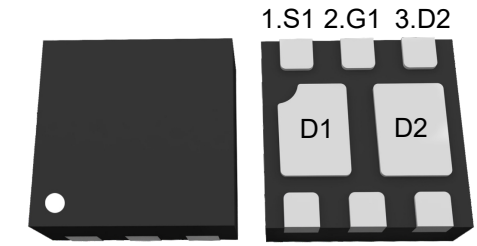
TN03DP20JDFA

Dual P-Channel Enhancement Mode Power MOSFET

Features

- Low gate charge and $R_{DS(ON)}$
- V_{DS}= -20V,I_D= -3A
  $R_{DS(on)}$< 55mΩ @V_{GS}= -10V

DFN2x2A-6L

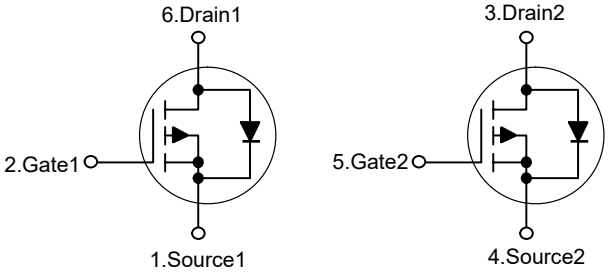


Marking Code: 03DP20

Applications

- PWM applications
- Load Switch for Portable Devices
- Power management

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25℃ ambient temperature unless otherwise specified.

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V_{DSS}	-20	V
Gate-Source Voltage			V_{GSS}	±8	V
Continuous Drain Current (Note 5) V_{GS} = -4.5V	Steady State	T_A = +25°C T_A = +70°C	I_D	-3.8 -3.0	A
Maximum Continuous Body Diode Forward Current (Note 5)			I_S	-1.0	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)			I_{DM}	-25	A
Avalanche Current (Note 7) L = 0.1mH			I_{AS}	-13	A
Avalanche Energy (Note 7) L = 0.1mH			E_{AS}	8.5	mJ

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T_A = +25°C	P_D	0.7	W
Thermal Resistance, Junction to Ambient (Note 5)	Steady State	$R_{\theta JA}$	178	°C/W
Total Power Dissipation (Note 6)	T_A = +25°C	P_D	1.4	W
Thermal Resistance, Junction to Ambient (Note 6)	Steady State	$R_{\theta JA}$	92	°C/W
Thermal Resistance, Junction to Case (Note 6)		$R_{\theta JC}$	22	
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	℃

Electrical Characteristics

(Ta=25℃ unless otherwise specified)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV_{DSS}	-20	—	—	V	V_{GS} = 0V, I_D = -250μA
Zero Gate Voltage Drain Current T_J = +25°C	I_{DSS}	—	—	-1.0	μA	V_{DS} = -20V, V_{GS} = 0V
Gate-Source Leakage	I_{GSS}	—	—	±10	μA	V_{GS} = ±6.4V, V_{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	$V_{GS(TH)}$	-0.35	—	-1.4	V	V_{DS} = V_{GS}, I_D = -250μA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	—	53	75	mΩ	V_{GS} = -4.5V, I_D = -2.9A
		—	64	137		V_{GS} = -2.5V, I_D = -2.3A
Diode Forward Voltage	V_{SD}	—	-0.7	-1.2	V	V_{GS} = 0V, I_S = -3.0A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C_{iss}	—	642	—	pF	V_{DS} = -10V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	—	98	—	pF	
Reverse Transfer Capacitance	C_{rss}	—	87	—	pF	
Gate Resistance	R_g	—	26.5	—	Ω	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz
Total Gate Charge (V_{GS} = -4.5V)	Q_g	—	8.8	—	nC	V_{DS} = -10V, I_D = -3.7A
Total Gate Charge (V_{GS} = -8V)		—	15	—	nC	
Gate-Source Charge	Q_{gs}	—	0.9	—	nC	
Gate-Drain Charge	Q_{gd}	—	2.9	—	nC	
Turn-On Delay Time	$t_{D(ON)}$	—	5.5	—	ns	V_{DD} = -10V, V_{GS} = -4.5V, R_L = 3.3Ω, R_g = 1Ω
Turn-On Rise Time	t_R	—	22.6	—	ns	
Turn-Off Delay Time	$t_{D(OFF)}$	—	34.1	—	ns	
Turn-Off Fall Time	t_F	—	34.3	—	ns	
Body Diode Reverse Recovery Time	t_{RR}	—	13	—	ns	I_S = -3.0A, dI/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q_{RR}	—	3.3	—	nC	I_S = -3.0A, dI/dt = 100A/μs

