

FK14VS-9

HIGH-SPEED SWITCHING USE

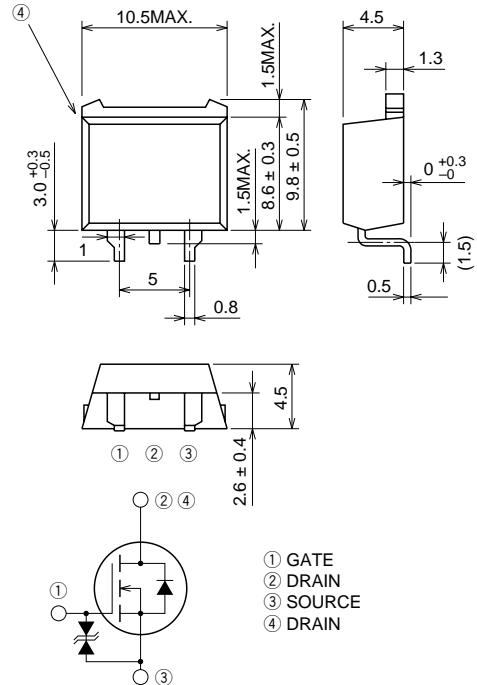
FK14VS-9



- V_{DS} 450V
- $r_{DS(ON)} (MAX)$ 0.65Ω
- I_D 14A
- Integrated Fast Recovery Diode (MAX.) 150ns

OUTLINE DRAWING

Dimensions in mm



TO-220S

APPLICATION

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

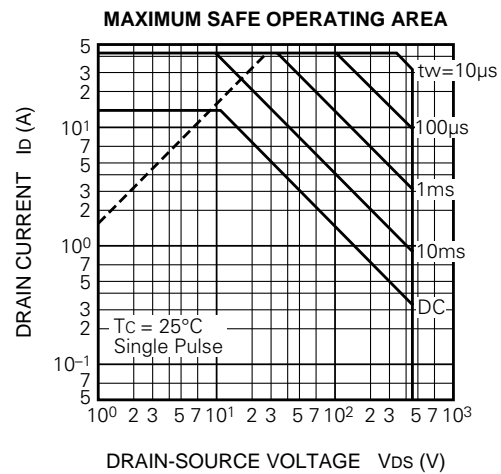
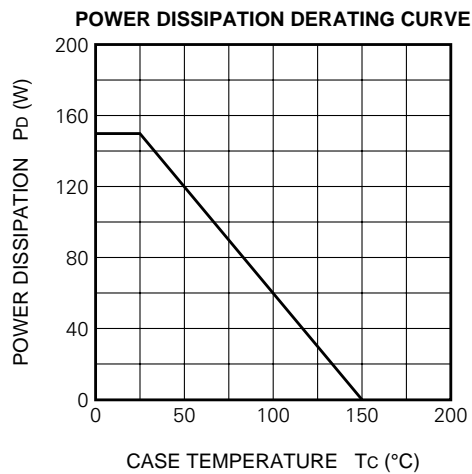
MAXIMUM RATINGS (Tc = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
V_{DS}	Drain-source voltage	$V_{GS} = 0V$	450	V
V_{GSS}	Gate-source voltage	$V_{DS} = 0V$	± 30	V
I_D	Drain current		14	A
I_{DM}	Drain current (Pulsed)		42	A
I_S	Source current		14	A
I_{SM}	Source current (Pulsed)		42	A
P_D	Maximum power dissipation		150	W
T_{ch}	Channel temperature		$-55 \sim +150$	°C
T_{stg}	Storage temperature		$-55 \sim +150$	°C
—	Weight	Typical value	1.2	g

