DATA SHEET
www.onsemi.com

MOSFET – Dual, P-Channel with ESD Protection, Small Signal, SOT-563

-20 V, -430 mA

NTZD3152P

Features

- Low $R_{DS(on)}$ Improving System Efficiency
- Low Threshold Voltage
- ESD Protected Gate
- Small Footprint 1.6 x 1.6 mm
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

Applications

- Load/Power Switches
- Power Supply Converter Circuits
- Battery Management
- Cell Phones, Digital Cameras, PDAs, Pagers, etc.

MAXIMUM RATINGS (T_J = 25 °C unless otherwise noted.)

Parameter			Symbol	Value	Unit
Drain-to-Source Voltage			V_{DSS}	−20	V
Gate-to-Source Voltage			V_{GS}	±6.0	V
Continuous Drain Current (Note 2)	Steady State	T_A = 25 °C	I_D	−430	mA
		T_A = 85 °C		−310	
Power Dissipation (Note 2)	Steady State		P_D	250	mW
Continuous Drain Current (Note 2)	t ≤ 5 s	T_A = 25 °C	I_D	−455	mA
		T_A = 85 °C		−328	
Power Dissipation (Note 2)	t ≤ 5 s		P_D	280	mW
Pulsed Drain Current	t_p = 10 µs		I_{DM}	−750	mA
Operating Junction and Storage Temperature			T_J, T_{STG}	−55 to 150	°C
Source Current (Body Diode)			I_S	−350	mA
Lead Temperature for Soldering Purposes (1/8″ from case for 10 s)			T_L	260	°C

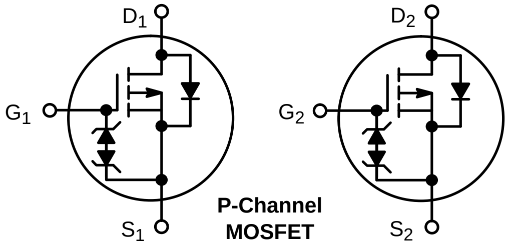
THERMAL RESISTANCE RATINGS

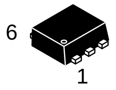
Parameter	Symbol	Max	Unit
Junction-to-Ambient − Steady State (Note 2)	$R_{\theta JA}$	500	°C/W
Junction-to-Ambient − t ≤ 5 s (Note 2)		447	

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

2. Surface mounted on FR4 board using 1 in. sq. pad size (Cu. area = 1.127 in. sq. [1 oz.] including traces).

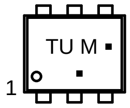
$V_{(BR)DSS}$	$R_{DS(on)}$ Typ	I_D Max
−20 V	0.5 Ω @ −4.5 V	−430 mA
	0.6 Ω @ −2.5 V	
	1.0 Ω @ −1.8 V	





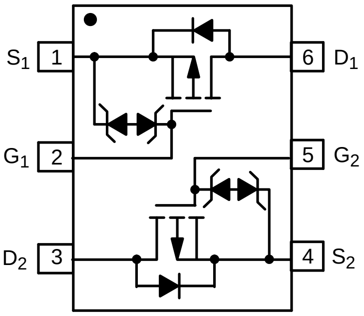
SOT-563-6
CASE 463A

MARKING DIAGRAM



TU = Specific Device Code
M = Date Code
▪ = Pb-Free Package
(Note: Microdot may be in either location)

PINOUT: SOT-563



Top View

ORDERING INFORMATION

Device	Package	Shipping†
NTZD3152PT1G	SOT-563 (Pb-Free)	4000 / Tape & Reel

DISCONTINUED (Note 1)

NTZD3152PT1H	SOT-563 (Pb-Free)	4000 / Tape & Reel
NTZD3152PT5H	SOT-563 (Pb-Free)	8000 / Tape & Reel

† For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

1. **DISCONTINUED:** These devices are not recommended for new design. Please contact your **onsemi** representative for information. The most current information on these devices may be available on www.onsemi.com.

