NTUD3129PT5G Datasheet

DiGi Electronics Part Number	NTUD3129PT5G-DG
Manufacturer	onsemi
Manufacturer Product Number	NTUD3129PT5G
Description	MOSFET 2P-CH 20V 0.14A SOT963
Detailed Description	Mosfet Array 20V 140mA 125mW Surface Mount SOT-963

https://www.DiGi-Electronics.com

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
NTUD3129PT5G	onsemi
Series:	Product Status:
-	Obsolete
Technology:	Configuration:
MOSFET (Metal Oxide)	2 P-Channel (Dual)
FET Feature:	Drain to Source Voltage (Vdss):
Logic Level Gate	20V
Current - Continuous Drain (Id) @ 25°C:	Rds On (Max) @ Id, Vgs:
140mA	5Ohm @ 100mA, 4.5V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
1V @ 250µA	-
Input Capacitance (Ciss) (Max) @ Vds:	Power - Max:
12pF @ 15V	125mW
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Surface Mount
Package / Case:	Supplier Device Package:
SOT-963	SOT-963
Base Product Number:	
NTUD31	

Environmental & Export classification

Moisture Sensitivity Level (MSL):	REACH Status:
1 (Unlimited)	REACH Unaffected
ECCN:	HTSUS:
EAR99	8541.21.0095

NTUD3129P

Small Signal MOSFET

-20 V, -180 mA, Dual P-Channel, 1.0 x 1.0 mm SOT-963 Package

ON Semiconductor®

http://onsemi.com

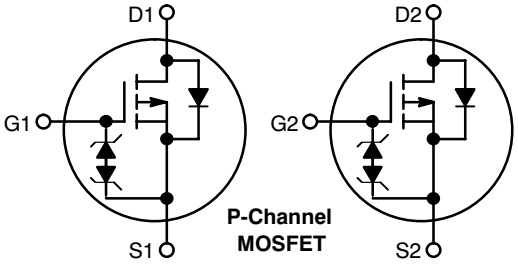
Features

- Dual P-Channel MOSFET
- Offers a Low $R_{DS(ON)}$ Solution in the Ultra Small 1.0 x 1.0 mm Package
- 1.5V Gate Voltage Rating
- Ultra Thin Profile (< 0.5 mm) Allows It to Fit Easily into Extremely Thin Environments such as Portable Electronics.
- These are Pb-Free Devices

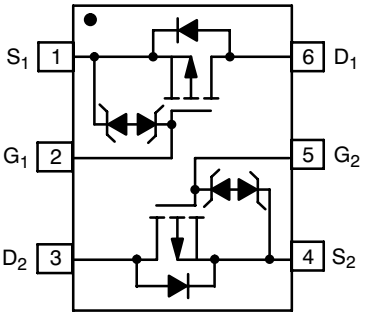
Applications

- General Purpose Interfacing Switch
- Optimized for Power Management in Ultra Portable Equipment

$V_{(BR)DSS}$	$R_{DS(ON)}$ MAX	I_D Max
-20 V	5.0 Ω @ -4.5 V	-0.18 A
	7.0 Ω @ -2.5 V	
	10 Ω @ -1.8 V	
	14 Ω @ -1.5 V	



PINOUT: SOT-963



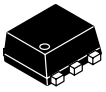
Top View

MAXIMUM RATINGS (T_J = 25°C unless otherwise specified)

Parameter			Symbol	Value	Unit
Drain-to-Source Voltage			V_{DSS}	-20	V
Gate-to-Source Voltage			V_{GS}	±8	V
Continuous Drain Current (Note 1)	Steady State	T_A = 25°C	I_D	-140	mA
		T_A = 85°C		-100	
	t ≤ 5 s	T_A = 25°C		-180	
Power Dissipation (Note 1)	Steady State	T_A = 25°C	P_D	-125	mW
	t ≤ 5 s			-200	
Pulsed Drain Current		t_p = 10 μs	I_{DM}	-600	mA
Operating Junction and Storage Temperature			T_J, T_{STG}	-55 to 150	°C
Source Current (Body Diode) (Note 2)			I_S	-200	mA
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)			T_L	260	°C

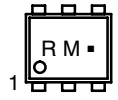
Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Surface-mounted on FR4 board using the minimum recommended pad size, 1 oz Cu.
2. Pulse Test: pulse width ≤300 μs, duty cycle ≤2%



SOT-963
CASE 527AA

MARKING DIAGRAM



R = Specific Device Code
M = Date Code
▪ = Pb-Free Package

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 4 of this data sheet.

