
2SK1056, 2SK1057, 2SK1058

Silicon N-Channel MOS FET

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Application

Low frequency power amplifier

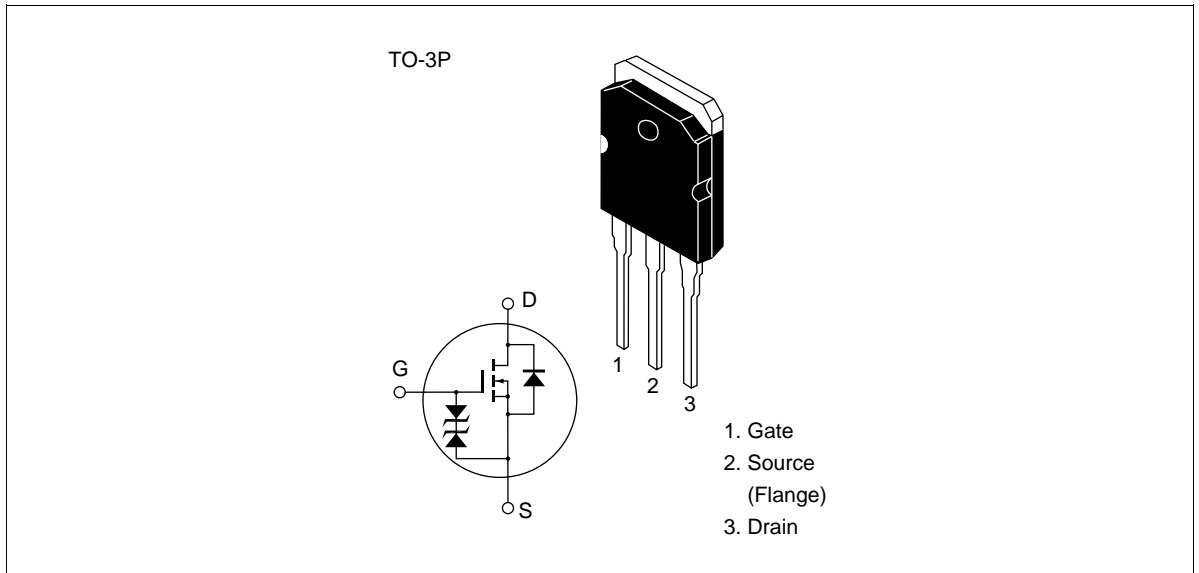
Complementary pair with 2SJ160, 2SJ161 and 2SJ162

Features

- Good frequency characteristic
- High speed switching
- Wide area of safe operation
- Enhancement-mode
- Good complementary characteristics
- Equipped with gate protection diodes
- Suitable for audio power amplifier

2SK1056, 2SK1057, 2SK1058

Outline



Absolute Maximum Ratings (Ta = 25°C)

Item		Symbol	Ratings	Unit
Drain to source voltage	2SK1056	V_{DSX}	120	V
	2SK1057		140	
	2SK1058		160	
Gate to source voltage		V_{GSS}	±15	V
Drain current		I_D	7	A
Body to drain diode reverse drain current		I_{DR}	7	A
Channel dissipation		P_{ch}^{*1}	100	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	-55 to +150	°C

