To all our customers

Regarding the change of names mentioned in the document, such as Mitsubishi Electric and Mitsubishi XX, to Renesas Technology Corp.

The semiconductor operations of Hitachi and Mitsubishi Electric were transferred to Renesas Technology Corporation on April 1st 2003. These operations include microcomputer, logic, analog and discrete devices, and memory chips other than DRAMs (flash memory, SRAMs etc.) Accordingly, although Mitsubishi Electric, Mitsubishi Electric Corporation, Mitsubishi Semiconductors, and other Mitsubishi brand names are mentioned in the document, these names have in fact all been changed to Renesas Technology Corp. Thank you for your understanding. Except for our corporate trademark, logo and corporate statement, no changes whatsoever have been made to the contents of the document, and these changes do not constitute any alteration to the contents of the document itself.

Note : Mitsubishi Electric will continue the business operations of high frequency & optical devices and power devices.

Not recommend for new design

Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

MITSUBISHI Nch POWER MOSFET

FK7VS-12

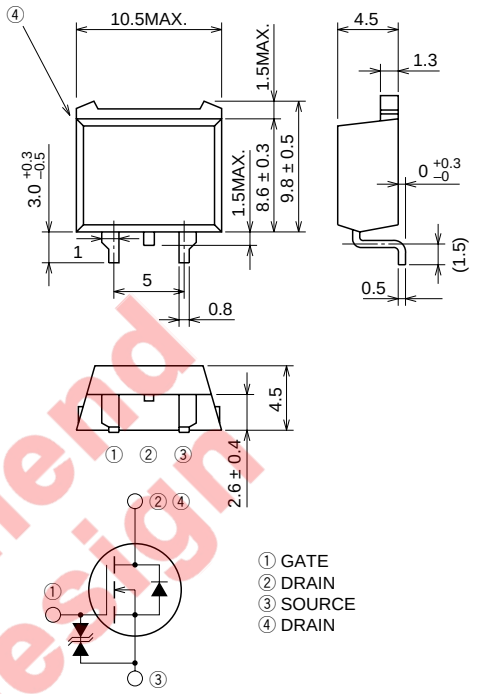
HIGH-SPEED SWITCHING USE

FK7VS-12



- V_{DSS} 600V
- $r_{DS\ (ON)\ (MAX)}$ 1.63Ω
- I_D 7A
- Integrated Fast Recovery Diode (MAX.) 150ns

OUTLINE DRAWING Dimensions in mm



TO-220S

Not recommend for new design

APPLICATION

Servo motor drive, Robot, UPS, Inverter Fluorecent lamp, etc.

MAXIMUM RATINGS (T_C = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
V_{DSS}	Drain-source voltage	V_{GS} = 0V	600	V
V_{GSS}	Gate-source voltage	V_{DS} = 0V	±30	V
I_D	Drain current		7	A
I_{DM}	Drain current (Pulsed)		21	A
I_S	Source current		7	A
I_{SM}	Source current (Pulsed)		21	A
P_D	Maximum power dissipation		125	W
T_{ch}	Channel temperature		–55 ~ +150	°C
T_{stg}	Storage temperature		–55 ~ +150	°C
—	Weight	Typical value	1.2	g

