N-Channel JFETs

2N4856JAN 2N4856JANTX 2N4856JANTXV
2N4857JAN 2N4857JANTX 2N4857JANTXV
2N4858JAN 2N4858JANTX 2N4858JANTXV
2N4859JAN 2N4859JANTX 2N4859JANTXV
2N4860JAN 2N4860JANTX 2N4860JANTXV
2N4861JAN 2N4861JANTX 2N4861JANTXV

PRODUCT SUMMARY

Part Number	$V_{GS(off)}$ (V)	$V_{(BR)GSS}$ Min (V)	$r_{DS(on)}$ Max (Ω)	$I_{D(off)}$ Max (pA)	t_{ON} Typ (ns)
2N4856	–4 to –10	–40	25	250	9
2N4857	–2 to –6	–40	40	250	10
2N4858	–0.8 to –4	–40	60	250	20
2N4859	–4 to –10	–30	25	250	9
2N4860	–2 to –6	–30	40	250	10
2N4861	–0.8 to –4	–30	60	250	20

FEATURES

- Low On-Resistance: 2N4856 <25 Ω
- Fast Switching—t_{ON}: 4 ns
- High Off-Isolation—$I_{D(off)}$: 5 pA
- Low Capacitance: 3 pF
- Low Insertion Loss
- N-Channel Majority Carrier FET

BENEFITS

- Low Error Voltage
- High-Speed Analog Circuit Performance
- Negligible “Off-Error,” Excellent Accuracy
- Good Frequency Response, Low Glitches
- Eliminates Additional Buffering
- High Radiation Tolerance

APPLICATIONS

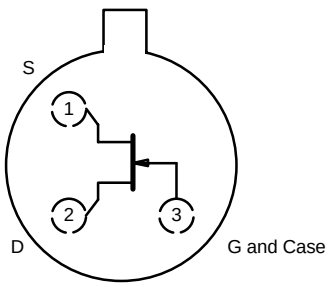
- Analog Switches
- Choppers
- Sample-and-Hold
- Normally “On” Switches
- Current Limiters

DESCRIPTION

The 2N4856JAN/JANTX/JANTXV all-purpose JFET analog switches offer low on-resistance, low capacitance, good isolation, and fast switching.

Hermetically-sealed TO-206AA (TO-18) packaging allows full military processing (see Military Information). For similar products in TO-226AA (TO-92) and TO-236 (SOT-23) packages, see the J/SST111 series data sheet. For similar duals, see the 2N5564/5565/5566 data sheet.

TO-206AA (TO-18)



Top View

ABSOLUTE MAXIMUM RATINGS

Gate-Drain, Gate-Source Voltage :
(2N4856-58) . . . . . –40 V
(2N4859-61) . . . . . –30 V
Gate Current . . . . . 50 mA
Lead Temperature ($^1/_{16}$" from case for 10 seconds) . . . . . 300 °C
Storage Temperature . . . . . –65 to 200°C
Operating Junction Temperature . . . . . –65 to 200°C
Power Dissipation[a] . . . . . 1800 mW

Notes
a. Derate 10.3 mW/°C to T_C > 25°C

SPECIFICATIONS FOR 2N4856, 2N4857 AND 2N4858 (T_A = 25°C UNLESS NOTED)