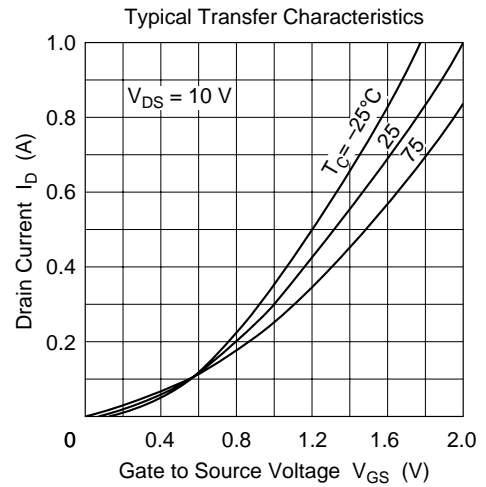
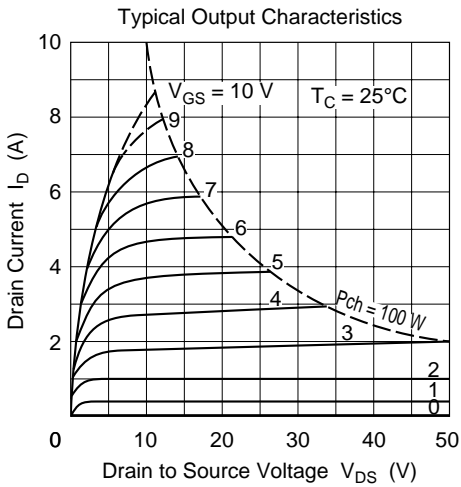
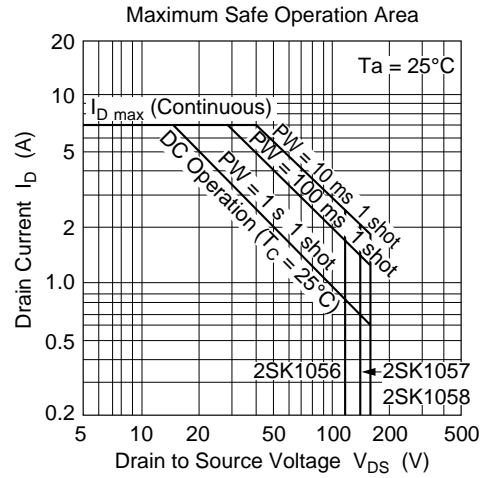
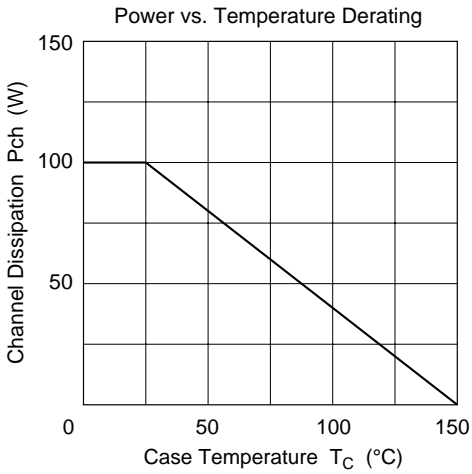
Note: 1. Value at $T_c = 25^\circ\text{C}$

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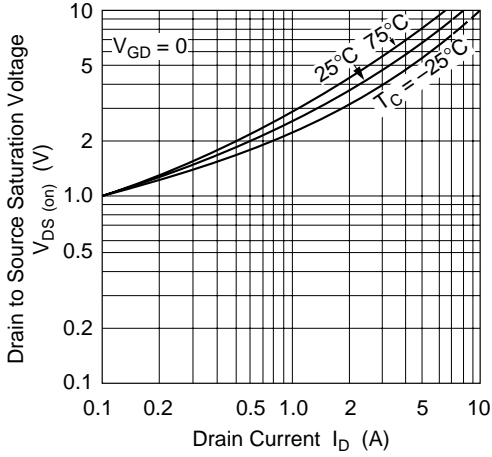
Electrical Characteristics (Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	2SK1056 $V_{(BR)DSX}$ 2SK1057 2SK1058	120 140 160	—	—	V	$I_D = 10 \text{ mA}, V_{GS} = -10 \text{ V}$
Gate to source breakdown voltage	$V_{(BR)GSS}$	± 15	—	—	V	$I_G = \pm 100 \mu\text{A}, V_{DS} = 0$
Gate to source cutoff voltage	$V_{GS(off)}$	0.15	—	1.45	V	$I_D = 100 \text{ mA}, V_{DS} = 10 \text{ V}$
Drain to source saturation voltage	$V_{DS(sat)}$	—	—	12	V	$I_D = 7 \text{ A}, V_{GD} = 0^{*1}$
Forward transfer admittance	yfs	0.7	1.0	1.4	S	$I_D = 3 \text{ A}, V_{DS} = 10 \text{ V}^{*1}$
Input capacitance	Ciss	—	600	—	pF	$V_{GS} = -5 \text{ V}, V_{DS} = 10 \text{ V},$ $f = 1 \text{ MHz}$
Output capacitance	Coss	—	350	—	pF	
Reverse transfer capacitance	Crss	—	10	—	pF	
Turn-on time	t_{on}	—	180	—	ns	$V_{DD} = 20 \text{ V}, I_D = 4 \text{ A},$
Turn-off time	t_{off}	—	60	—	ns	

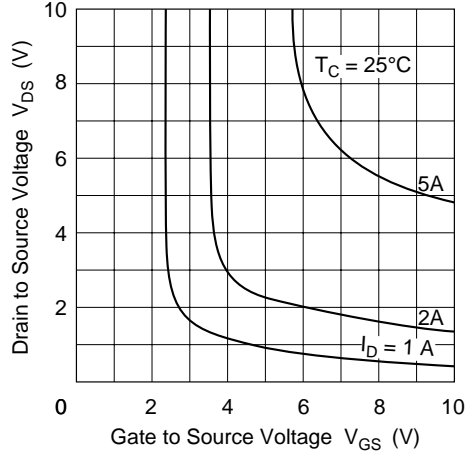
Note: 1. Pulse test



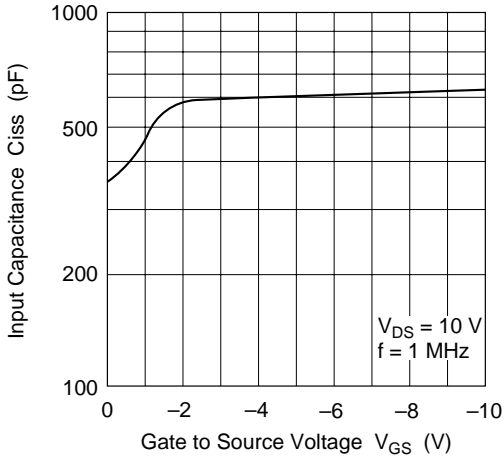
Drain to Source Saturation Voltage vs. Drain Current



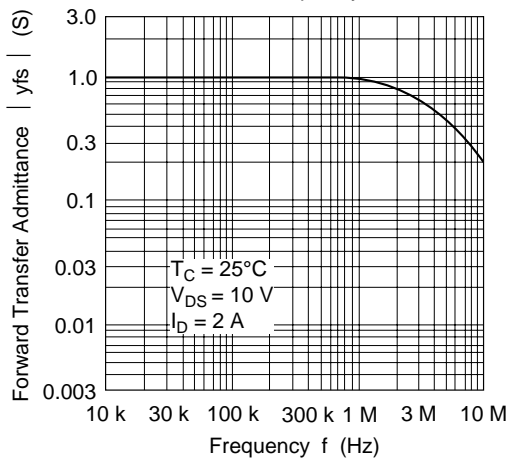
Drain to Source Voltage vs. Gate to Source Voltage

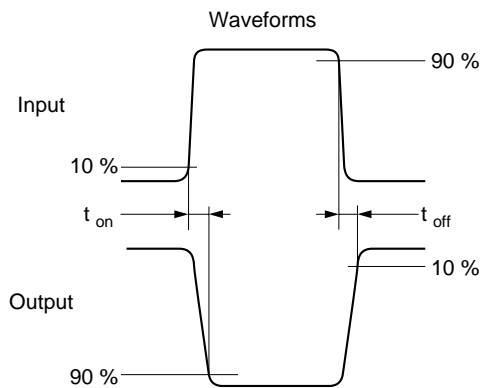
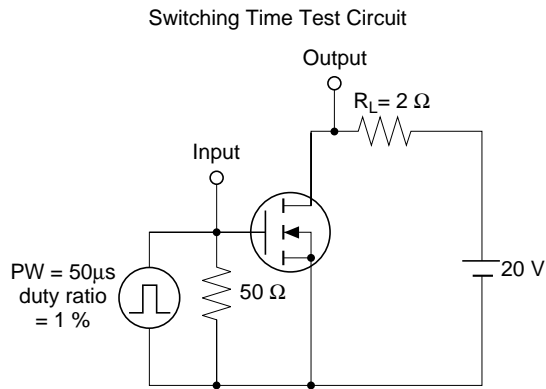
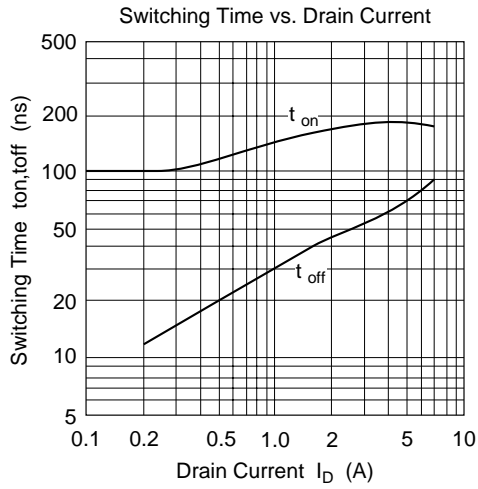


