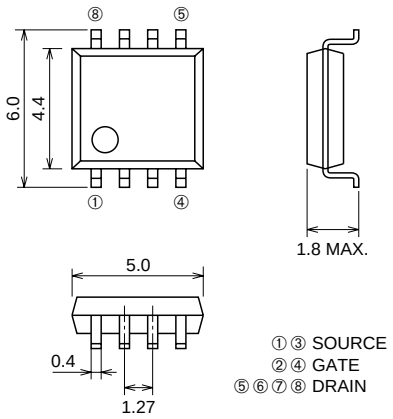
FY5AEJ-03

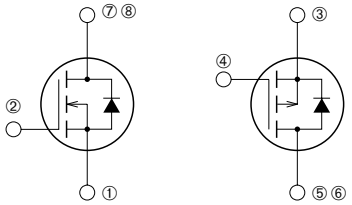
HIGH-SPEED SWITCHING USE
Nch/Pch POWER MOSFET

FY5AEJ-03

- 4V DRIVE
- V_{DSS} ..... ±30V
- $r_{DS\ (ON)\ (MAX)}$ 30/65mΩ
- I_D 5/–4A

OUTLINE DRAWING Dimensions in mm





SOP-8

APPLICATION

Motor control, Lamp control, Solenoid control,
DC-DC converter, Li-ionbattery, notebook p/c, etc

MAXIMUM RATINGS (Tc = 25°C)

Symbol	Parameter	Conditions	Ratings		Unit
			n-ch	p-ch	
V_{DSS}	Drain-source voltage	V_{GS} = 0V	30	–30	V
V_{GSS}	Gate-source voltage	V_{DS} = 0V	±20	±20	V
I_D	Drain current		5	–4	A
I_{DM}	Drain current (Pulsed)		35	–28	A
I_{DA}	Avalanche current (Pulsed)	L = 10µH	5	–4	A
I_S	Source current		1.5	–1.5	A
I_{SM}	Source current (Pulsed)		6.0	–6.0	A
P_D	Maximum power dissipation		1.6	1.7	W
T_{ch}	Channel temperature		–55~+150		°C
T_{stg}	Storage temperature		–55~+150		°C
—	Weight	Typical value	0.07		g

RENESAS
Renesas Technology Corp.

FY5AEJ-03

HIGH-SPEED SWITCHING USE
Nch/Pch POWER MOSFET

ELECTRICAL CHARACTERISTICS (Tch = 25°C)

N-ch

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
$V_{(BR)\ DSS}$	Drain-source breakdown voltage	I_D = 1mA, V_{GS} = 0V	30	—	—	V
I_{GSS}	Gate-source leakage current	V_{GS} = ±20V, V_{DS} = 0V	—	—	±0.1	µA
I_{DSS}	Drain-source leakage current	V_{DS} = 30V, V_{GS} = 0V	—	—	0.1	mA
$V_{GS\ (th)}$	Gate-source threshold voltage	I_D = 1mA, V_{DS} = 10V	1.0	1.5	2.0	V
$r_{DS\ (ON)}$	Drain-source on-state resistance	I_D = 5A, V_{GS} = 10V	—	23	30	mΩ
$r_{DS\ (ON)}$	Drain-source on-state resistance	I_D = 2A, V_{GS} = 4V	—	40	55	mΩ
$\lvert y_{fs} \rvert$	Forward transfer admittance	I_D = 5A, V_{DS} = 10V	—	9	—	S
C_{iss}	Input capacitance	V_{DS} = 10V, V_{GS} = 0V, f = 1MHz	—	550	—	pF
C_{oss}	Output capacitance		—	220	—	pF
C_{rss}	Reverse transfer capacitance		—	115	—	pF
$t_{d\ (on)}$	Turn-on delay time	V_{DD} = 15V, I_D = 2A, V_{GS} = 10V, R_{GEN} = R_{GS} = 50Ω	—	12	—	ns
t_r	Rise time		—	20	—	ns
$t_{d\ (off)}$	Turn-off delay time		—	40	—	ns
t_f	Fall time		—	40	—	ns
V_{SD}	Source-drain voltage	I_S = 1.5A, V_{GS} = 0V	—	0.75	1.10	V
$R_{th\ (ch-a)}$	Thermal resistance	Channel to ambiet	—	—	78.1	°C/W
t_{rr}	Reverse recovery time	I_S = 1.5A, di_S/dt = –50A/µs	—	100	—	ns

