

FS50VS-06

HIGH-SPEED SWITCHING USE

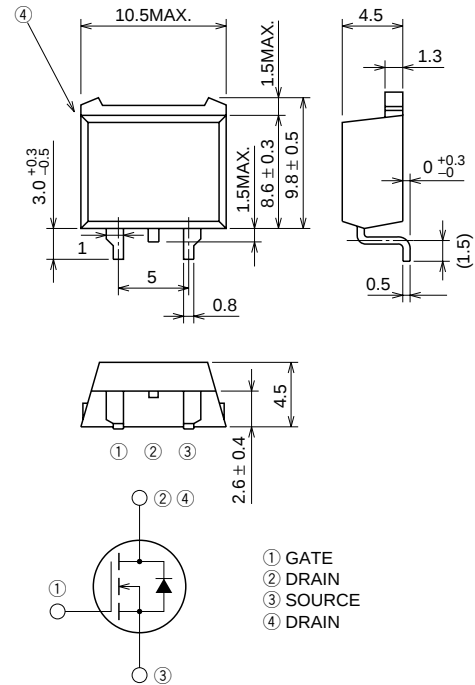
FS50VS-06



- 10V DRIVE
- V_{DS} 60V
- $r_{DS(ON)}$ (MAX) 22m Ω
- I_D 50A
- Integrated Fast Recovery Diode (TYP.) 65ns

OUTLINE DRAWING

Dimensions in mm



TO-220S

APPLICATION

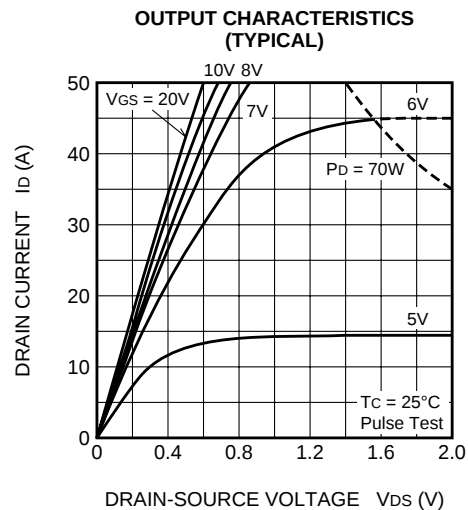
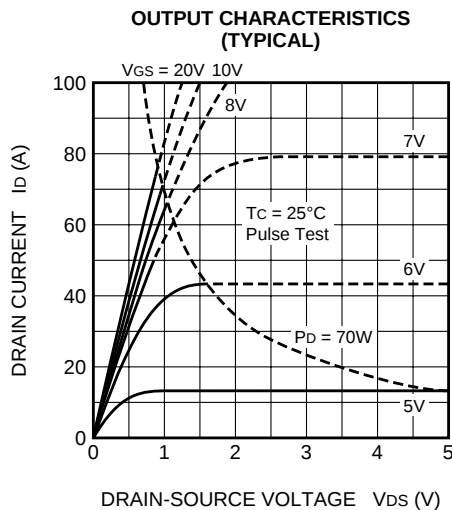
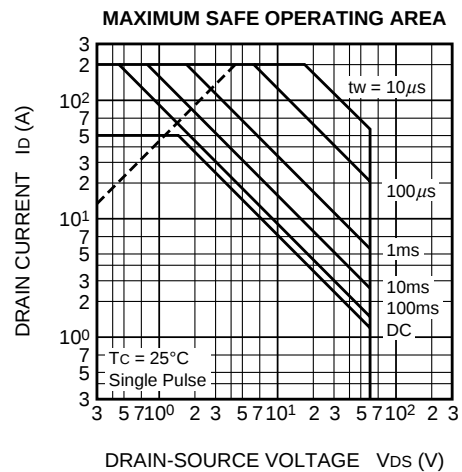
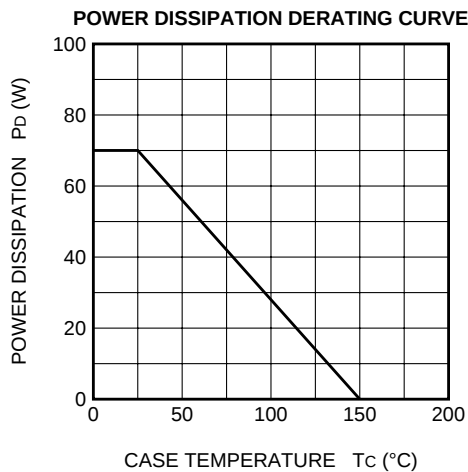
Motor control, Lamp control, Solenoid control
DC-DC converter, etc.