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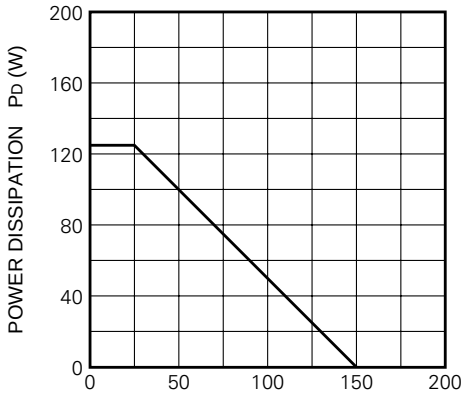
ELECTRICAL CHARACTERISTICS (Tch = 25°C)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
$V_{(BR)DSS}$	Drain-source breakdown voltage	I_D = 1mA, V_{GS} = 0V	600	—	—	V
$V_{(BR)GSS}$	Gate-source breakdown voltage	I_G = ±100µA, V_{DS} = 0V	±30	—	—	V
I_{GSS}	Gate-source leakage current	V_{GS} = ±25V, V_{DS} = 0V	—	—	±10	µA
I_{DSS}	Drain-source leakage current	V_{DS} = 600V, V_{GS} = 0V	—	—	1	mA
$V_{GS(th)}$	Gate-source threshold voltage	I_D = 1mA, V_{DS} = 10V	2	3	4	V
$r_{DS(ON)}$	Drain-source on-state resistance	I_D = 3A, V_{GS} = 10V	—	1.25	1.63	Ω
$V_{DS(ON)}$	Drain-source on-state voltage	I_D = 3A, V_{GS} = 10V	—	3.75	4.89	V
$\|y_{fs}\|$	Forward transfer admittance	I_D = 3A, V_{DS} = 10V	3.3	5.5	—	S
C_{iss}	Input capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz	—	1100	—	pF
C_{oss}	Output capacitance		—	125	—	pF
C_{rss}	Reverse transfer capacitance		—	17	—	pF
$t_{d(on)}$	Turn-on delay time	V_{DD} = 200V, I_D = 3A, V_{GS} = 10V, R_{GEN} = R_{GS} = 50Ω	—	30	—	ns
t_r	Rise time		—	30	—	ns
$t_{d(off)}$	Turn-off delay time		—	100	—	ns
t_f	Fall time		—	35	—	ns
V_{SD}	Source-drain voltage	I_S = 3A, V_{GS} = 0V	—	1.5	2.0	V
$R_{th(ch-c)}$	Thermal resistance	Channel to case	—	—	1.0	°C/W
t_{rr}	Reverse recovery time	I_S = 7A, di_S/dt = –100A/µs	—	—	150	ns

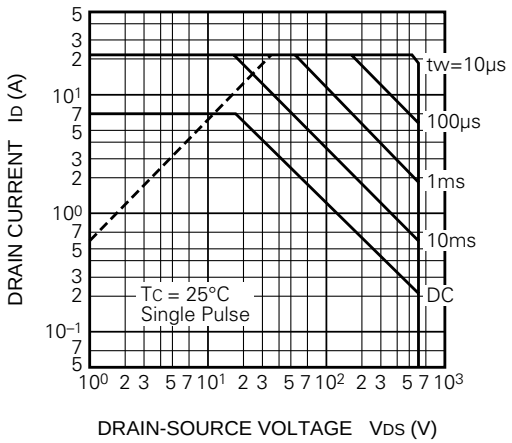
Not recommend for new design

PERFORMANCE CURVES

POWER DISSIPATION DERATING CURVE

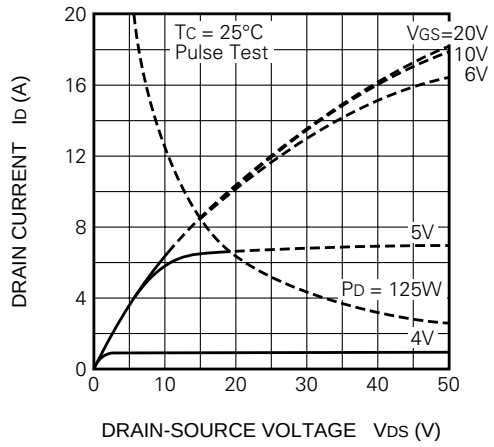


MAXIMUM SAFE OPERATING AREA

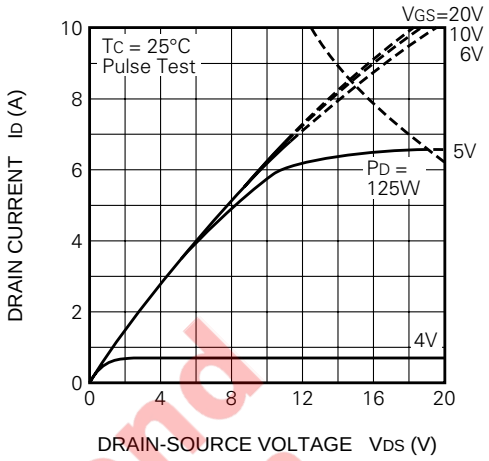


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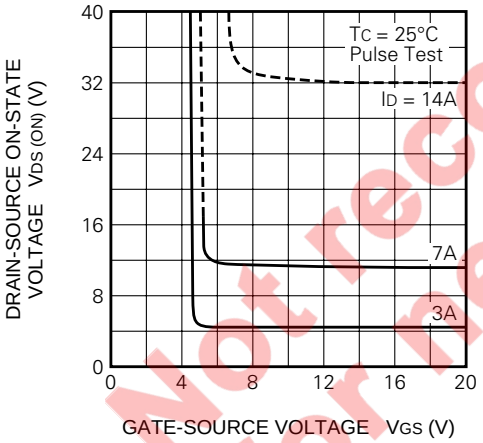
OUTPUT CHARACTERISTICS (TYPICAL)



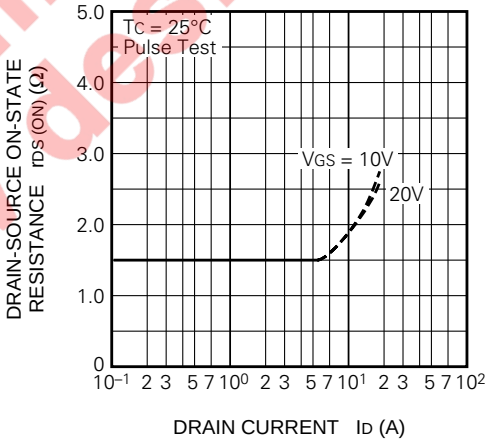
OUTPUT CHARACTERISTICS (TYPICAL)



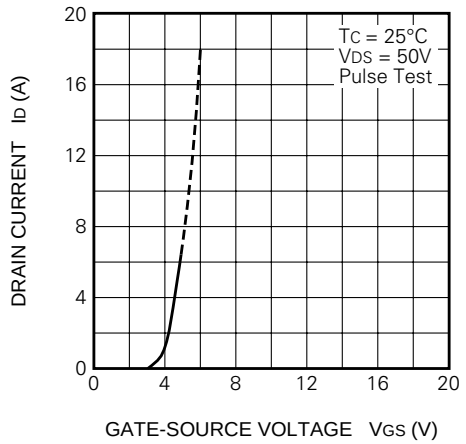
ON-STATE VOLTAGE VS. GATE-SOURCE VOLTAGE (TYPICAL)



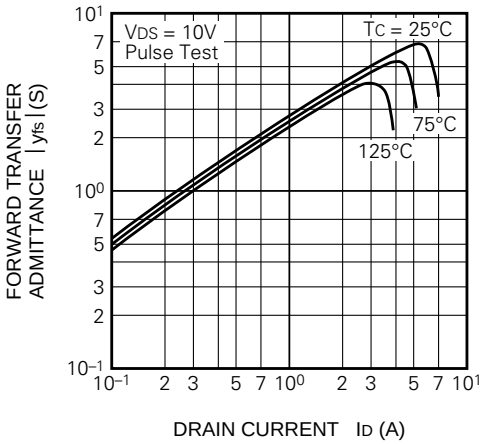
ON-STATE RESISTANCE VS. DRAIN CURRENT (TYPICAL)



TRANSFER CHARACTERISTICS (TYPICAL)

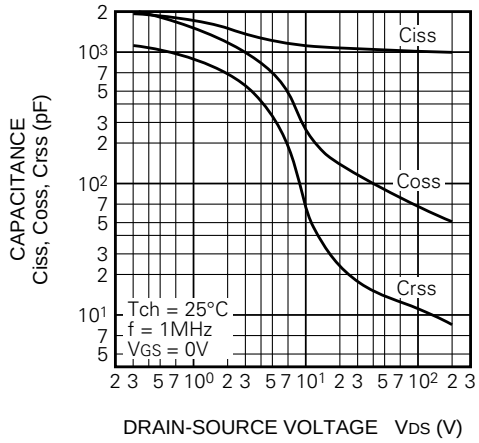


FORWARD TRANSFER ADMITTANCE VS.DRAIN CURRENT (TYPICAL)