NTUD3129P

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Max	Unit
Junction-to-Ambient – Steady State (Note 3)	$R_{\theta JA}$	1000	°C/W
Junction-to-Ambient – t = 5 s (Note 3)		600	

3. Surface-mounted on FR4 board using the minimum recommended pad size, 1 oz Cu.

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

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
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V, V_{DS} = -5.0 V	T_J = 25°C			-50	nA
			T_J = 85°C			-200	
		V_{GS} = 0 V, V_{DS} = -16 V	T_J = 25°C			-100	
Gate-to-Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±5.0 V				±100	nA
ON CHARACTERISTICS (Note 4)							
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = -250 μA		-0.4		-1.0	V
Drain-to-Source On Resistance	$R_{DS(ON)}$	V_{GS} = -4.5 V, I_D = -100 mA			4.0	5.0	Ω
		V_{GS} = -2.5 V, I_D = -50 mA			5.0	7.0	
		V_{GS} = -1.8 V, I_D = -20 mA			6.5	10	
		V_{GS} = -1.5 V, I_D = -10 mA			7.5	14	
		V_{GS} = -1.2 V, I_D = -1.0 mA			11.5		
Forward Transconductance	g_{FS}	V_{DS} = -5.0 V, I_D = -125 mA			0.26		S
Source-Drain Diode Voltage	V_{SD}	V_{GS} = 0 V, I_D = -10 mA			-0.65	-1.0	V
CHARGES, CAPACITANCES AND GATE RESISTANCE							
Input Capacitance	C_{ISS}	f = 1 MHz, V_{GS} = 0 V V_{DS} = -15 V			12		pF
Output Capacitance	C_{OSS}				2.7		
Reverse Transfer Capacitance	C_{RSS}				1.0		
SWITCHING CHARACTERISTICS, V_{GS} = 4.5 V (Note 4)							
Turn-On Delay Time	$t_{d(ON)}$	V_{GS} = -4.5 V, V_{DD} = -15 V, I_D = -180 mA, R_G = 2.0 Ω			20		ns
Rise Time	t_r				37		
Turn-Off Delay Time	$t_{d(OFF)}$				112		
Fall Time	t_f				97		