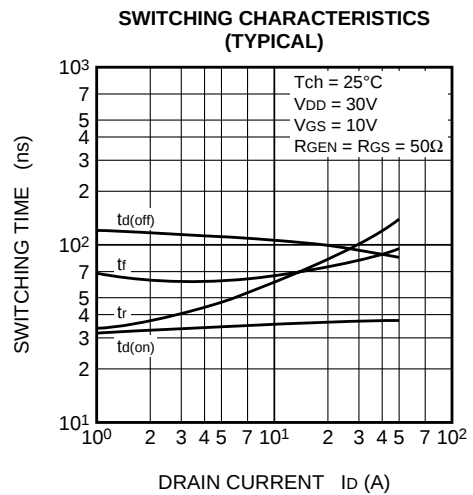
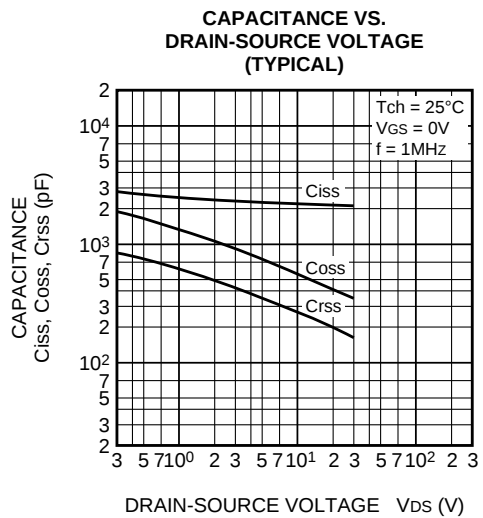
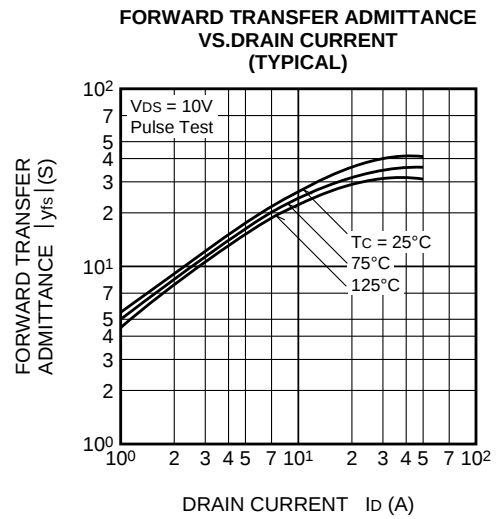
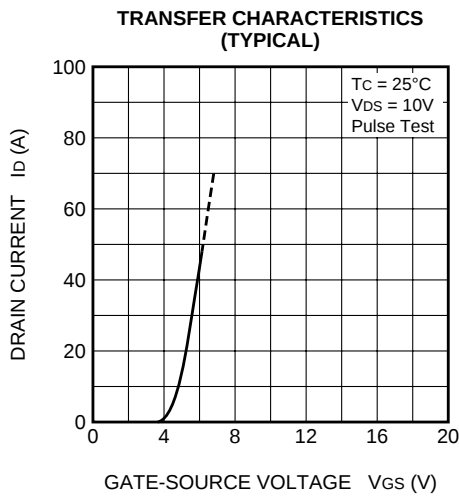
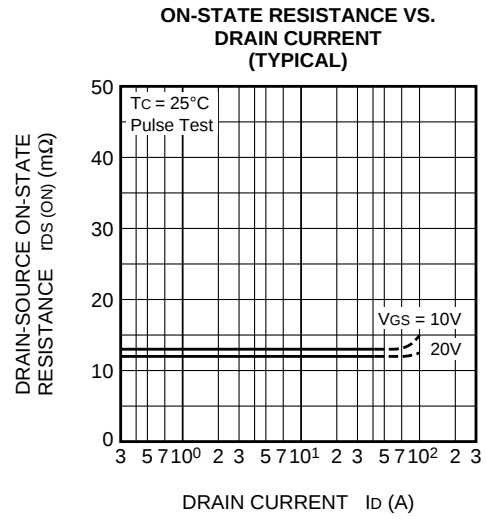
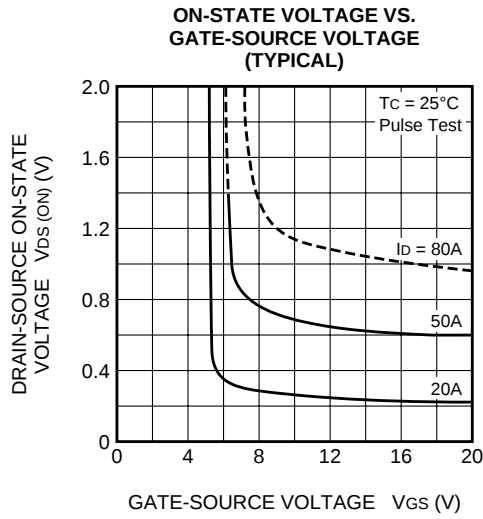
MAXIMUM RATINGS (T_c = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
V_{DS}	Drain-source voltage	$V_{GS} = 0V$	60	V
V_{GS}	Gate-source voltage	$V_{DS} = 0V$	±20	V
I_D	Drain current		50	A
I_{DM}	Drain current (Pulsed)		200	A
I_{DA}	Avalanche drain current (Pulsed)	$L = 100\mu H$	50	A
I_S	Source current		50	A
I_{SM}	Source current (Pulsed)		200	A
P_D	Maximum power dissipation		70	W
T_{ch}	Channel temperature		-55 ~ +150	°C
T_{stg}	Storage temperature		-55 ~ +150	°C
—	Weight	Typical value	1.2	g