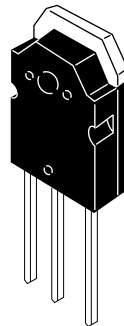
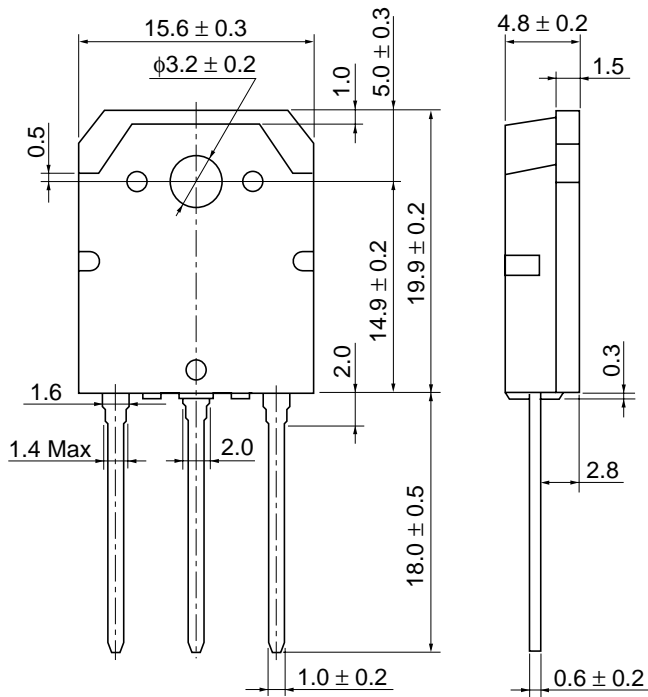
Input Capacitance vs. Gate Source Voltage



Forward Transfer Admittance vs. Frequency







Hitachi Code	TO-3P
JEDEC	—
EIAJ	Conforms
Weight (reference value)	5.0 g

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2SJ160, 2SJ161, 2SJ162

Silicon P-Channel MOS FET

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Application

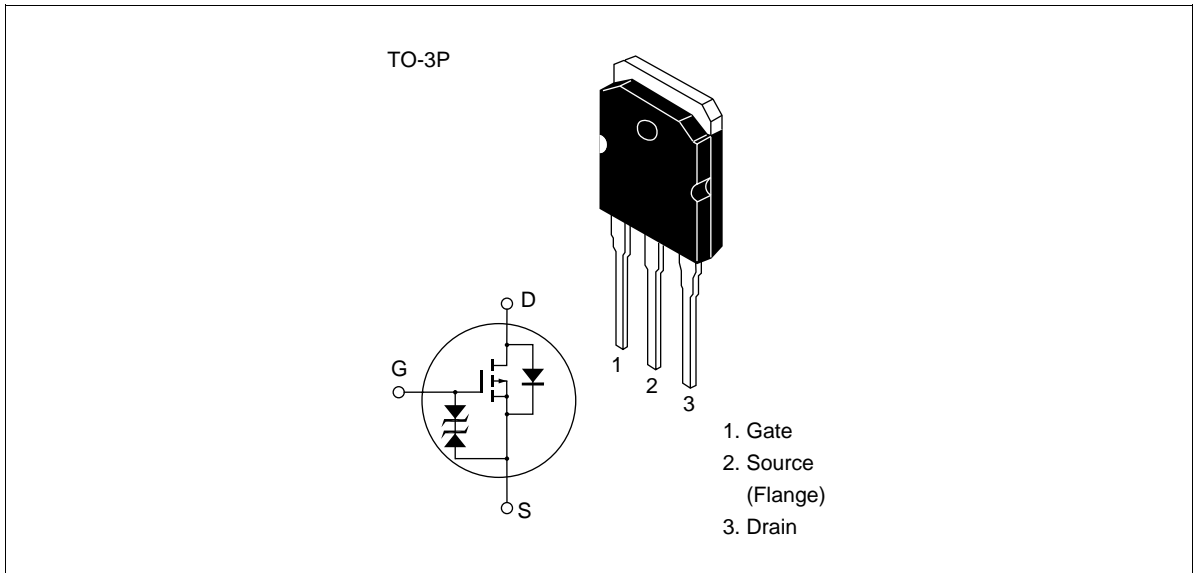
Low frequency power amplifier

Complementary pair with 2SK1056, 2SK1057 and 2SK1058

Features

- Good frequency characteristic
- High speed switching
- Wide area of safe operation
- Enhancement-mode
- Good complementary characteristics
- Equipped with gate protection diodes
- Suitable for audio power amplifier

Outline



Absolute Maximum Ratings (Ta = 25°C)

Item		Symbol	Ratings	Unit
Drain to source voltage	2SJ160	V_{DSX}	-120	V
	2SJ161		-140	
	2SJ162		-160	
Gate to source voltage		V_{GSS}	±15	V
Drain current		I_D	-7	A
Body to drain diode reverse drain current		I_{DR}	-7	A
Channel dissipation		P_{ch}^{*1}	100	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	-55 to +150	°C

Note: 1. Value at $T_c = 25^\circ\text{C}$

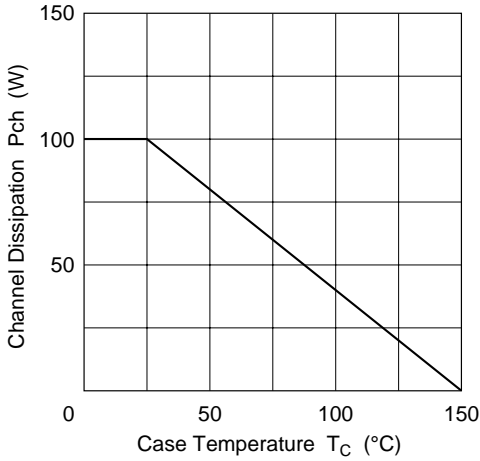
Electrical Characteristics (Ta = 25°C)

Item		Symbol	Min	Typ	Max	Unit	Test conditions
Drain to source breakdown voltage	2SJ160	$V_{(BR)DSX}$	-120	—	—	V	$I_D = -10 \text{ mA}, V_{GS} = 10 \text{ V}$
	2SJ161		-140	—	—	V	
	2SJ162		-160	—	—	V	
Gate to source breakdown voltage		$V_{(BR)GSS}$	± 15	—	—	V	$I_G = \pm 100 \mu\text{A}, V_{DS} = 0$
Gate to source cutoff voltage		$V_{GS(off)}$	-0.15	—	-1.45	V	$I_D = -100 \text{ mA}, V_{DS} = -10 \text{ V}$
Drain to source saturation voltage		$V_{DS(sat)}$	—	—	-12	V	$I_D = -7 \text{ A}, V_{GD} = 0^{*1}$
Forward transfer admittance		$ y_{fs} $	0.7	1.0	1.4	S	$I_D = -3 \text{ A}, V_{DS} = -10 \text{ V}^{*1}$
Input capacitance		C_{iss}	—	900	—	pF	$V_{GS} = 5 \text{ V}, V_{DS} = -10 \text{ V},$
Output capacitance		C_{oss}	—	400	—	pF	$f = 1 \text{ MHz}$
Reverse transfer capacitance		C_{rss}	—	40	—	pF	
Turn-on time		t_{on}	—	230	—	ns	$V_{DD} = -20 \text{ V}, I_D = -4 \text{ A}$
Turn-off time		t_{off}	—	110	—	ns	

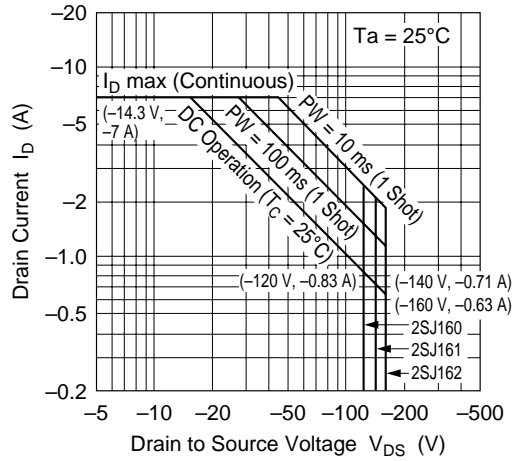
Note: 1. Pulse test

2SJ160, 2SJ161, 2SJ162

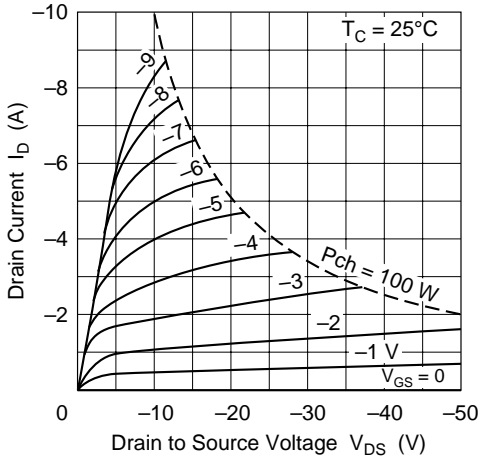
Power vs. Temperature Derating



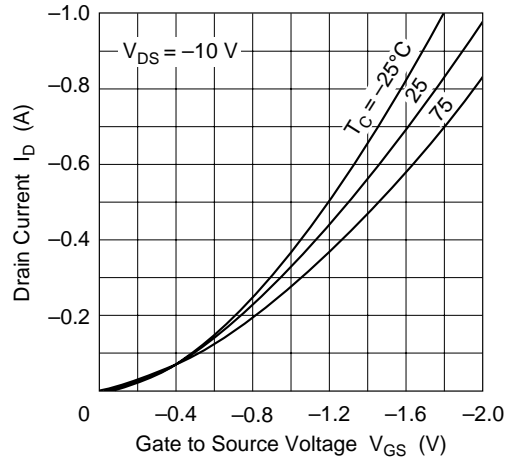
Maximum Safe Operation Area



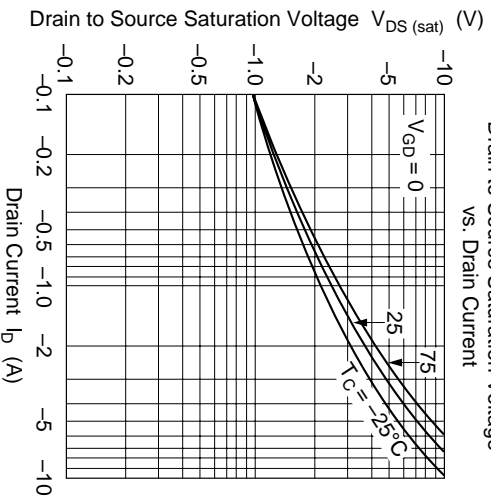
Typical Output Characteristics



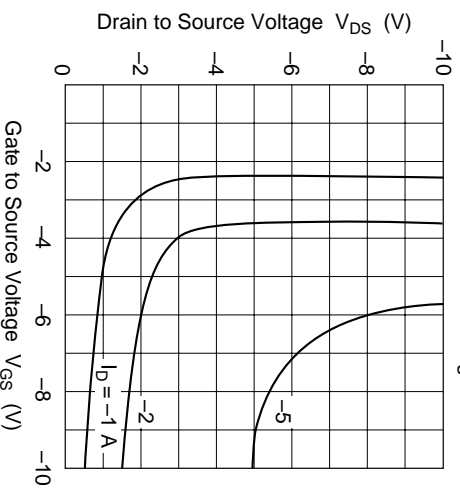
Typical Transfer Characteristics



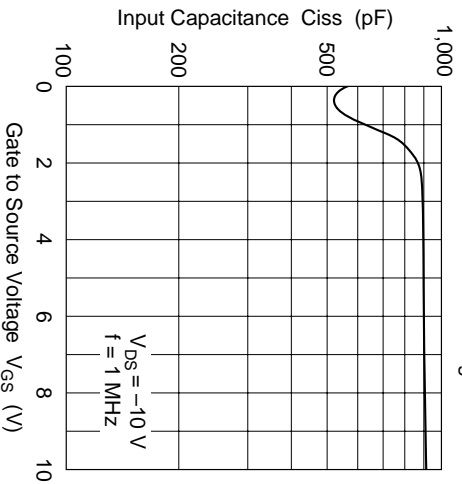
Drain to Source Saturation Voltage $V_{DS(sat)}$ vs. Drain Current



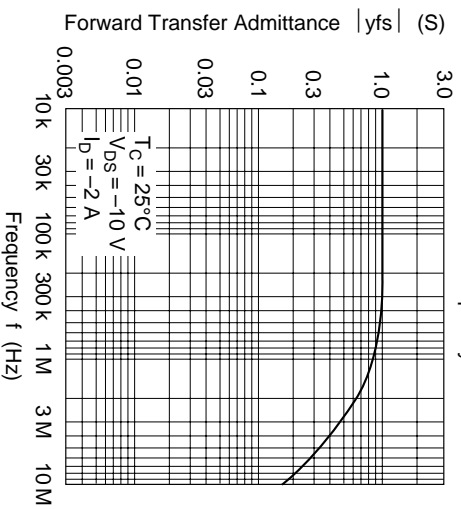
Drain to Source Voltage V_{DS} vs. Gate to Source Voltage V_{GS}

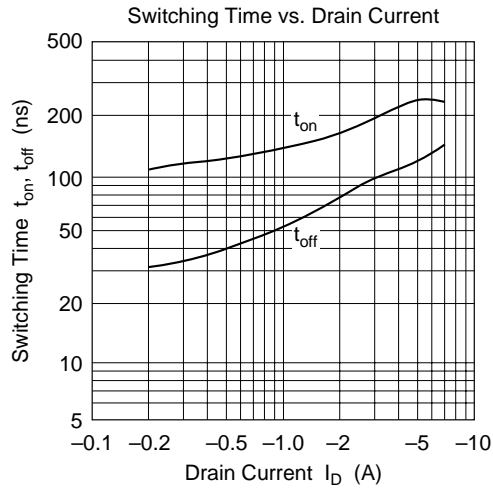


Input Capacitance vs. Gate to Source Voltage

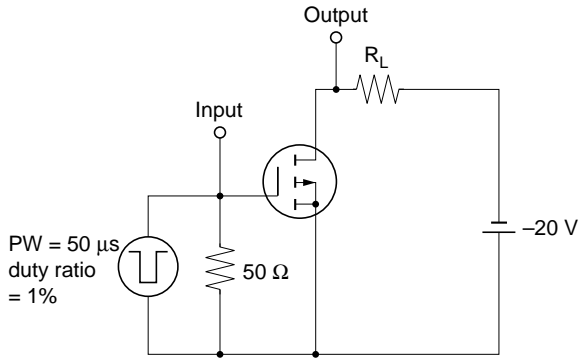


Forward Transfer Admittance vs. Frequency

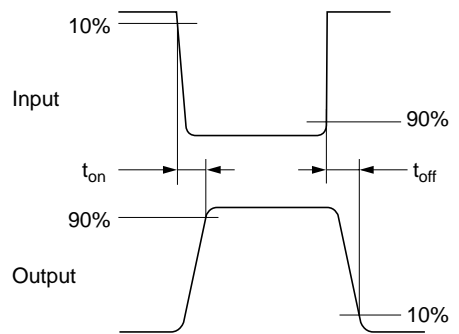


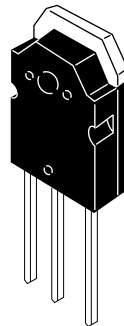
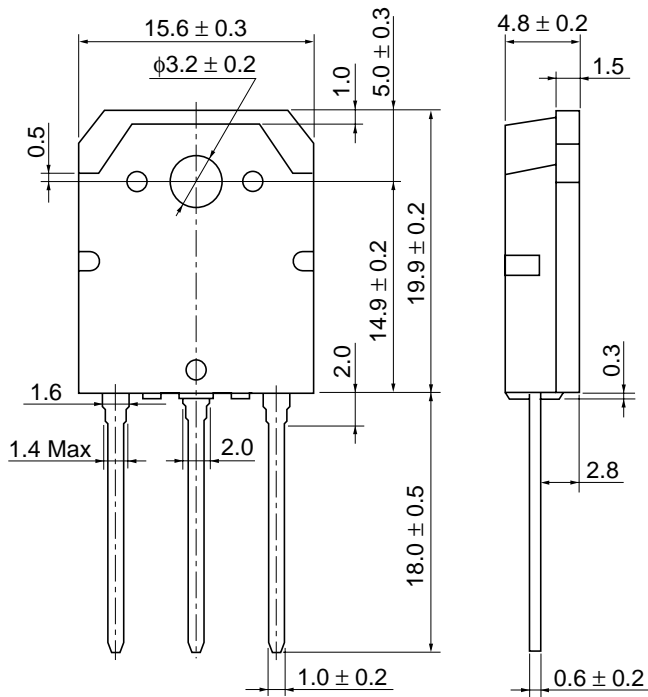


Switching Time Test Circuit



Waveforms





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EIAJ	Conforms
Weight (reference value)	5.0 g

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