
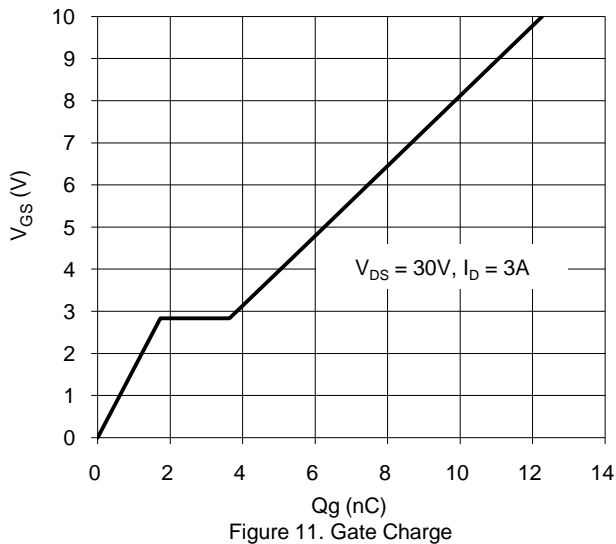
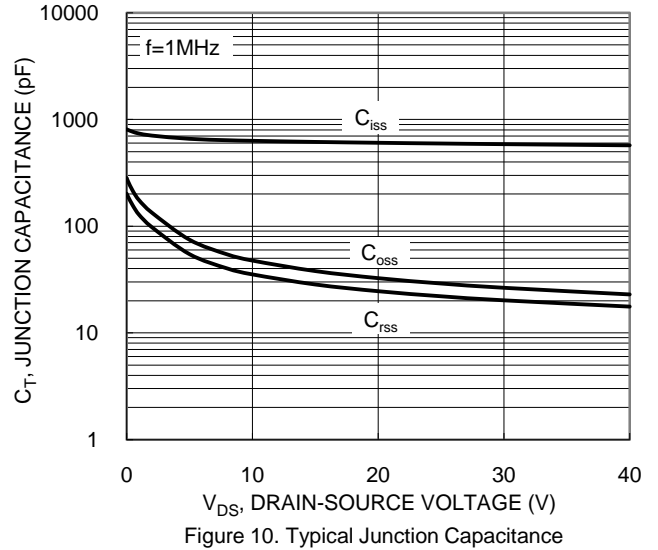
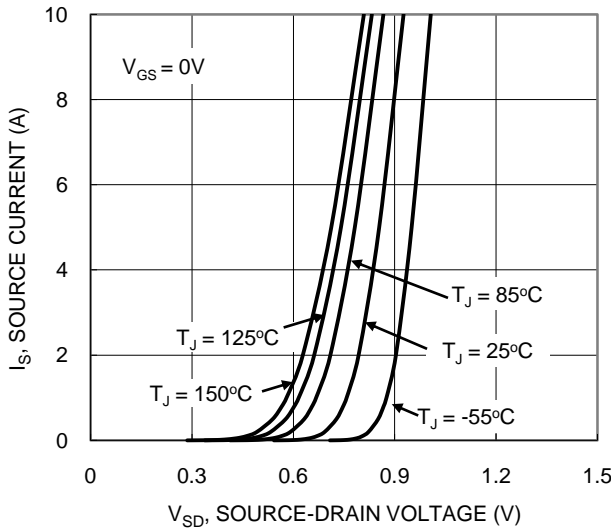
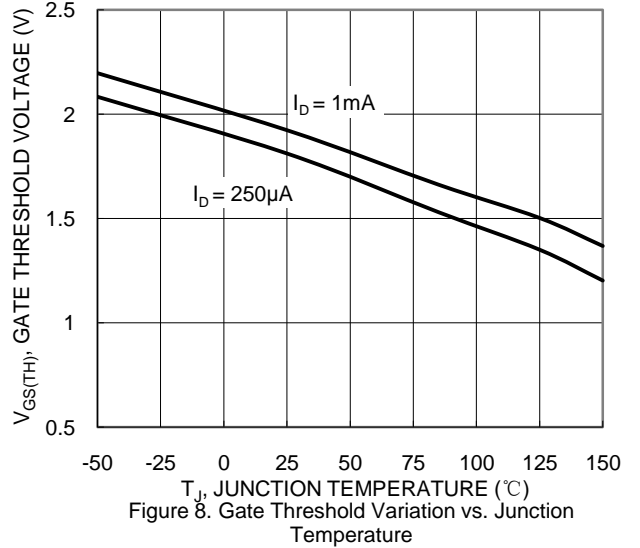