P-ch

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
$V_{(BR)\ DSS}$	Drain-source breakdown voltage	I_D = 1mA, V_{GS} = 0V	–30	—	—	V
I_{GSS}	Gate-source leakage current	V_{GS} = ±20V, V_{DS} = 0V	—	—	±0.1	µA
I_{DSS}	Drain-source leakage current	V_{DS} = –30V, V_{GS} = 0V	—	—	–0.1	mA
$V_{GS\ (th)}$	Gate-source threshold voltage	I_D = –1mA, V_{DS} = –10V	–1.5	–2.0	–2.5	V
$r_{DS\ (ON)}$	Drain-source on-state resistance	I_D = –4A, V_{GS} = –10V	—	50	65	mΩ
$r_{DS\ (ON)}$	Drain-source on-state resistance	I_D = –2A, V_{GS} = –4V	—	90	135	mΩ
$\lvert y_{fs} \rvert$	Forward transfer admittance	I_D = –4A, V_{DS} = –10V	—	6	—	S
C_{iss}	Input capacitance	V_{DS} = –10V, V_{GS} = 0V, f = 1MHz	—	870	—	pF
C_{oss}	Output capacitance		—	230	—	pF
C_{rss}	Reverse transfer capacitance		—	110	—	pF
$t_{d\ (on)}$	Turn-on delay time	V_{DD} = –15V, I_D = –2A, V_{GS} = –10V, R_{GEN} = R_{GS} = 50Ω	—	10	—	ns
t_r	Rise time		—	10	—	ns
$t_{d\ (off)}$	Turn-off delay time		—	60	—	ns
t_f	Fall time		—	30	—	ns
V_{SD}	Source-drain voltage	I_S = –1.5A, V_{GS} = 0V	—	–0.88	–1.20	V
$R_{th\ (ch-a)}$	Thermal resistance	Channel to ambiet	—	—	73.5	°C/W
t_{rr}	Reverse recovery time	I_S =1.5A, di_S/dt = 50A/µs	—	100	—	ns

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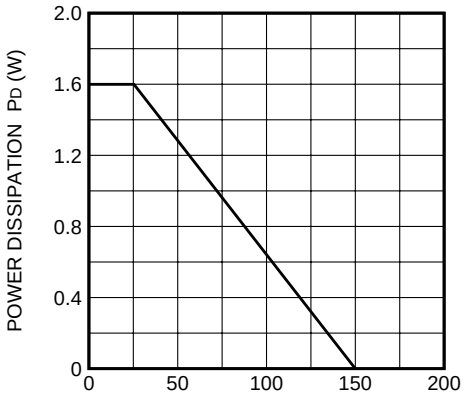
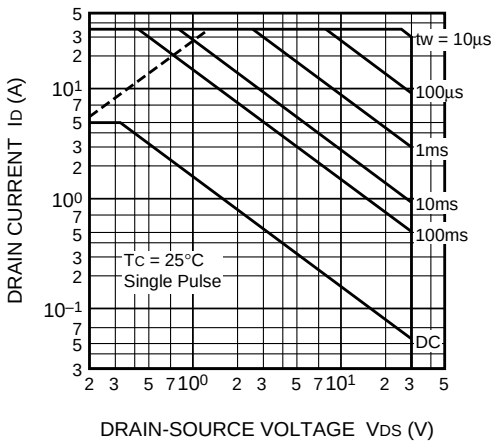
HIGH-SPEED SWITCHING USE
Nch/Pch POWER MOSFET