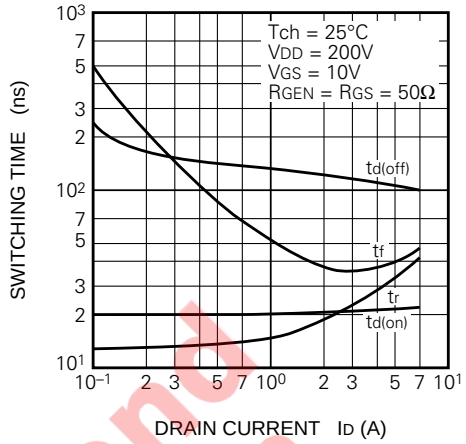


Not recommend for new design

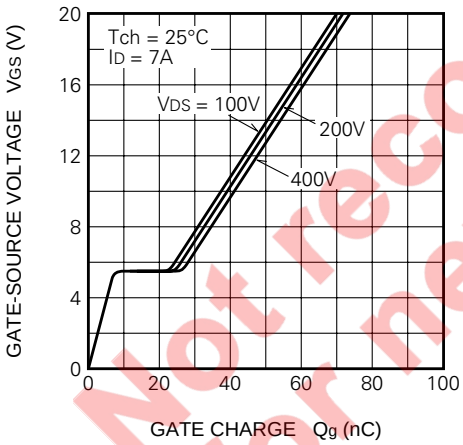
CAPACITANCE VS. DRAIN-SOURCE VOLTAGE (TYPICAL)



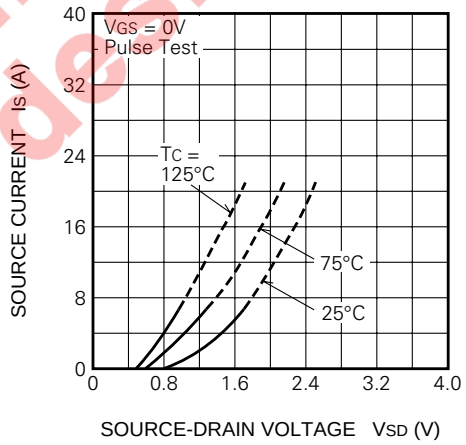
SWITCHING CHARACTERISTICS (TYPICAL)



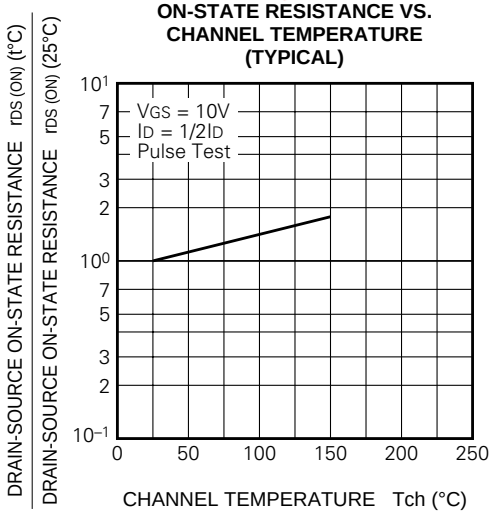
GATE-SOURCE VOLTAGE VS.GATE CHARGE (TYPICAL)



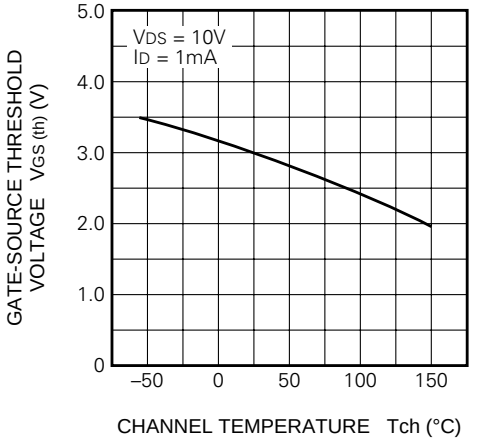
SOURCE-DRAIN DIODE FORWARD CHARACTERISTICS (TYPICAL)