Notes: 5. Device mounted on FR-4 PC board, with minimum recommended pad layout, single sided

6. Device mounted on 1” x 1” FR-4 PCB with high coverage 2oz. Copper, single sided.
7. I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25℃ .
8. Short duration pulse test used to minimize self-heating effect.
9. Guaranteed by design. Not subject to product testing.

Typical Characteristic Curves

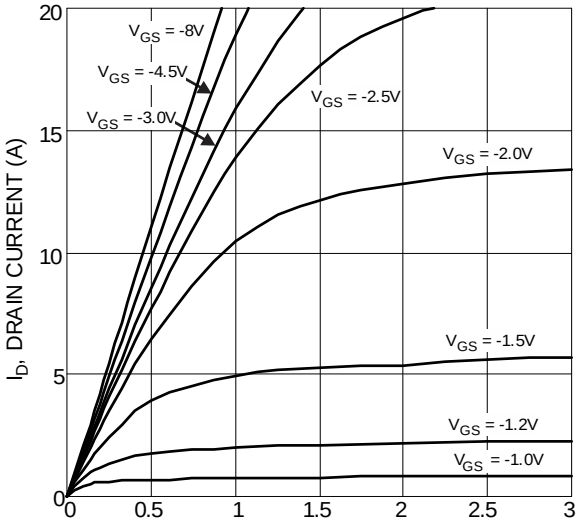


Figure 1 Typical Output Characteristic

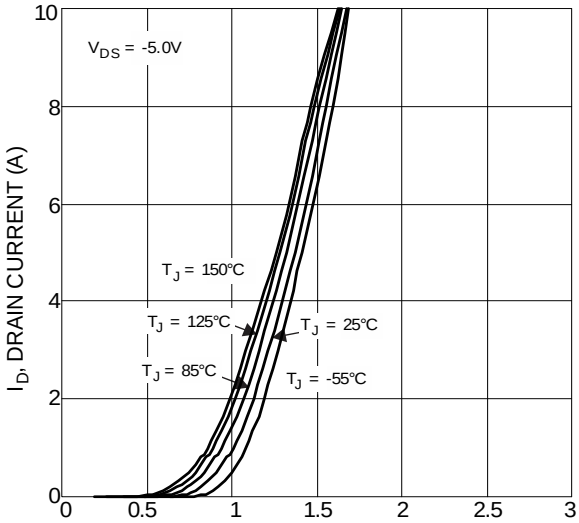


Figure 2 Typical Transfer Characteristics

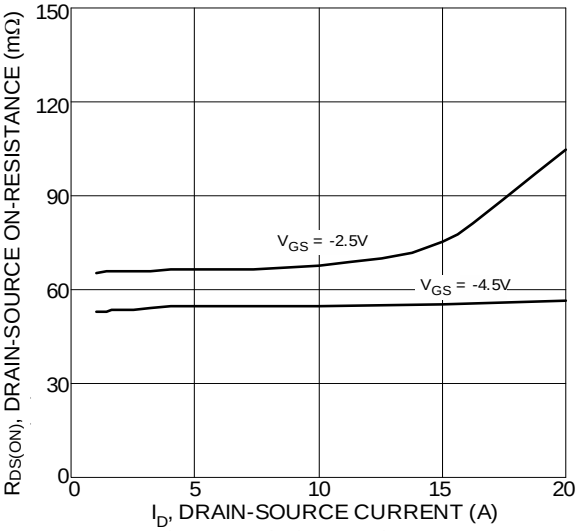


Figure 3 Typical On-Resistance vs. Drain Current and Gate Voltage

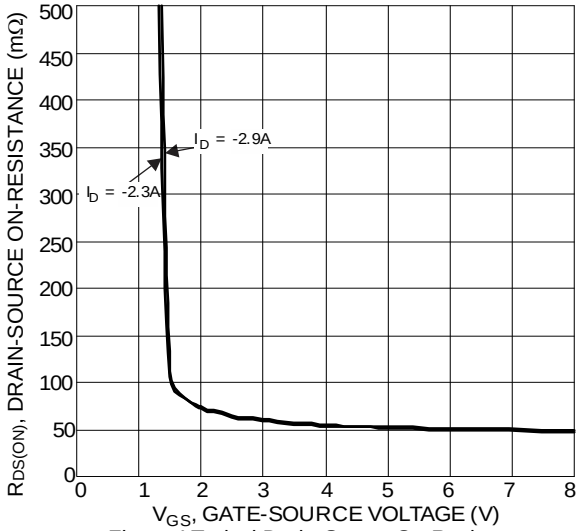


Figure 4 Typical Drain-Source On-Resistance vs. Gate-Source Voltage

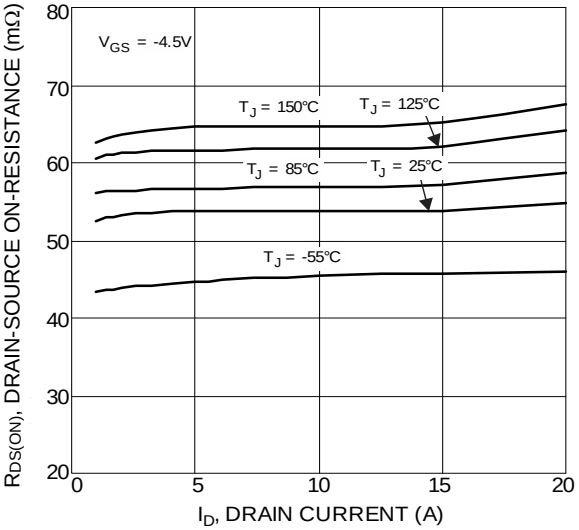


Figure 5 Typical On-Resistance vs. Drain Current and Temperature

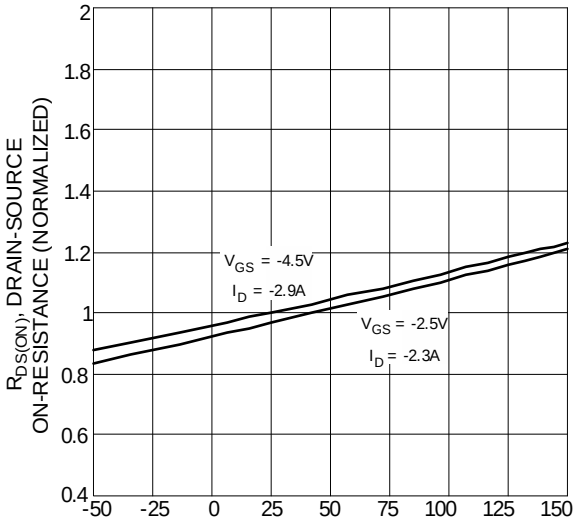


Figure 6 On-Resistance Variation with Temperature

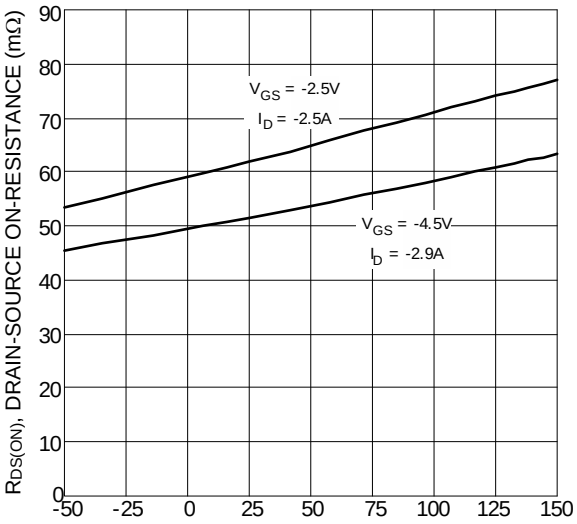


Figure 7 On-Resistance Variation with Temperature

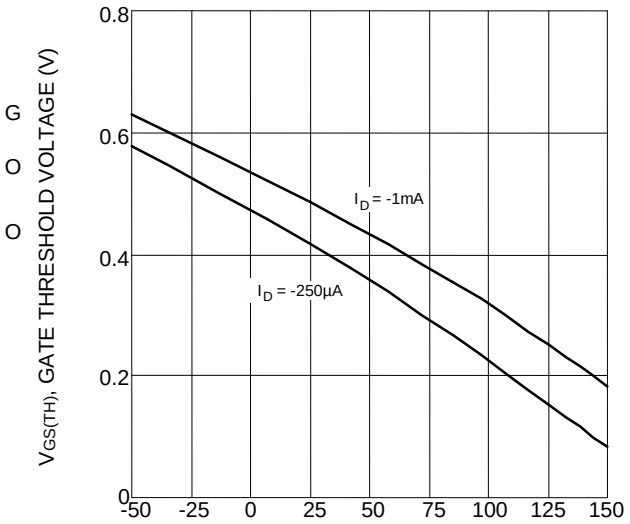


Figure 8 Gate Threshold Variation vs. Junction Temperature

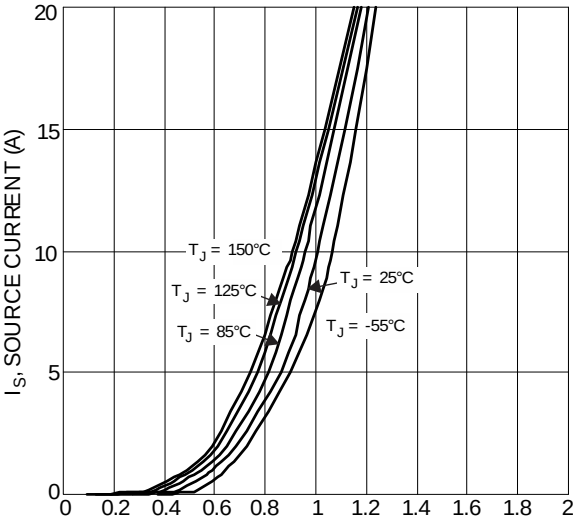


Figure 9 Diode Forward Voltage vs. Current

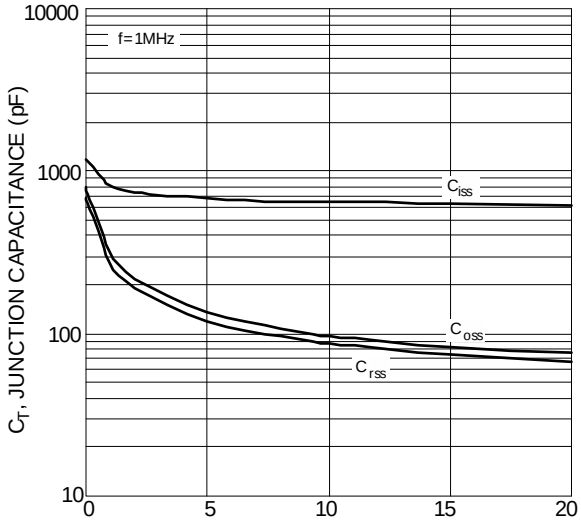


Figure 10 Typical Junction Capacitance

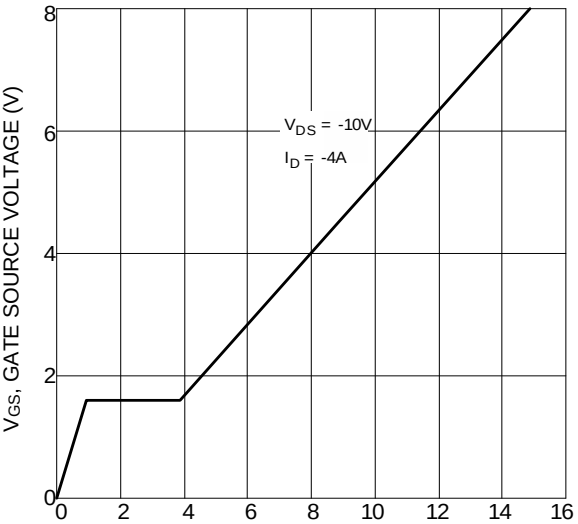


Figure 11 Gate Charge

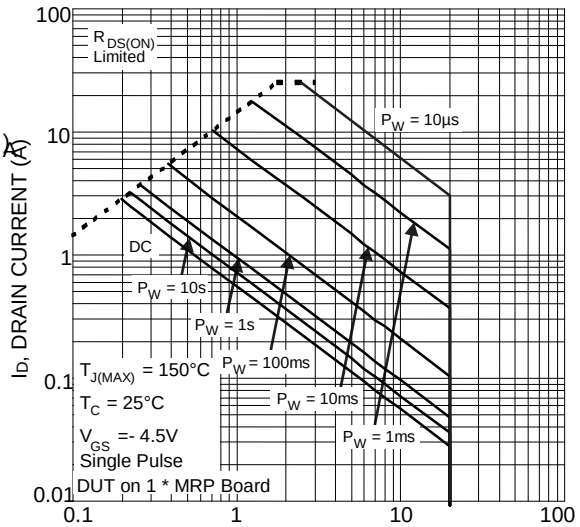


Figure 12 SOA, Safe Operation Area

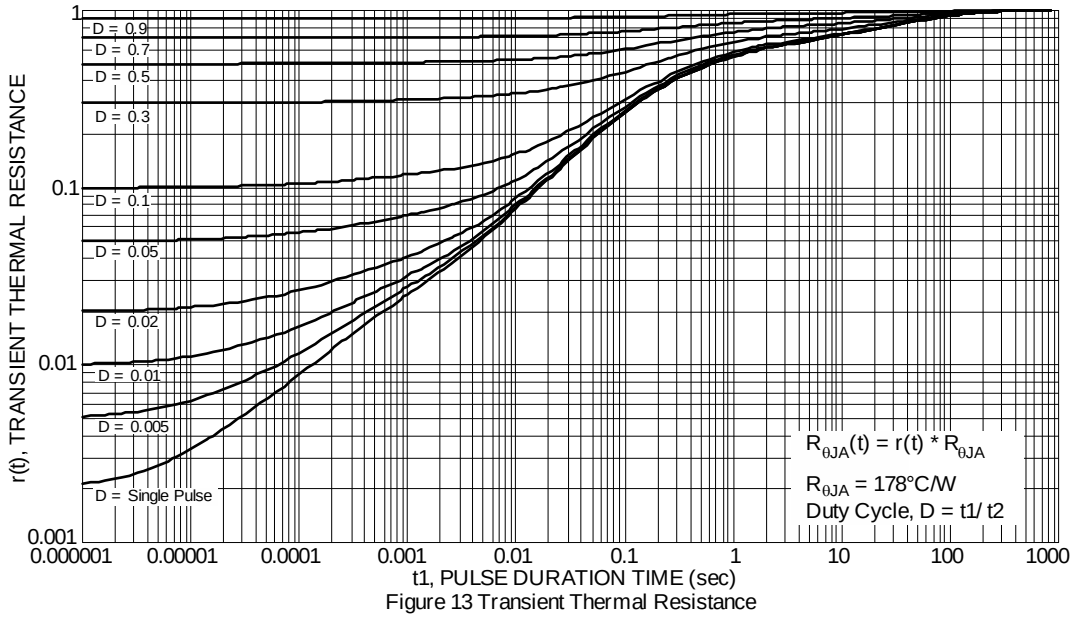
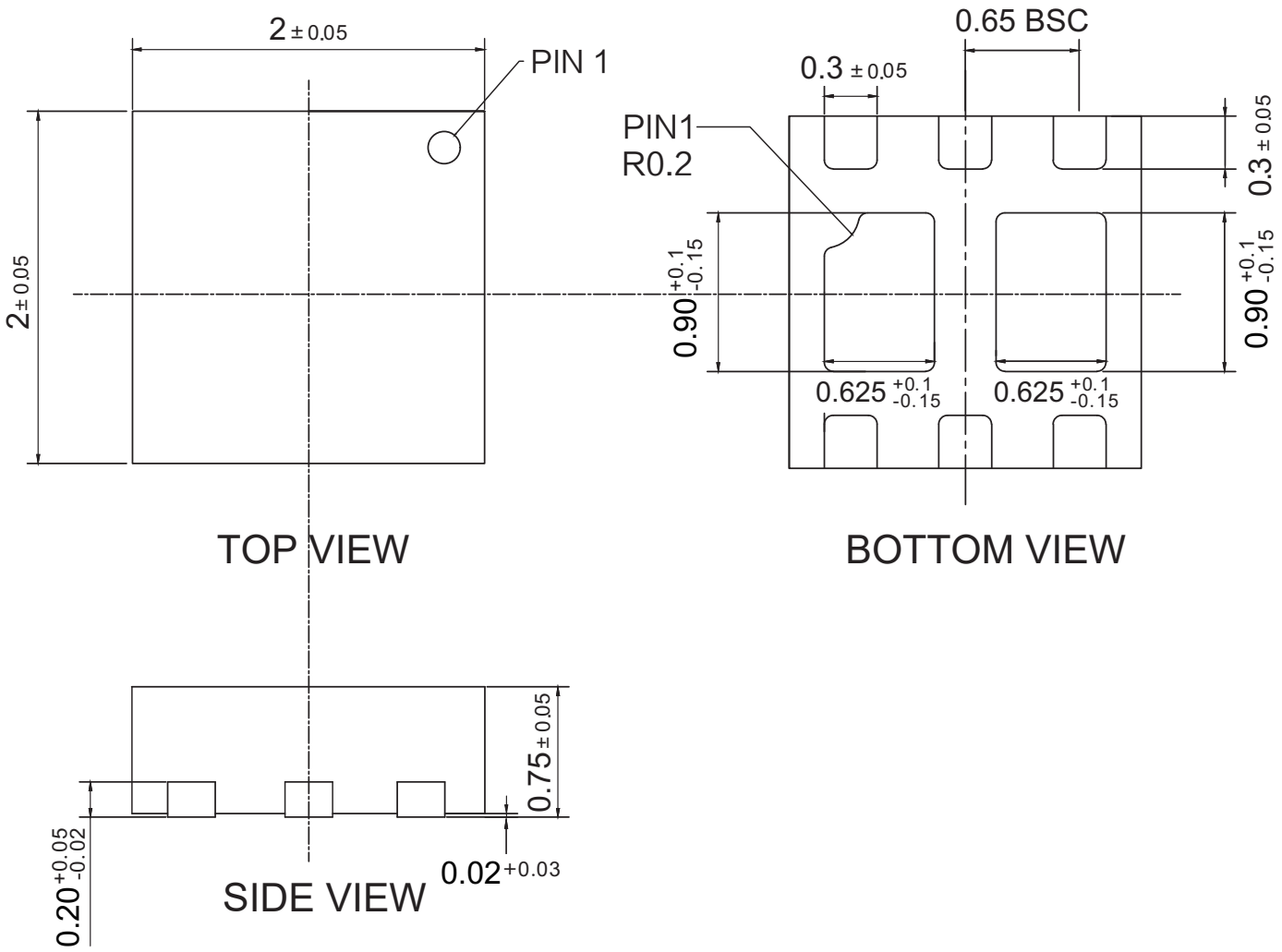


Figure 13 Transient Thermal Resistance

Package Outline

DFN2x2-6L-0002
Dimensions in mm



Ordering Information

Device	Package	Shipping
TN03DP20JDFA	DFN2x2A-6L	3,000PCS/Reel&7inches

Contact Information

TANI website: **http://www.tanisemi.com** Email:tani@tanisemi.com

For additional information, please contact your local Sales Representative.

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The product specification aims to provide users with a reference regarding various product parameters, performance, and usage. It presents certain aspects of the product's performance in graphical form and is intended solely for users to select product and make product comparisons, enabling users to better understand and evaluate the characteristics and advantages of the product. It does not constitute any commitment, warranty, or guarantee.

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