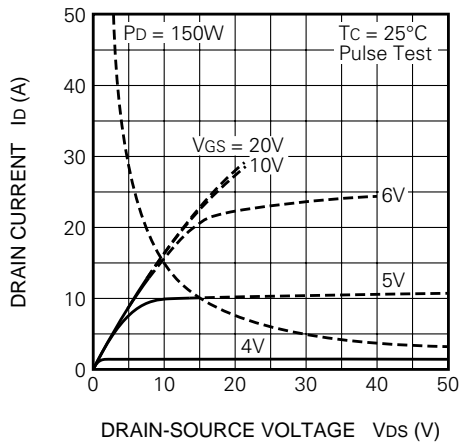
ELECTRICAL CHARACTERISTICS ($T_{ch} = 25^{\circ}\text{C}$)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
$V_{(BR)DSS}$	Drain-source breakdown voltage	$I_D = 1\text{mA}$, $V_{GS} = 0\text{V}$	450	—	—	V
$V_{(BR)GSS}$	Gate-source breakdown voltage	$I_G = \pm 100\mu\text{A}$, $V_{DS} = 0\text{V}$	± 30	—	—	V
I_{GSS}	Gate-source leakage current	$V_{GS} = \pm 25\text{V}$, $V_{DS} = 0\text{V}$	—	—	± 10	μA
I_{DSS}	Drain-source leakage current	$V_{DS} = 450\text{V}$, $V_{GS} = 0\text{V}$	—	—	1	mA
$V_{GS(th)}$	Gate-source threshold voltage	$I_D = 1\text{mA}$, $V_{DS} = 10\text{V}$	2	3	4	V
$r_{DS(ON)}$	Drain-source on-state resistance	$I_D = 7\text{A}$, $V_{GS} = 10\text{V}$	—	0.50	0.65	Ω
$V_{DS(ON)}$	Drain-source on-state voltage	$I_D = 7\text{A}$, $V_{GS} = 10\text{V}$	—	3.50	4.55	V
$ y_{fs} $	Forward transfer admittance	$I_D = 7\text{A}$, $V_{DS} = 10\text{V}$	4.5	7.0	—	S
C_{iss}	Input capacitance	$V_{DS} = 25\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$	—	1500	—	pF
C_{oss}	Output capacitance		—	180	—	pF
C_{rss}	Reverse transfer capacitance		—	30	—	pF
$t_{d(on)}$	Turn-on delay time	$V_{DD} = 200\text{V}$, $I_D = 7\text{A}$, $V_{GS} = 10\text{V}$, $R_{GEN} = R_{GS} = 50\Omega$	—	30	—	ns
t_r	Rise time		—	50	—	ns
$t_{d(off)}$	Turn-off delay time		—	130	—	ns
t_f	Fall time		—	50	—	ns
V_{SD}	Source-drain voltage	$I_S = 7\text{A}$, $V_{GS} = 0\text{V}$	—	1.5	2.0	V
$R_{th(ch-c)}$	Thermal resistance	Channel to case	—	—	0.83	$^{\circ}\text{C/W}$
t_{rr}	Reverse recovery time	$I_S = 14\text{A}$, $di/dt = -100\text{A}/\mu\text{s}$	—	—	150	ns

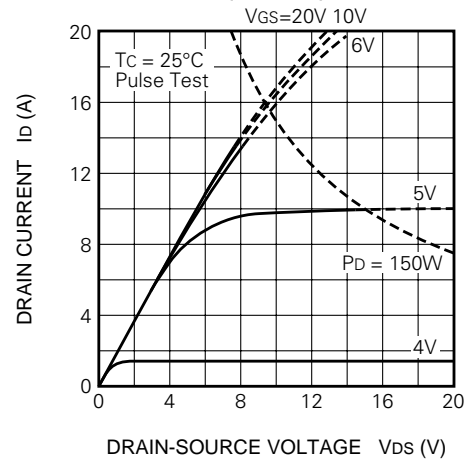
PERFORMANCE CURVES



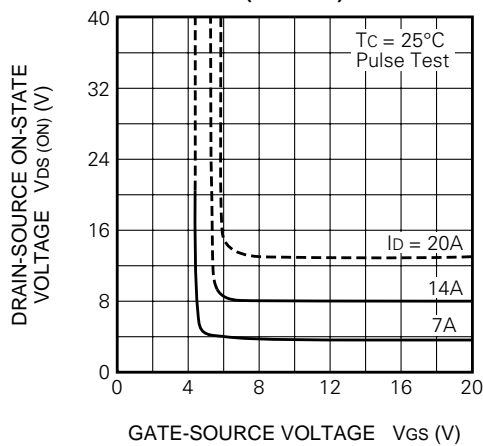
OUTPUT CHARACTERISTICS
(TYPICAL)



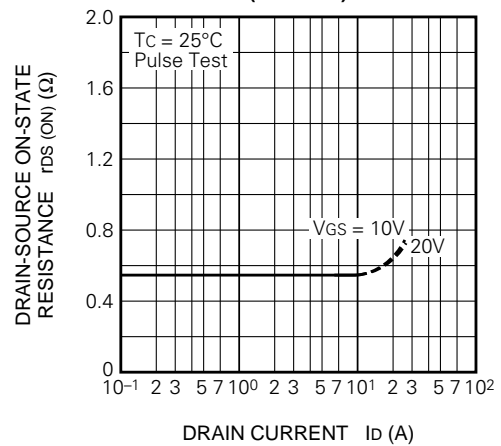
OUTPUT CHARACTERISTICS
(TYPICAL)



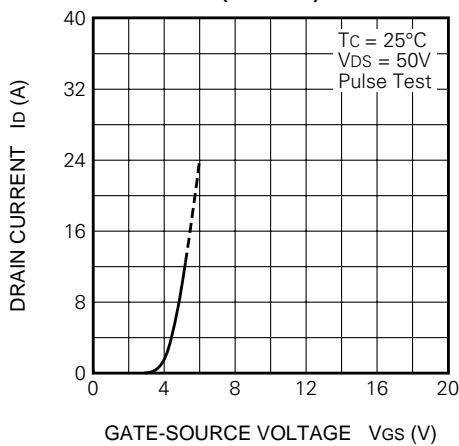
ON-STATE VOLTAGE VS.
GATE-SOURCE VOLTAGE
(TYPICAL)