Parameter	Symbol	Test Conditions	Typ[a]	Limits 2N4856 Min	2N4856 Max	2N4857 Min	2N4857 Max	2N4858 Min	2N4858 Max	Unit
Static										
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	I_G = –1 µA , V_{DS} = 0 V	–55	–40		–40		–40		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	V_{DS} = 15 V, I_D = 0.5 nA		–4	–10	–2	–6	–0.8	–4	
Saturation Drain Current[b]	I_{DSS}	V_{DS} = 15 V, V_{GS} = 0 V		50	175	20	100	8	80	mA
Gate Reverse Current	I_{GSS}	V_{GS} = –20 V, V_{DS} = 0 V	–5		–250		–250		–250	pA
		T_A = 150°C	–13		–500		–500		–500	nA
Gate Operating Current[c]	I_G	V_{DG} = 15 V, I_D = 10 mA	–5							pA
Drain Cutoff Current	$I_{D(off)}$	V_{DS} = 15 V, V_{GS} = –10 V	5		250		250		250	
		T_A = 150°C	13		500		500		500	nA
Drain-Source On-Voltage	$V_{DS(on)}$	V_{GS} = 0 V, I_D = 5 mA	0.25						0.5	V
		I_D = 10 mA	0.35				0.5			
		I_D = 20 mA	0.5		0.75					
Drain-Source On-Resistance[c]	$r_{DS(on)}$	V_{GS} = 0 V, I_D = 1 mA			25		40		60	Ω
Gate-Source Forward Voltage[c]	$V_{GS(F)}$	I_G = 1 mA , V_{DS} = 0 V	0.7							V
Dynamic										
Common-Source Forward Transconductance[c]	g_{fs}	V_{DG} = 20 V, I_D = 1 mA, f = 1 kHz	6							mS
Common-Source Output Conductance[c]	g_{os}		25							µS
Common-Source Input Capacitance	C_{iss}	V_{DS} = 0 V, V_{GS} = –10 V, f = 1 MHz	7		18		18		18	pF
Common-Source Reverse Transfer Capacitance	C_{rss}		3		8		8		8	
Equivalent Input Noise Voltage[c]	$\overline{e}_n$	V_{DG} = 10 V, I_D = 10 mA, f = 1 kHz	3							$\frac{nV}{\sqrt{Hz}}$
Switching										
Turn-On Time	$t_{d(on)}$	V_{DD} = 10 V, $V_{GS(H)}$ = 0 V, See Switching Circuit	2		6		6		10	ns
	t_r		2		3		4		10	
Turn-Off Time	t_{OFF}		13		25		50		100	

SPECIFICATIONS FOR 2N4859, 2N4860 AND 2N4861 (T_A = 25°C UNLESS NOTED)

Parameter	Symbol	Test Conditions	Typ[a]	Limits 2N4859 Min	2N4859 Max	2N4860 Min	2N4860 Max	2N4861 Min	2N4861 Max	Unit
Static										
Gate-Source Breakdown Voltage	$V_{(BR)GSS}$	I_G = –1 μA , V_{DS} = 0 V	–55	–30		–30		–30		V
Gate-Source Cutoff Voltage	$V_{GS(off)}$	V_{DS} = 15 V, I_D = 0.5 nA		–4	–10	–2	–6	–0.8	–4	
Saturation Drain Current[b]	I_{DSS}	V_{DS} = 15 V, V_{GS} = 0 V		50	175	20	100	8	80	mA
Gate Reverse Current	I_{GSS}	V_{GS} = –15 V, V_{DS} = 0 V	–5		–250		–250		–250	pA
		T_A = 150°C	–13		–500		–500		–500	nA
Gate Operating Current[c]	I_G	V_{DG} = 15 V, I_D = 10 mA	–5							pA
Drain Cutoff Current	$I_{D(off)}$	V_{DS} = 15 V, V_{GS} = –10 V	5		250		250		250	
		T_A = 150°C	13		500		500		500	nA
Drain-Source On-Voltage	$V_{DS(on)}$	V_{GS} = 0 V, I_D = 5 mA	0.25						0.5	V
		I_D = 10 mA	0.35				0.5			
		I_D = 20 mA	0.5		0.75					
Drain-Source On-Resistance	$r_{DS(on)}$	V_{GS} = 0 V, I_D = 1 mA			25		40		60	Ω
Gate-Source Forward Voltage	$V_{GS(F)}$	I_G = 1 mA , V_{DS} = 0 V	0.7							V
Dynamic										
Common-Source Forward Transconductance[c]	g_{fs}	V_{DG} = 20 V, I_D = 1 mA, f = 1 kHz	6							mS
Common-Source Output Conductance[c]	g_{os}		25							μS
Common-Source Input Capacitance	C_{iss}	V_{DS} = 0 V, V_{GS} = –10 V, f = 1 MHz	7		18		18		18	pF
Common-Source Reverse Transfer Capacitance	C_{rss}		3		8		8		8	
Equivalent Input Noise Voltage[c]	$\overline{e}_n$	V_{DG} = 10 V, I_D = 10 mA, f = 1 kHz	3							$nV/\sqrt{Hz}$
Switching										
Turn-On Time	$t_{d(on)}$	V_{DD} = 10 V, $V_{GS(H)}$ = 0 V, See Switching Circuit	2		6		6		10	ns
	t_r		2		3		4		10	
Turn-Off Time	t_{OFF}		19		25		50		100	

Notes
a. Typical values are for DESIGN AID ONLY, not guaranteed nor subject to production testing.
b. Pulse test: PW ≤ 100 μs duty cycle ≤ 10%.
c. This parameter not registered with JEDEC.