PERFORMANCE CURVES (N-ch)

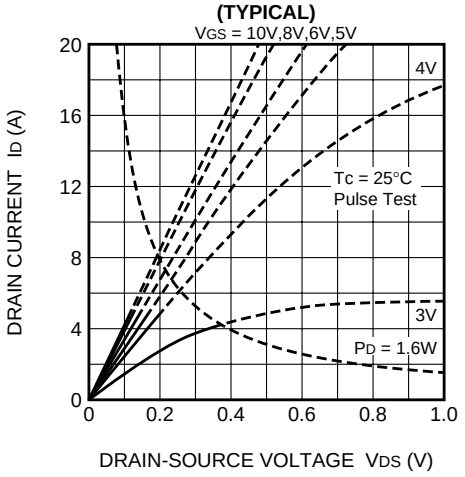
POWER DISSIPATION DERATING CURVE



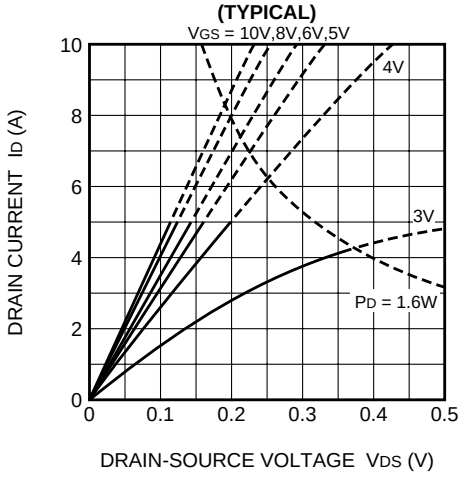
MAXIMUM SAFE OPERATING AREA



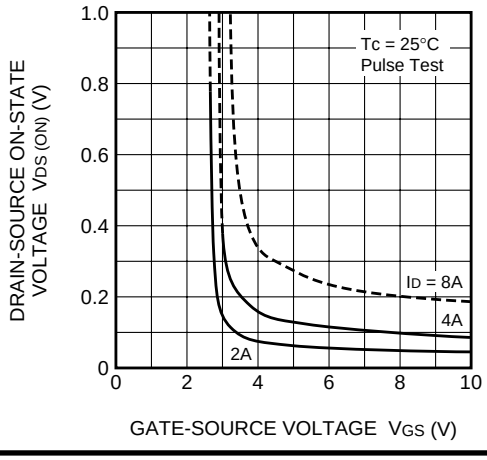
OUTPUT CHARACTERISTICS (TYPICAL)



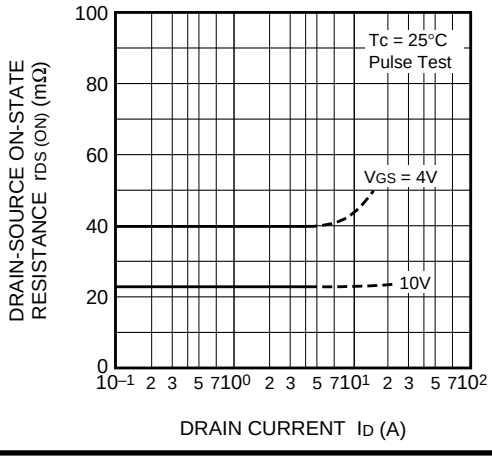
OUTPUT CHARACTERISTICS (TYPICAL)



ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)



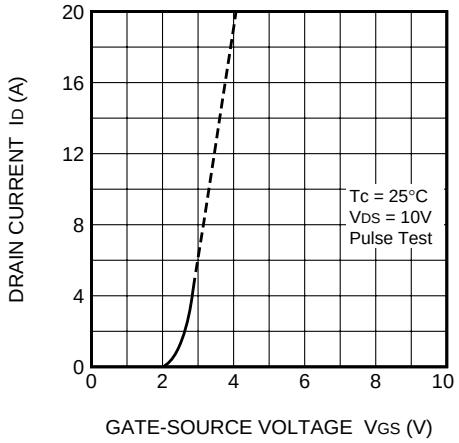
ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)