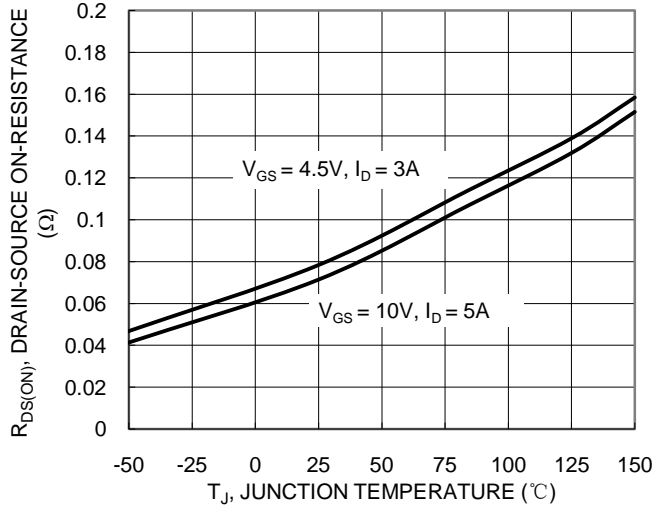


Figure 6. On-Resistance Variation with Temperature



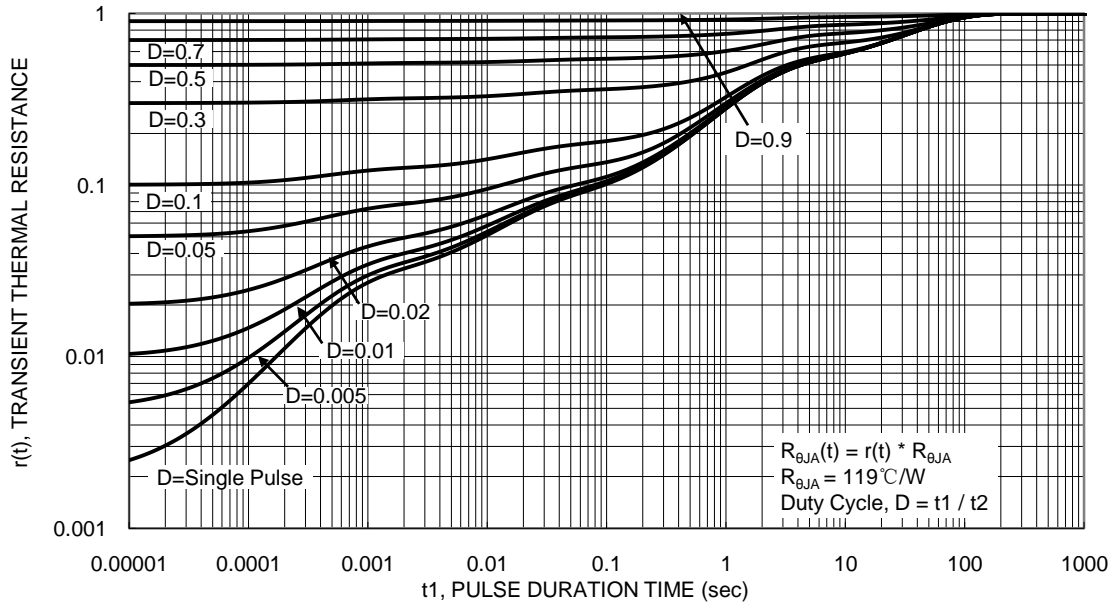