NCB

SWITCHING TIME TEST CIRCUIT			
	4856/4859	4857/4860	4858/4861
$V_{GS(L)}$	–10 V	–6 V	–4 V
R_L*	464 Ω	953 Ω	1910 Ω
$I_{D(on)}$	20 mA	10 mA	5 mA

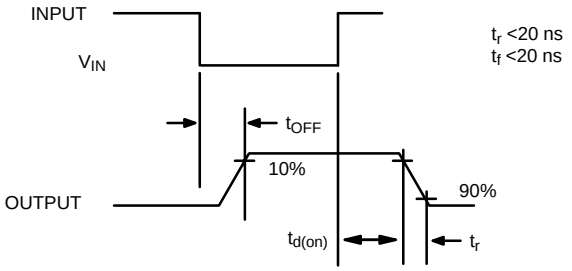
*Non-inductive

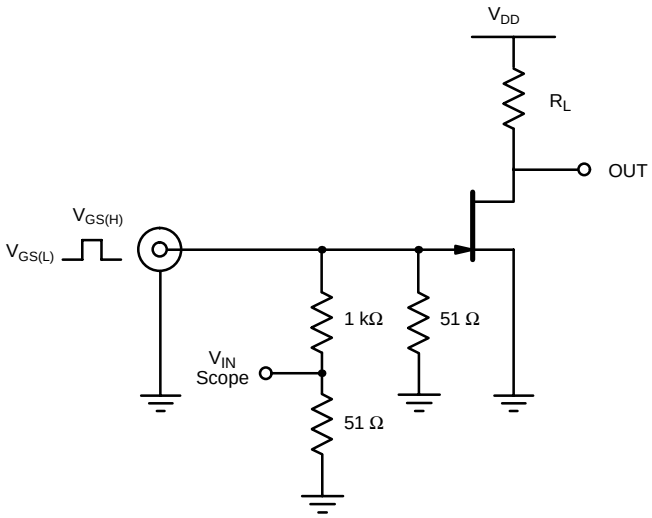
INPUT PULSE

Rise Time < 1 ns
Fall Time < 1 ns
Pulse Width 100 ns
PRF 1 MHz

SAMPLING SCOPE

Rise Time 0.4 ns
Input Resistance 10 MΩ
Input Capacitance 1.5 pF





Document Number: 70244
S-04028—Rev. C, 04-Jun-01

Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for JFET ***category:***

Click to view products by Vishay ***manufacturer:***

Other Similar products are found below :

MCH3914-8-TL-H F5606 2SK536-TB-E SMMBF4393LT1G 2SK2394-6-TB-E CPH3910-TL-E CPH5901F-TL-E CPH5901G-TL-E CPH5902H-TL-E 424147G TF202THC-4-TL-H MCH3914-7-TL-H MCH5908H-TL-E DSK5J01R0L CPH5902G-TL-E CPH5905G-TL-E CPH5905H-TL-E 2SK304E-SPA 2SK545-11D-TB-E 2SK771-5-TB-E 2SK2539-7-TB-E 2SK932-22-TB-E 2SK2394-7-TB-E NSVJ2394SA3T1G MMBFJ175LT3G SMPJ270TR 2SK208-GR(TE85L) MMBF4416 MMBF5103 MMBF5484 MMBFJ175 MMBFJ176 MMBFJ270 MMBF4393 NPT1004D 2SK1069-5-TL-E 2SA1781-6-TB-E NSVJ3910SB3T1G 2N5116 2N5116 CMPF4392 TR 2N4092 2N4093 CMPP6028 TR 2N4117 2N3958 SNJ450113 IFN3993 IFN5911 IFN406