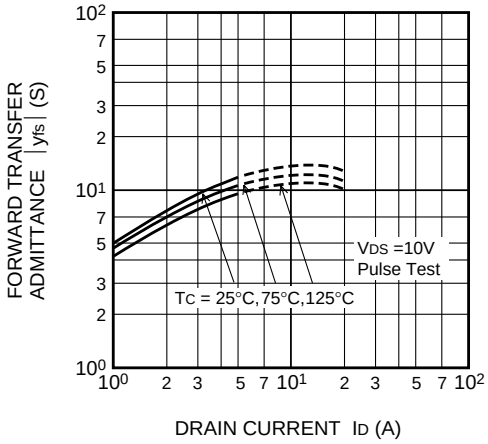
FY5AEJ-03

HIGH-SPEED SWITCHING USE
Nch/Pch POWER MOSFET

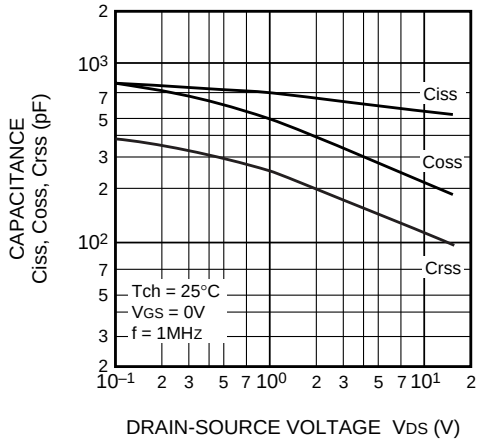
TRANSFER CHARACTERISTICS (TYPICAL)



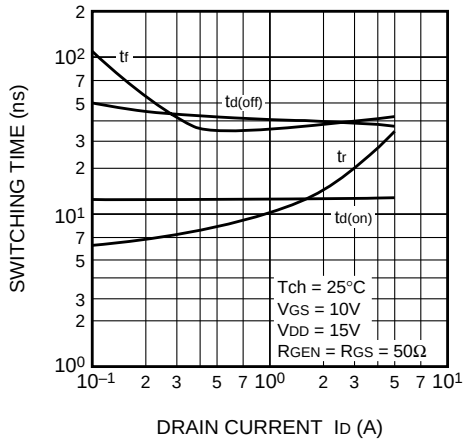
FORWARD TRANSFER ADMITTANCE VS.DRAIN CURRENT (TYPICAL)



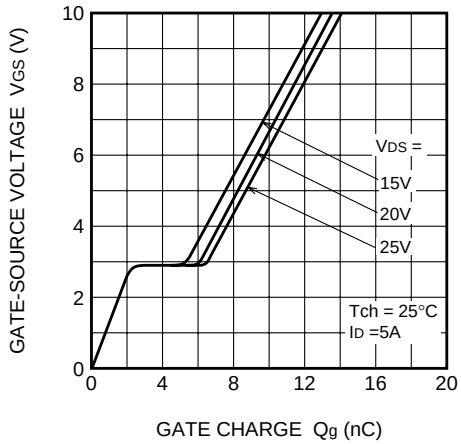
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)



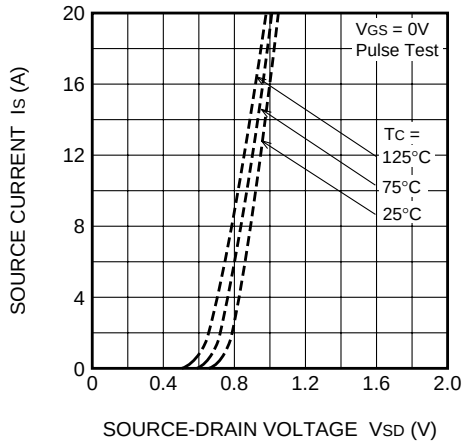
SWITCHING CHARACTERISTICS (TYPICAL)