ON-STATE RESISTANCE VS. CHANNEL TEMPERATURE (TYPICAL)

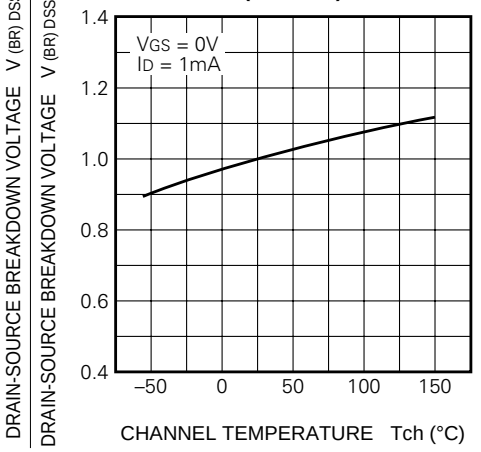


THRESHOLD VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)

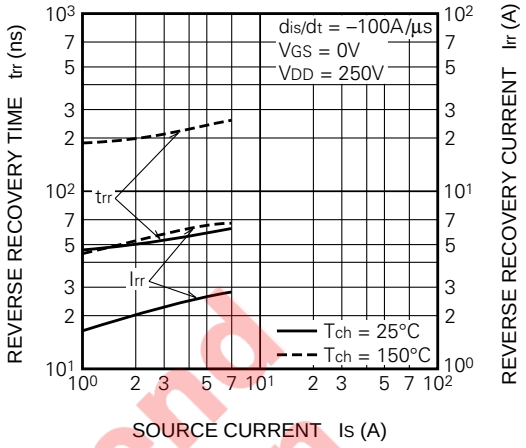


Not recommend for new design

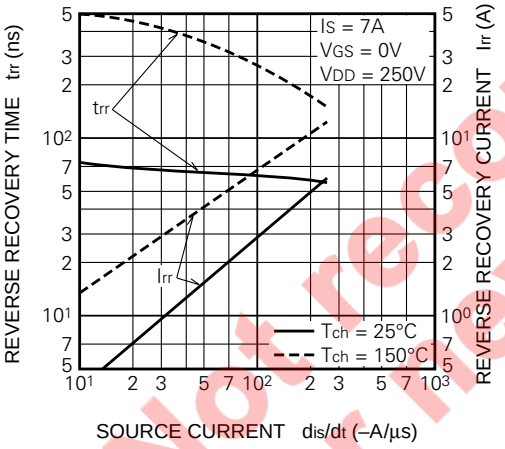
BREAKDOWN VOLTAGE VS. CHANNEL TEMPERATURE (TYPICAL)



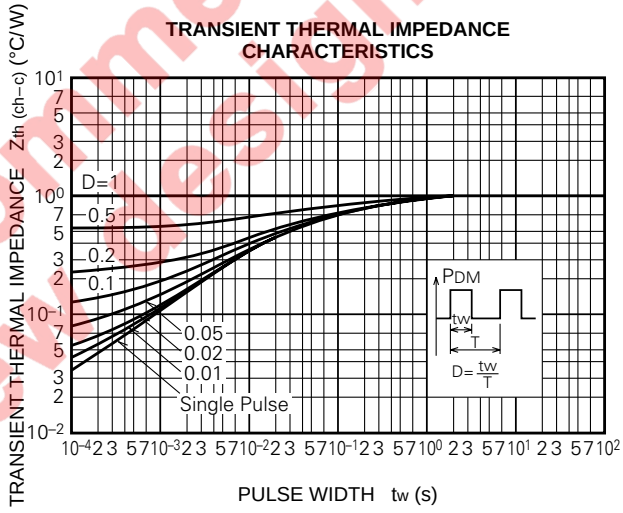
DIODE REVERSE VS. SOURCE CURRENT CHARACTERISTIC (TYPICAL)



DIODE REVERSE VS. SOURCE CURRENT dis/dt CHARACTERISTIC (TYPICAL)



TRANSIENT THERMAL IMPEDANCE CHARACTERISTICS



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