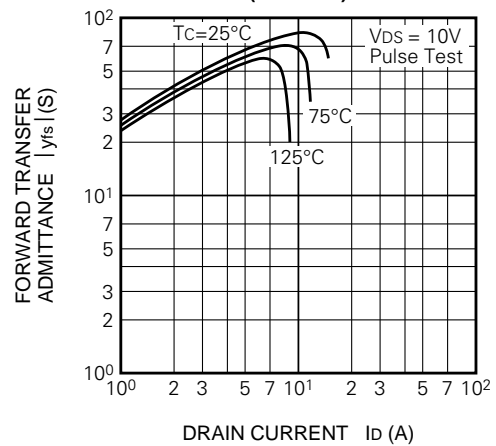
ON-STATE RESISTANCE VS.
DRAIN CURRENT
(TYPICAL)



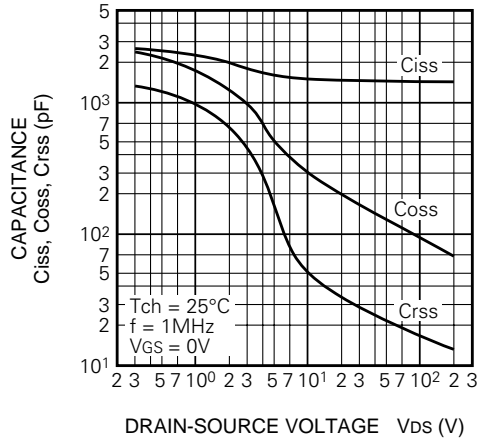
TRANSFER CHARACTERISTICS
(TYPICAL)



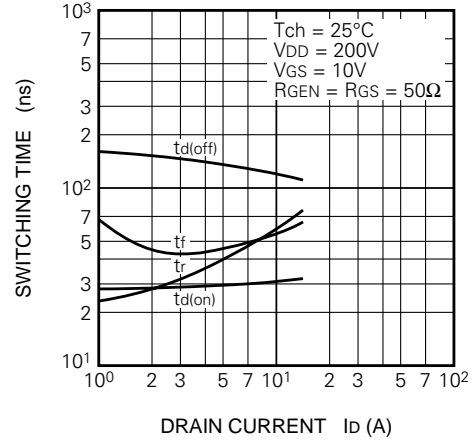
FORWARD TRANSFER ADMITTANCE
VS. DRAIN CURRENT
(TYPICAL)



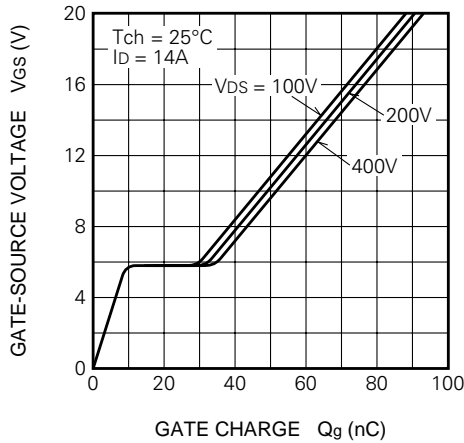
CAPACITANCE VS.
DRAIN-SOURCE VOLTAGE
(TYPICAL)



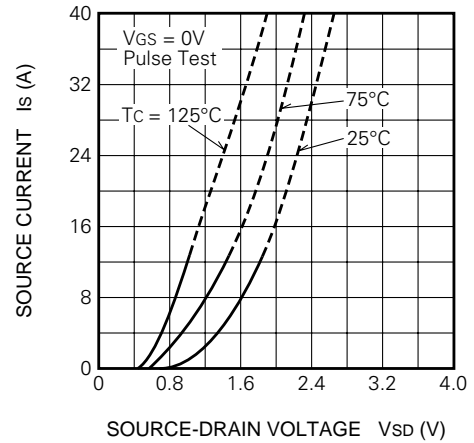
SWITCHING CHARACTERISTICS
(TYPICAL)



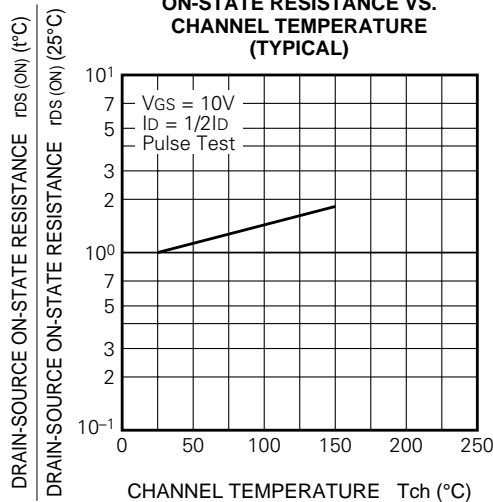
GATE-SOURCE VOLTAGE
VS. GATE CHARGE
(TYPICAL)



SOURCE-DRAIN DIODE
FORWARD CHARACTERISTICS
(TYPICAL)



ON-STATE RESISTANCE VS.
CHANNEL TEMPERATURE
(TYPICAL)



THRESHOLD VOLTAGE VS.
CHANNEL TEMPERATURE
(TYPICAL)