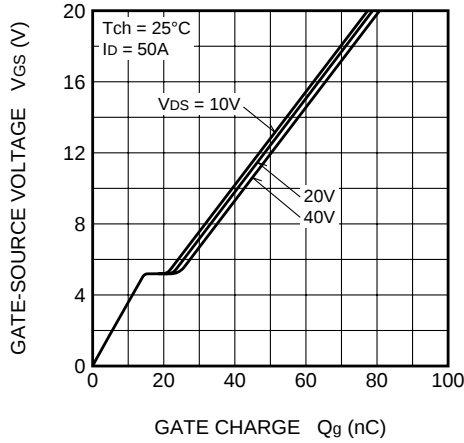
ELECTRICAL CHARACTERISTICS ($T_{ch} = 25^{\circ}\text{C}$)

Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
$V_{(BR)DSS}$	Drain-source breakdown voltage	$I_D = 1\text{mA}$, $V_{GS} = 0\text{V}$	60	—	—	V
I_{GSS}	Gate-source leakage current	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$	—	—	± 0.1	μA
I_{DSS}	Drain-source leakage current	$V_{DS} = 60\text{V}$, $V_{GS} = 0\text{V}$	—	—	0.1	mA
$V_{GS(th)}$	Gate-source threshold voltage	$I_D = 1\text{mA}$, $V_{DS} = 10\text{V}$	2.0	3.0	4.0	V
$r_{DS(on)}$	Drain-source on-state resistance	$I_D = 25\text{A}$, $V_{GS} = 10\text{V}$	—	17	22	$\text{m}\Omega$
$V_{DS(on)}$	Drain-source on-state voltage	$I_D = 25\text{A}$, $V_{GS} = 10\text{V}$	—	0.43	0.55	V
$ y_{fs} $	Forward transfer admittance	$I_D = 25\text{A}$, $V_{DS} = 10\text{V}$	—	32	—	S
C_{iss}	Input capacitance	$V_{DS} = 10\text{V}$, $V_{GS} = 0\text{V}$, $f = 1\text{MHz}$	—	2300	—	pF
C_{oss}	Output capacitance		—	570	—	pF
C_{rss}	Reverse transfer capacitance		—	280	—	pF
$t_d(on)$	Turn-on delay time	$V_{DD} = 30\text{V}$, $I_D = 25\text{A}$, $V_{GS} = 10\text{V}$, $R_{GEN} = R_{GS} = 50\Omega$	—	35	—	ns
t_r	Rise time		—	95	—	ns
$t_d(off)$	Turn-off delay time		—	95	—	ns
t_f	Fall time		—	80	—	ns
V_{SD}	Source-drain voltage	$I_S = 25\text{A}$, $V_{GS} = 0\text{V}$	—	1.0	1.5	V
$R_{th(ch-c)}$	Thermal resistance	Channel to case	—	—	1.78	$^{\circ}\text{C/W}$
t_{rr}	Reverse recovery time	$I_S = 50\text{A}$, $di/dt = -100\text{A}/\mu\text{s}$	—	65	—	ns