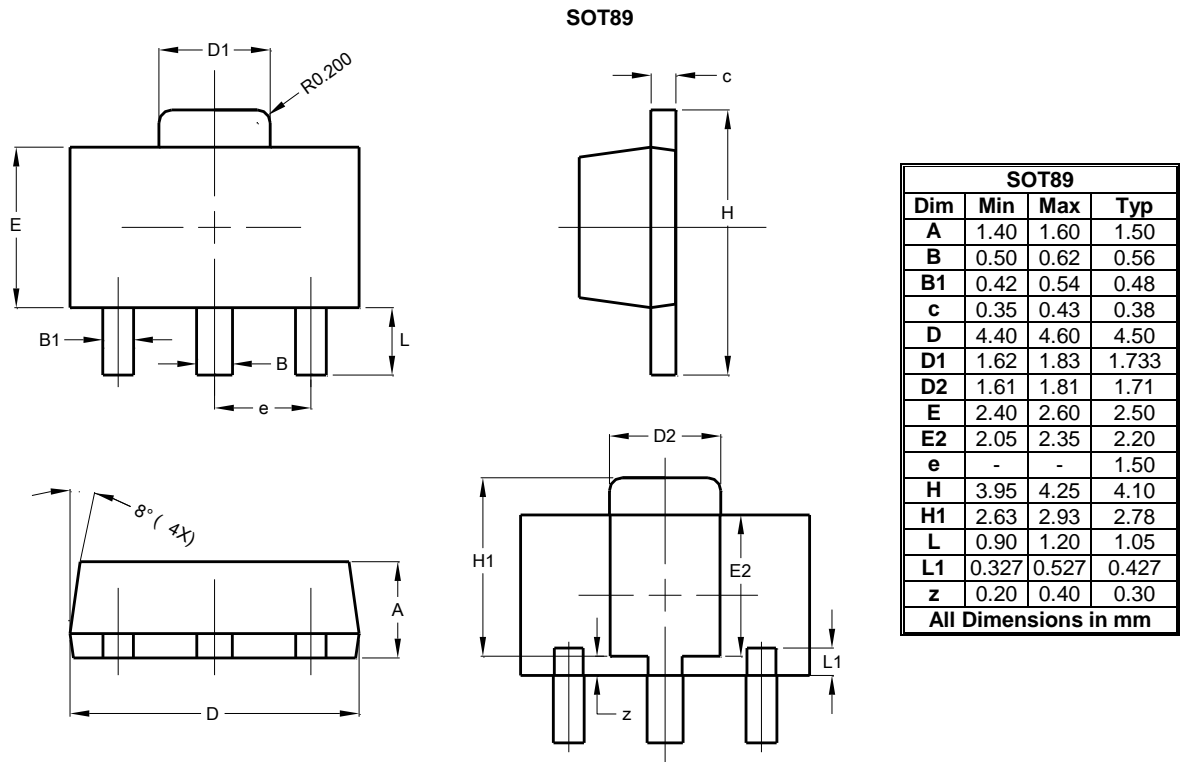


Figure 13. Transient Thermal Resistance

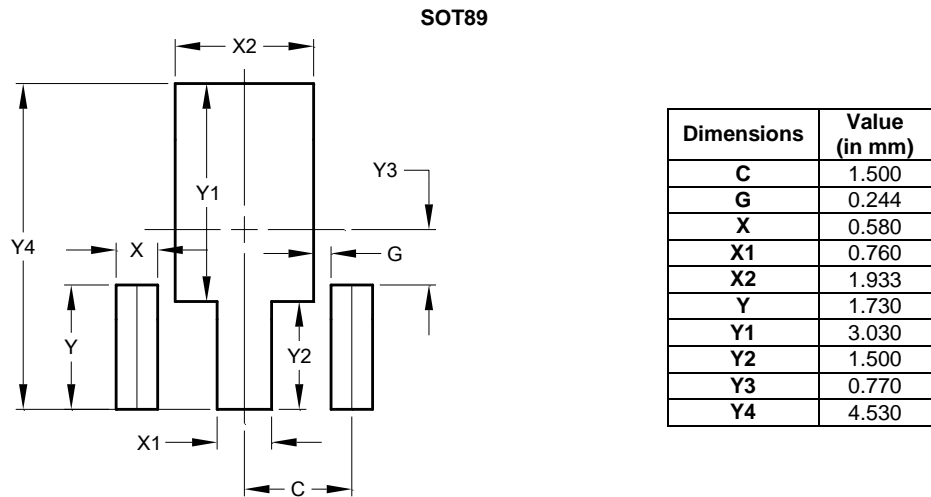
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