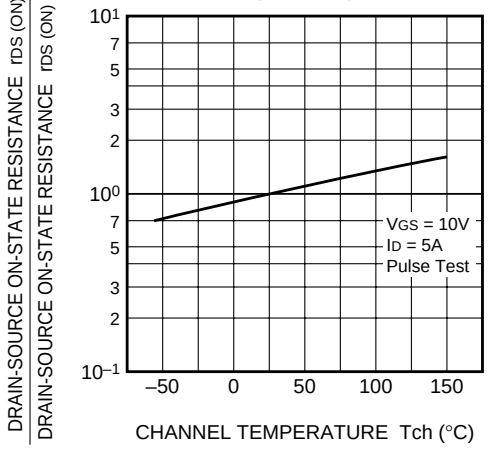
GATE-SOURCE VOLTAGE VS.GATE CHARGE (TYPICAL)



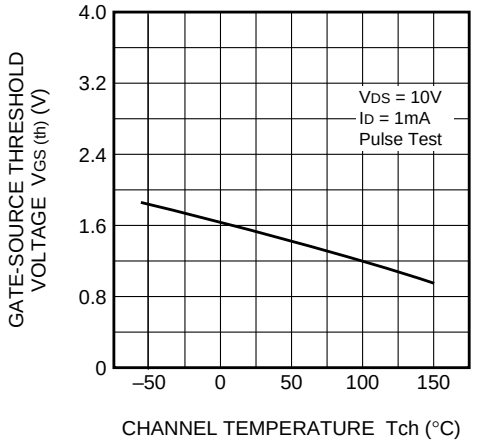
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



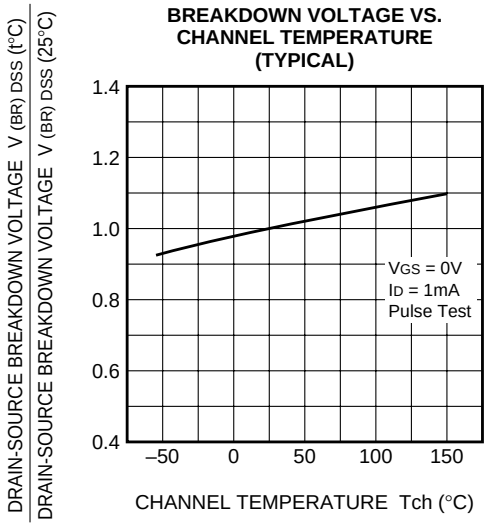
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



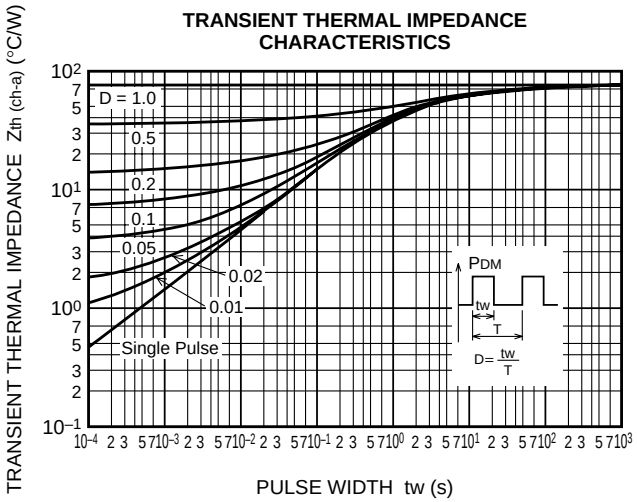
THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS

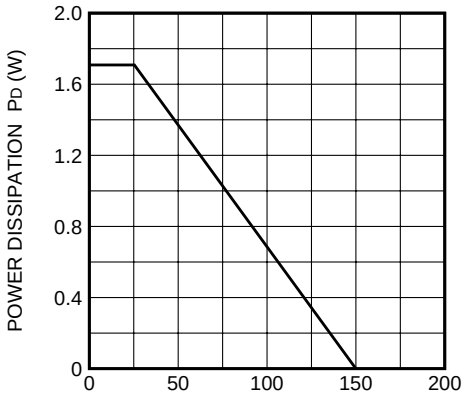


FY5AEJ-03

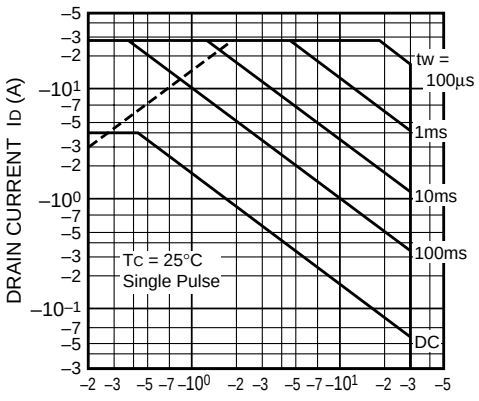
HIGH-SPEED SWITCHING USE
Nch/Pch POWER MOSFET

PERFORMANCE CURVES (P-ch)

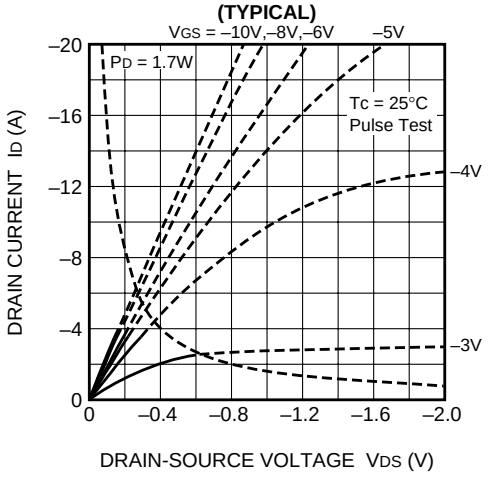
POWER DISSIPATION DERATING CURVE



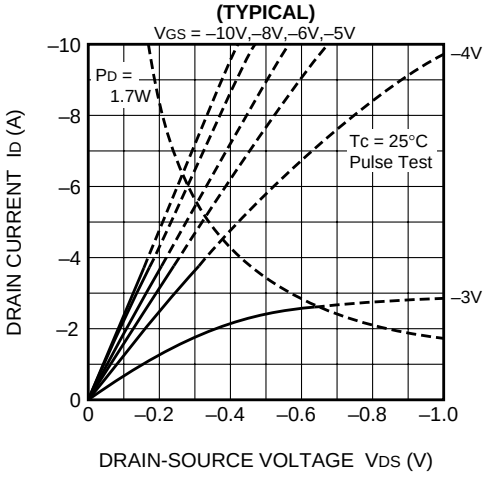
MAXIMUM SAFE OPERATING AREA



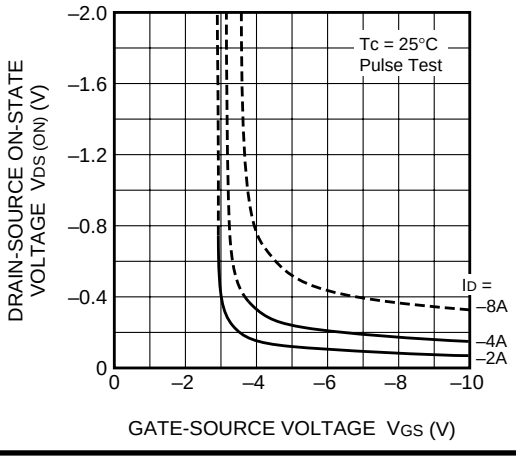
OUTPUT CHARACTERISTICS (TYPICAL)