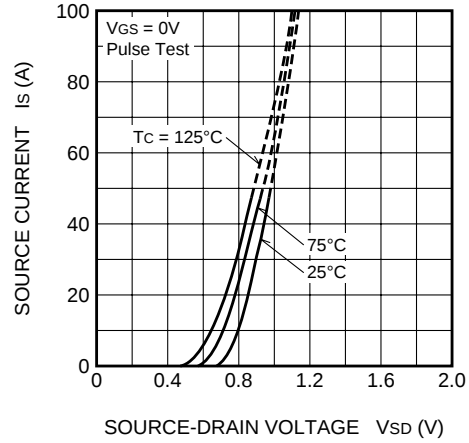
PERFORMANCE CURVES



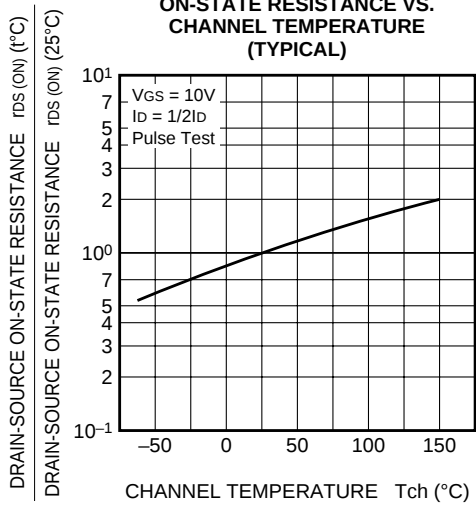
GATE-SOURCE VOLTAGE
VS.GATE CHARGE
(TYPICAL)



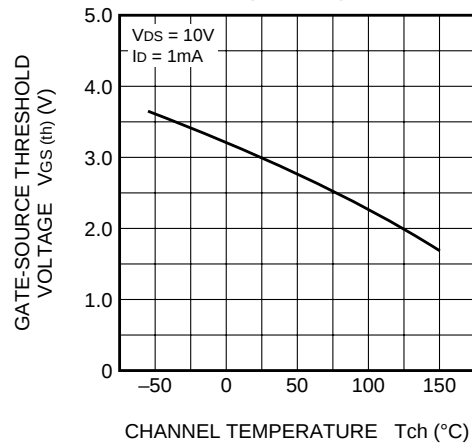
SOURCE-DRAIN DIODE
FORWARD CHARACTERISTICS
(TYPICAL)



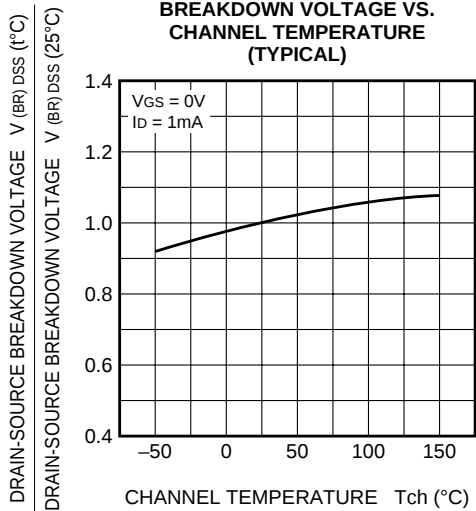
ON-STATE RESISTANCE VS.
CHANNEL TEMPERATURE
(TYPICAL)



THRESHOLD VOLTAGE VS.
CHANNEL TEMPERATURE
(TYPICAL)



BREAKDOWN VOLTAGE VS.
CHANNEL TEMPERATURE
(TYPICAL)



TRANSIENT THERMAL IMPEDANCE
CHARACTERISTICS