October, 2025 − Rev. 7

Publication Order Number:
NTZD3152P/D

ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted.)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
OFF CHARACTERISTICS							
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = −250 μA		−20			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$				18		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V, V_{DS} = −16 V	T_J = 25 °C			−1.0	μA
			T_J = 125 °C			−2.0	
Gate-to-Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±4.5 V				±2.0	μA
ON CHARACTERISTICS (Note 3)							
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = −250 μA		−0.45		−1.0	V
Negative Threshold Temperature Coefficient	$V_{GS(TH)}/T_J$				−1.9		mV/°C
Drain-to-Source On Resistance	$R_{DS(on)}$	V_{GS} = −4.5 V, I_D = −430 mA			0.5	0.9	Ω
		V_{GS} = −2.5 V, I_D = −300 mA			0.6	1.2	
		V_{GS} = −1.8 V, I_D = −150 mA			1.0	2.0	
Forward Transconductance	g_{FS}	V_{DS} = −10 V, I_D = −430 mA			1.0		S
CHARGES AND CAPACITANCES							
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1.0 MHz, V_{DS} = −16 V			105	175	pF
Output Capacitance	C_{OSS}				15	30	
Reverse Transfer Capacitance	C_{RSS}				10	20	
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = −4.5 V, V_{DS} = −10 V, I_D = −215 mA			1.7	2.5	nC
Threshold Gate Charge	$Q_{G(TH)}$				0.1		
Gate-to-Source Charge	Q_{GS}				0.3		
Gate-to-Drain Charge	Q_{GD}				0.4		
SWITCHING CHARACTERISTICS (Note 4)							
Turn-On Delay Time	$t_{d(on)}$	V_{GS} = −4.5 V, V_{DD} = −10 V, I_D = −215 mA, R_G = 10 Ω			10		ns
Rise Time	t_r				12		
Turn-Off Delay Time	$t_{d(off)}$				35		
Fall Time	t_f				19		
DRAIN-SOURCE DIODE CHARACTERISTICS							
Forward Diode Voltage	V_{SD}	V_{GS} = 0 V, I_S = −350 mA	T_J = 25 °C		−0.8	−1.2	V
Reverse Recovery Time	t_{RR}	V_{GS} = 0 V, dI_{SD}/dt = 100 A/μs, I_S = −350 mA			13		ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

3. Pulse Test: pulse width ≤ 300 μs, duty cycle ≤ 2%.
4. Switching characteristics are independent of operating junction temperatures.

TYPICAL PERFORMANCE CURVES (T_J = 25 °C unless otherwise noted)

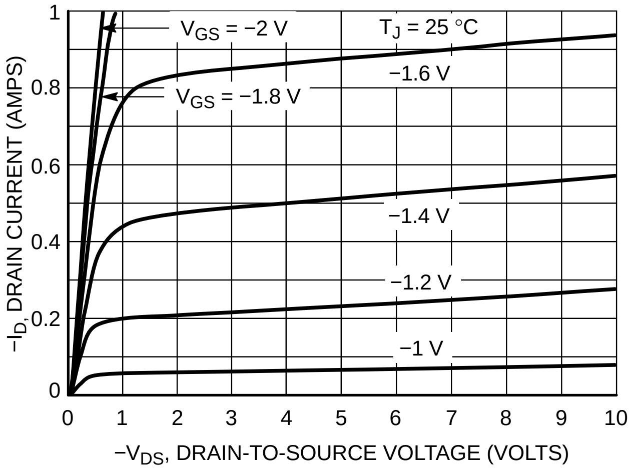


Figure 1. On-Region Characteristics

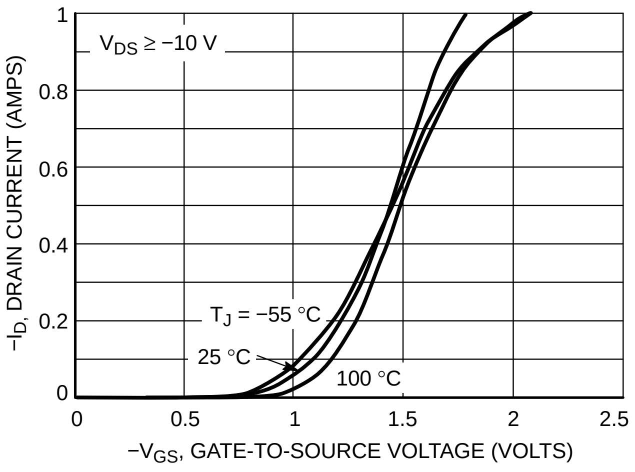


Figure 2. Transfer Characteristics

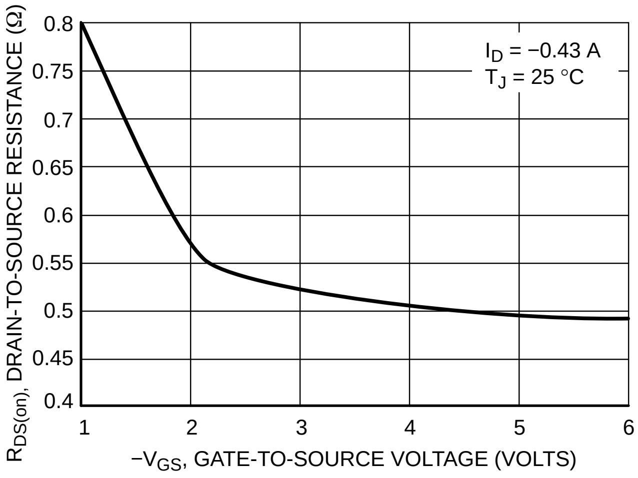


Figure 3. On-Resistance vs. Gate-to-Source Voltage

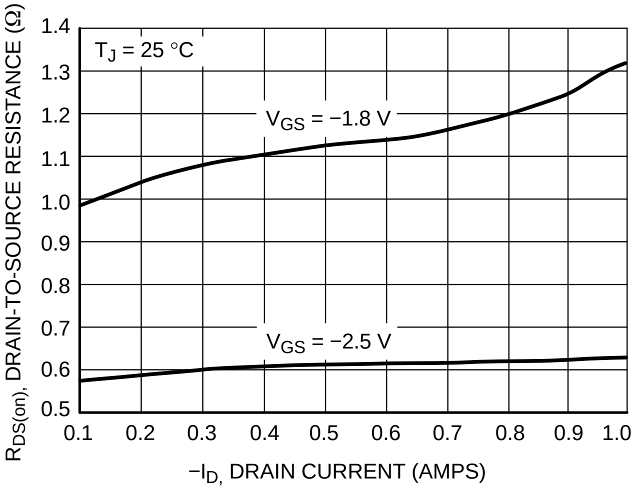


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

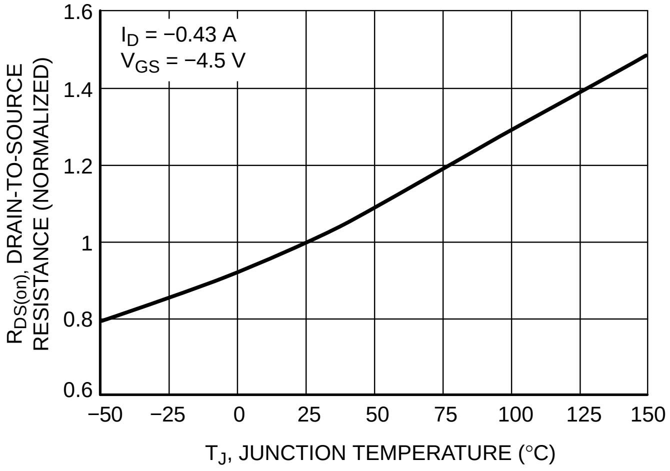


Figure 5. On-Resistance Variation with Temperature

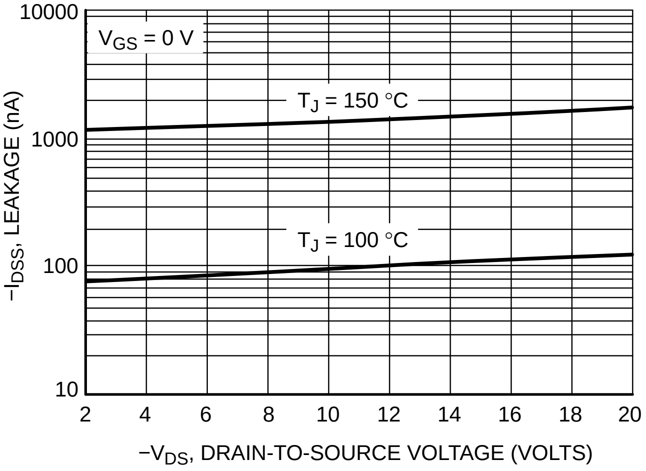


Figure 6. Drain-to-Source Leakage Current vs. Voltage

TYPICAL PERFORMANCE CURVES (T_J = 25 °C unless otherwise noted)

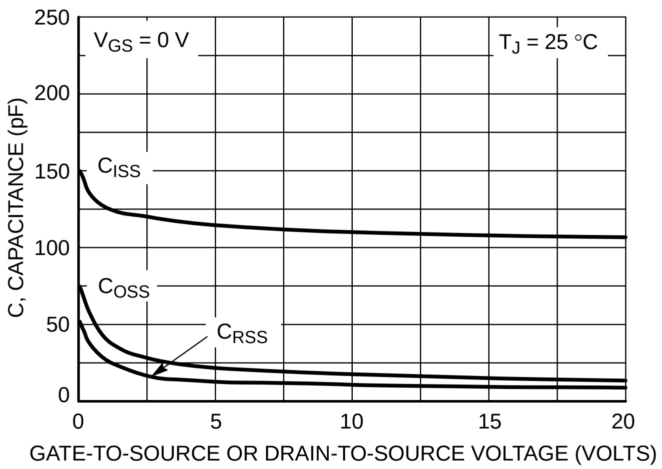


Figure 7. Capacitance Variation

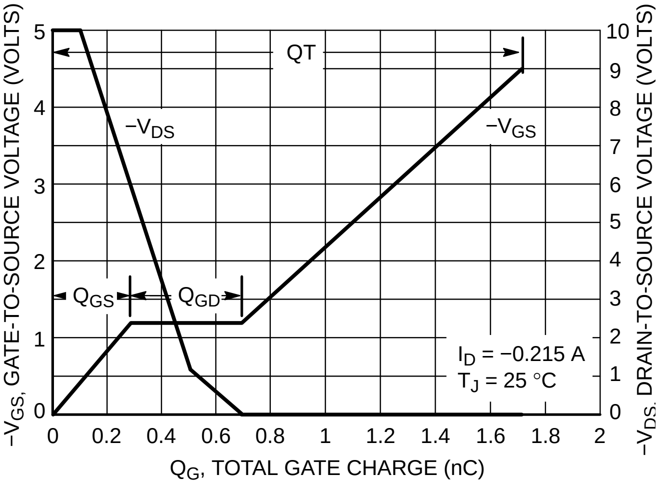


Figure 8. Gate-to-Source and Drain-to-Source Voltage vs. Total Charge

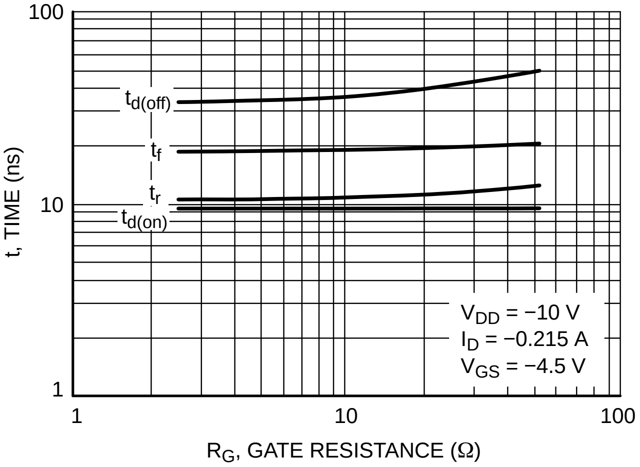


Figure 9. Resistive Switching Time Variation vs. Gate Resistance

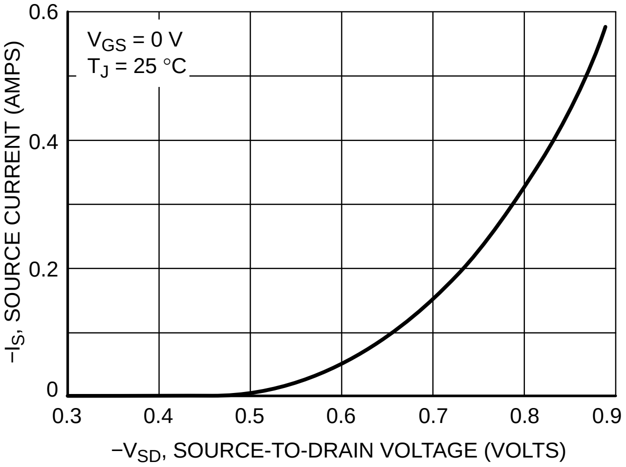


Figure 10. Diode Forward Voltage vs. Current

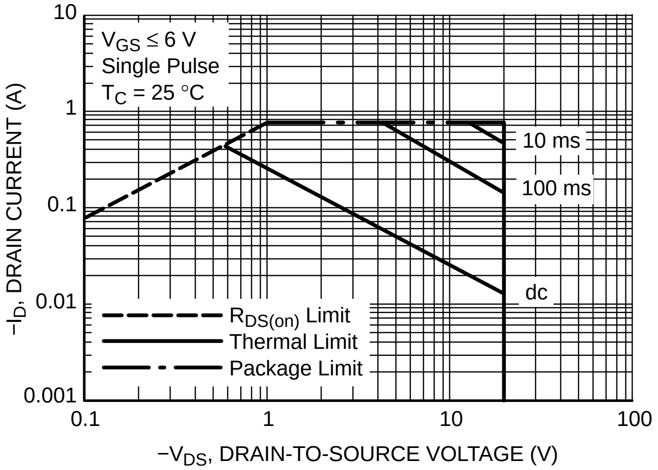
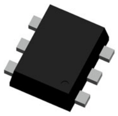


Figure 11. Safe Operating Area

REVISION HISTORY

Revision	Description of Changes	Date
7	Rebranded the Data Sheet to **onsemi** format. NTZD3152PT1H, NTZD3152PT5H OPNs marked as Discontinued.	10/16/2025

This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

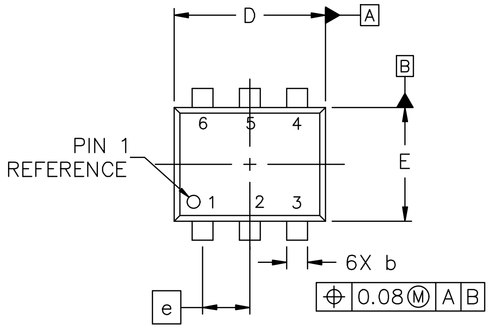


SOT-563-6 1.60x1.20x0.55, 0.50P

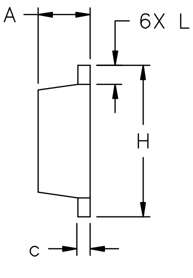
CASE 463A
ISSUE J

DATE 15 FEB 2024

NOTES:
1. DIMENSIONING AND TOLERANCING CONFORM TO ASME Y14.5-2018.
2. ALL DIMENSION ARE IN MILLIMETERS.
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

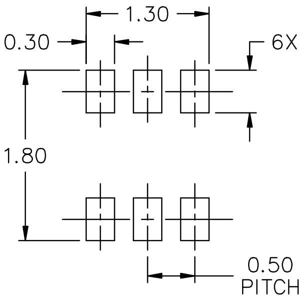


TOP VIEW



SIDE VIEW

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.50	0.55	0.60
b	0.17	0.22	0.27
c	0.08	0.13	0.18
D	1.50	1.60	1.70
E	1.10	1.20	1.30
e	0.50 BSC		
H	1.50	1.60	1.70
L	0.10	0.20	0.30



RECOMMENDED MOUNTING FOOTPRINT*

* FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D.

STYLE 1:
PIN 1. EMITTER 1
2. BASE 1
3. COLLECTOR 2
4. EMITTER 2
5. BASE 2
6. COLLECTOR 1

STYLE 2:
PIN 1. EMITTER 1
2. EMITTER 2
3. BASE 2
4. COLLECTOR 2
5. BASE 1
6. COLLECTOR 1

STYLE 3:
PIN 1. CATHODE 1
2. CATHODE 1
3. ANODE/ANODE 2
4. CATHODE 2
5. CATHODE 2
6. ANODE/ANODE 1

STYLE 4:
PIN 1. COLLECTOR
2. COLLECTOR
3. BASE
4. EMITTER
5. COLLECTOR
6. COLLECTOR

STYLE 5:
PIN 1. CATHODE
2. CATHODE
3. ANODE
4. ANODE
5. CATHODE
6. CATHODE

STYLE 6:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. CATHODE
5. CATHODE
6. CATHODE

STYLE 7:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. CATHODE
5. ANODE
6. CATHODE

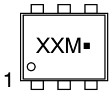
STYLE 8:
PIN 1. DRAIN
2. DRAIN
3. GATE
4. SOURCE
5. DRAIN
6. DRAIN

STYLE 9:
PIN 1. SOURCE 1
2. GATE 1
3. DRAIN 2
4. SOURCE 2
5. GATE 2
6. DRAIN 1

STYLE 10:
PIN 1. CATHODE 1
2. N/C
3. CATHODE 2
4. ANODE 2
5. N/C
6. ANODE 1

STYLE 11:
PIN 1. EMITTER 2
2. BASE 2
3. COLLECTOR 1
4. EMITTER 1
5. BASE 1
6. COLLECTOR 2

GENERIC MARKING DIAGRAM*



XX = Specific Device Code
M = Month Code
▪ = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

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DESCRIPTION:	**SOT-563-6 1.60x1.20x0.55, 0.50P**	**PAGE 1 OF 1**

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