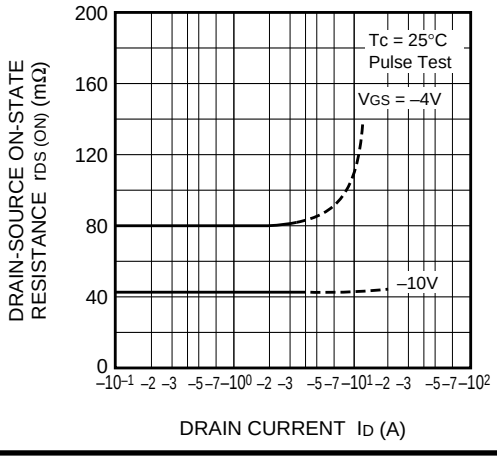
OUTPUT CHARACTERISTICS (TYPICAL)



ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)



ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)



PRELIMINARY
Notice: This is not a final specification.
Some parametric limits are subject to change.

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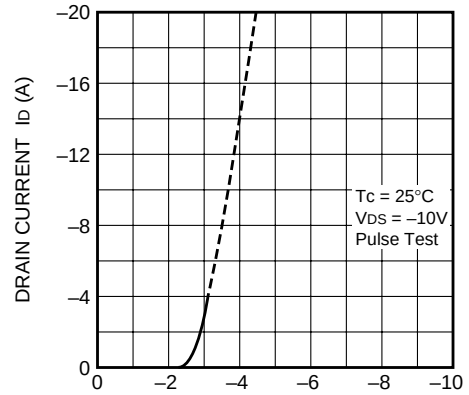
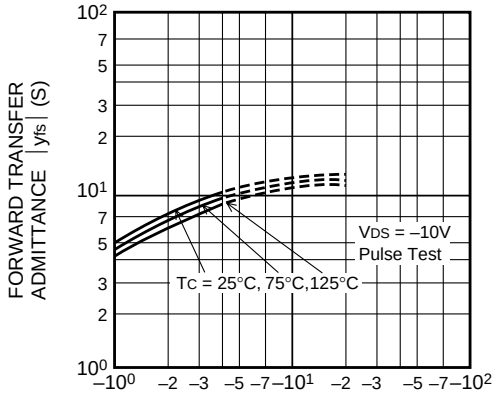
HIGH-SPEED SWITCHING USE
Nch/Pch POWER MOSFET

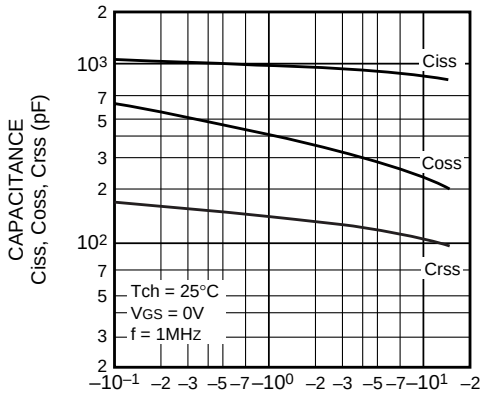
TRANSFER CHARACTERISTICS (TYPICAL)



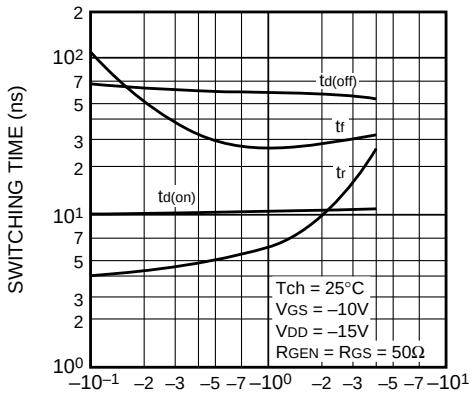
FORWARD TRANSFER ADMITTANCE VS.DRAIN CURRENT (TYPICAL)