4. Switching characteristics are independent of operating junction temperatures

NTUD3129P

TYPICAL PERFORMANCE CURVES

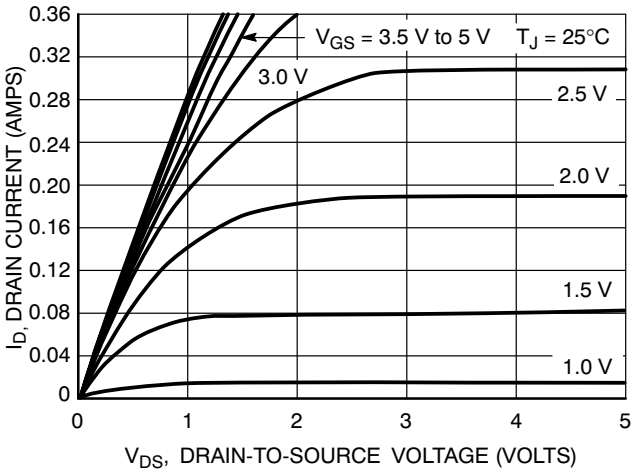


Figure 1. On-Region Characteristics

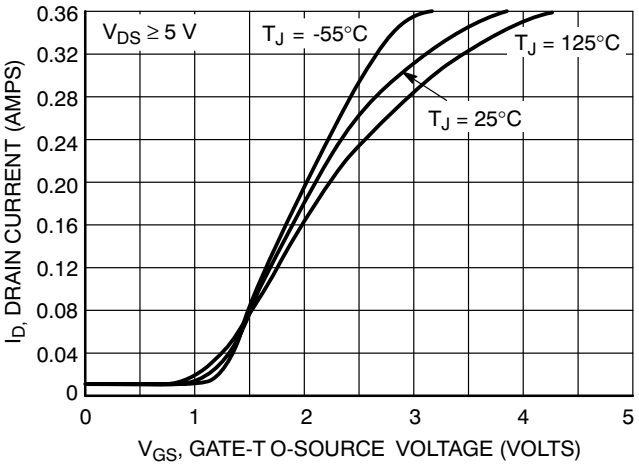


Figure 2. Transfer Characteristics

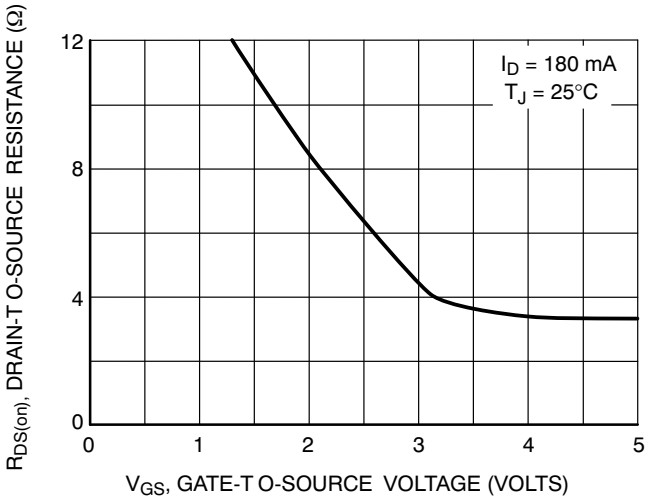


Figure 3. On-Resistance vs. Gate Voltage

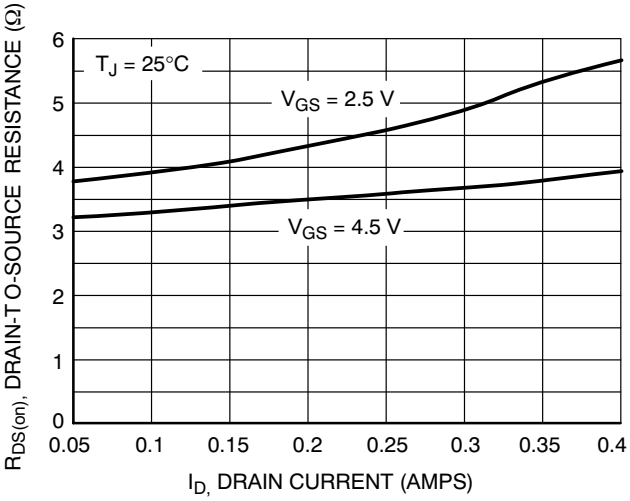


Figure 4. On-Resistance vs. Drain Current and Gate Voltage

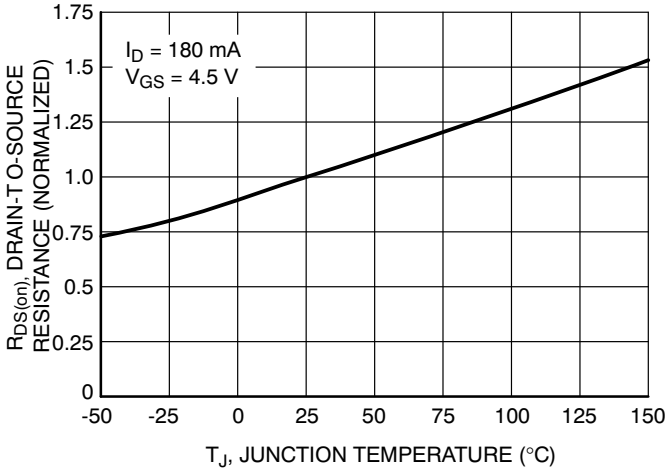


Figure 5. On-Resistance Variation with Temperature

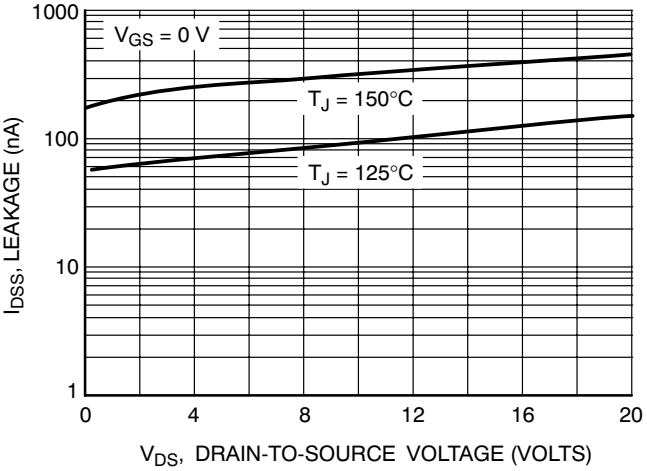


Figure 6. Drain-to-Source Leakage Current vs. Voltage

NTUD3129P

TYPICAL PERFORMANCE CURVES

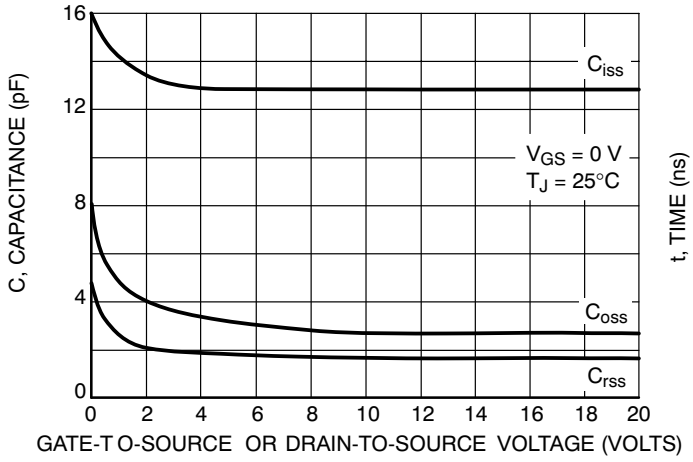


Figure 7. Capacitance Variation

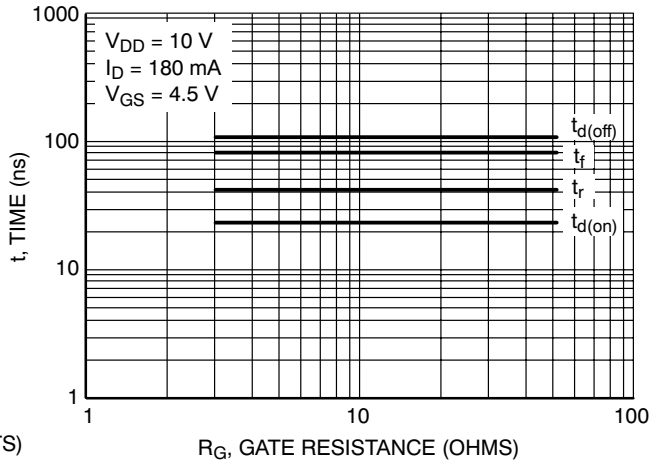


Figure 8. Resistive Switching Time Variation vs. Gate Resistance

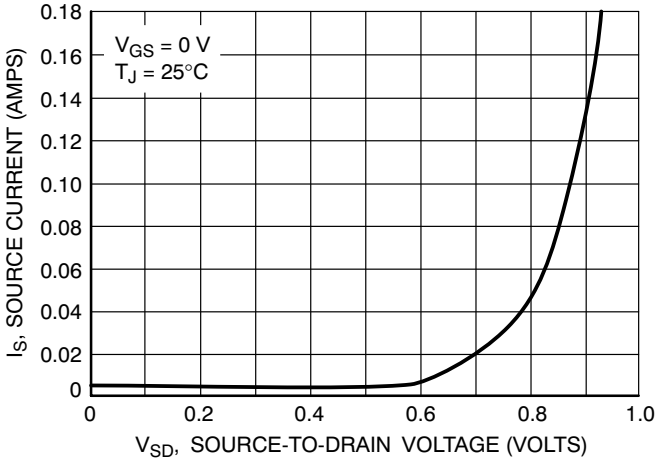


Figure 9. Diode Forward Voltage vs. Current

ORDERING INFORMATION

Device	Package	Shipping†
NTUD3129PT5G	SOT-963 (Pb-Free)	8000 / Tape & Reel

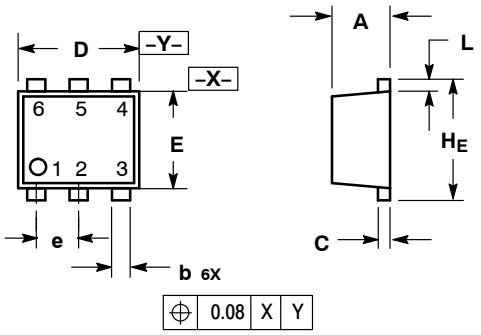
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

SOT−963
CASE 527AA
ISSUE D

DATE 30 JUL 2008

SCALE 4:1



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETERS
3. MAXIMUM LEAD THICKNESS INCLUDES LEAD FINISH THICKNESS. MINIMUM LEAD THICKNESS IS THE MINIMUM THICKNESS OF BASE MATERIAL.

	MILLIMETERS			INCHES		
DIM	MIN	NOM	MAX	MIN	NOM	MAX
A	0.40	0.45	0.50	0.016	0.018	0.020
b	0.10	0.15	0.20	0.004	0.006	0.008
C	0.05	0.10	0.15	0.002	0.004	0.006
D	0.95	1.00	1.05	0.037	0.039	0.041
E	0.75	0.80	0.85	0.03	0.032	0.034
e	0.35 BSC			0.014 BSC		
L	0.05	0.10	0.15	0.002	0.004	0.006
HE	0.95	1.00	1.05	0.037	0.039	0.041

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. EMITTER2
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

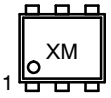
STYLE 7:
PIN 1. CATHODE
2. ANODE
3. CATHODE
4. CATHODE
5. ANODE
6. CATHODE

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

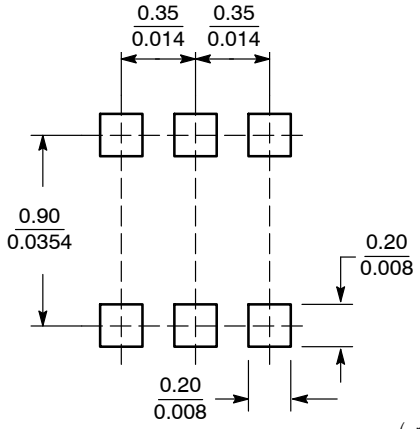
GENERIC MARKING DIAGRAM*



X = Specific Device Code
M = Month Code

*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.

SOLDERING FOOTPRINT*



SCALE 20:1 (mm / inches)

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

DOCUMENT NUMBER:	**98AON18698D**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped “CONTROLLED COPY” in red.	
DESCRIPTION:	**SOT−963, 1X1, 0.35P**		**PAGE 1 OF 1**

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support
For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales

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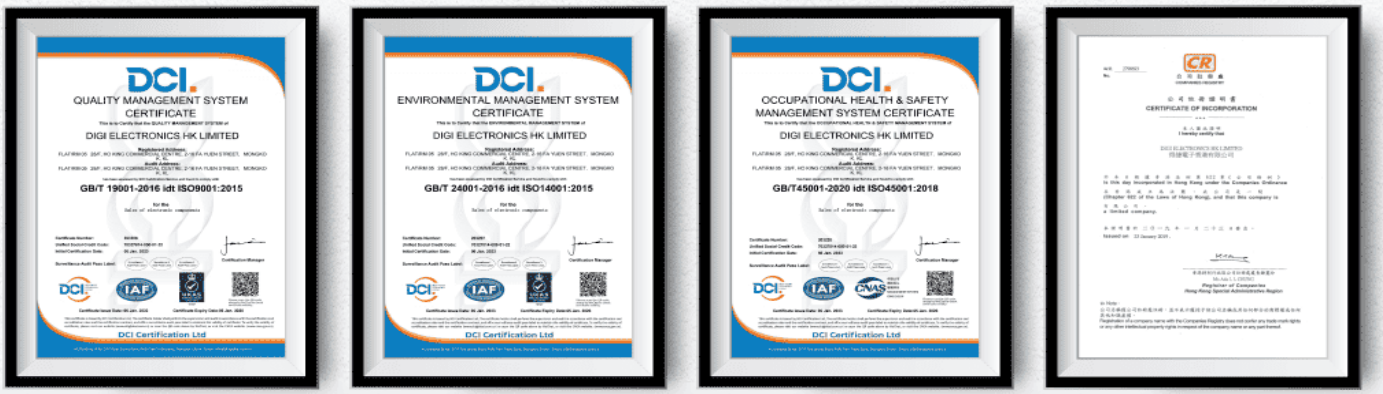

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