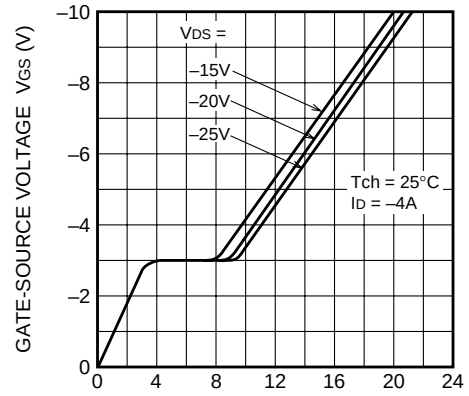
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)



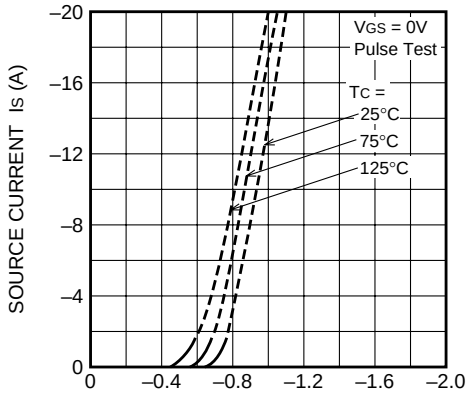
SWITCHING CHARACTERISTICS (TYPICAL)



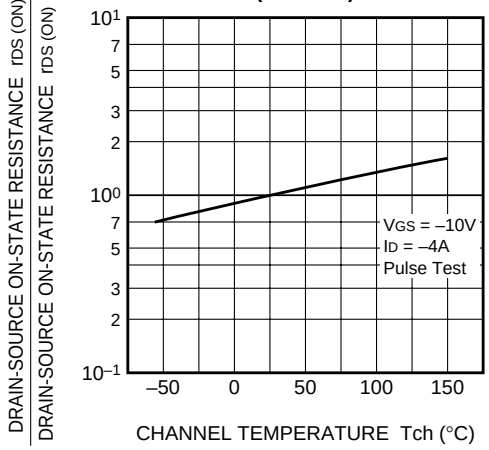
GATE-SOURCE VOLTAGE VS.GATE CHARGE (TYPICAL)



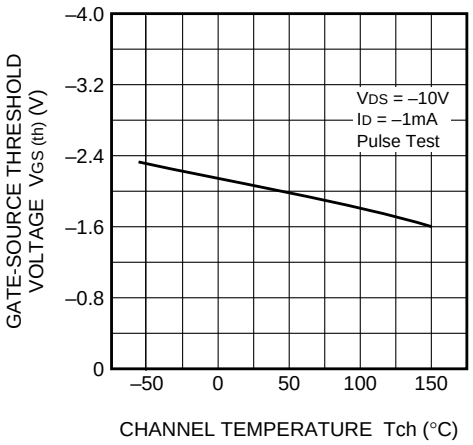
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



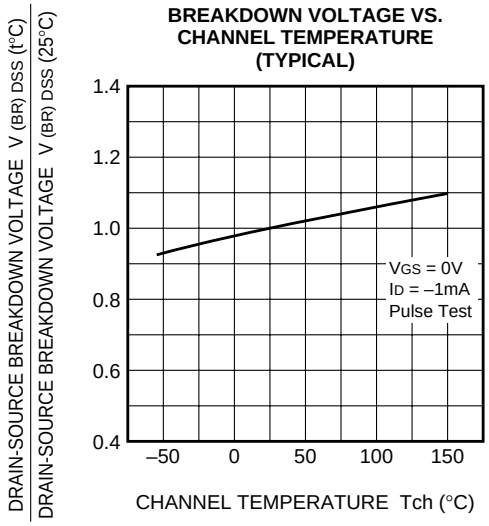
ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)



THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS