

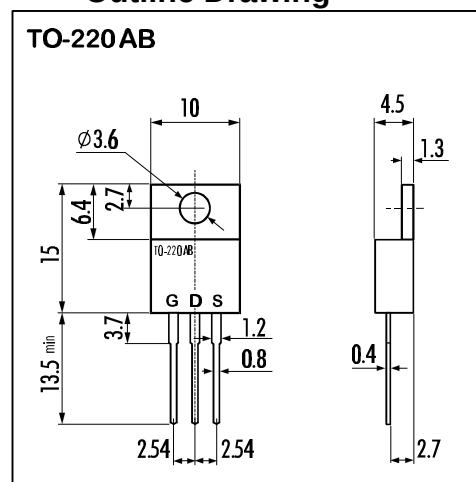
> Features

- High Current
- Low On-Resistance
- No Secondary Breakdown
- Low Driving Power
- Avalanche Rated

> Applications

- Motor Control
- General Purpose Power Amplifier
- DC-DC converters

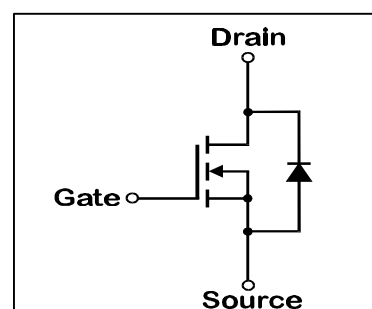
> Outline Drawing



> Maximum Ratings and Characteristics

- Absolute Maximum Ratings ($T_C=25^\circ\text{C}$), unless otherwise specified

Item	Symbol	Rating	Unit
Drain-Source-Voltage	V_{DS}	700	V
Continuous Drain Current	I_D	±5	A
Pulsed Drain Current	$I_{D(puls)}$	±20	A
Gate-Source-Voltage	V_{GS}	±30	V
Maximum Avalanche Energy	E_{AV}	222.8	mJ*
Max. Power Dissipation	P_D	60	W
Operating and Storage Temperature Range	T_{ch}	150	°C
	T_{stg}	-55 ~ +150	°C



- Electrical Characteristics ($T_C=25^\circ\text{C}$), unless otherwise specified

Item	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown-Voltage	BV_{DSS}	$I_D=1\text{mA}$ $V_{GS}=0\text{V}$	700			V
Gate Threshold Voltage	$V_{GS(th)}$	$I_D=1\text{mA}$ $V_{DS}=V_{GS}$	2,5	3,0	3,5	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=700\text{V}$ $T_{ch}=25^\circ\text{C}$		10	500	μA
		$V_{GS}=0\text{V}$ $T_{ch}=125^\circ\text{C}$		0,2	1,0	mA
Gate Source Leakage Current	I_{GSS}	$V_{GS}=\pm 30\text{V}$ $V_{DS}=0\text{V}$		10	100	nA
Drain Source On-State Resistance	$R_{DS(on)}$	$I_D=2,5\text{A}$ $V_{GS}=10\text{V}$		1,4	1,85	Ω
Forward Transconductance	g_{fs}	$I_D=2,5\text{A}$ $V_{DS}=25\text{V}$	2	4		S
Input Capacitance	C_{iss}	$V_{DS}=25\text{V}$		820	1230	pF
Output Capacitance	C_{oss}	$V_{GS}=0\text{V}$		120	180	pF
Reverse Transfer Capacitance	C_{rss}	$f=1\text{MHz}$		65	100	pF
Turn-On-Time t_{on} ($t_{on}=t_{d(on)}+t_r$)	$t_{d(on)}$	$V_{CC}=600\text{V}$		20	30	ns
	t_r	$V_{GS}=10\text{V}$		45	70	ns
Turn-Off-Time t_{off} ($t_{off}=t_{d(off)}+t_f$)	$t_{d(off)}$	$I_D=5\text{A}$		80	120	ns
	t_f	$R_{GS}=10\Omega$		45	70	ns
Avalanche Capability	I_{AV}	$L=100\mu\text{H}$ $T_{ch}=25^\circ\text{C}$	5			A
Diode Forward On-Voltage	V_{SD}	$I_F=2 \times I_{DR}$ $V_{GS}=0\text{V}$ $T_{ch}=25^\circ\text{C}$		0,93	1,4	V
Reverse Recovery Time	t_{rr}	$I_F=I_{DR}$ $V_{GS}=0\text{V}$		610		ns
Reverse Recovery Charge	Q_{rr}	$-di/dt=100\text{A}/\mu\text{s}$ $T_{ch}=25^\circ\text{C}$		5,5		μC

- Thermal Characteristics

Item	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance	$R_{th(ch-c)}$			2,08	°C/W
	$R_{th(ch-a)}$			75,0	°C/W

N-channel MOS-FET			
700V	1,85Ω	±5A	60W

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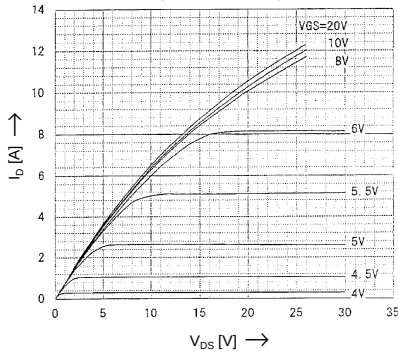
FAP-IIIB Series

FUJI
ELECTRIC

> Characteristics

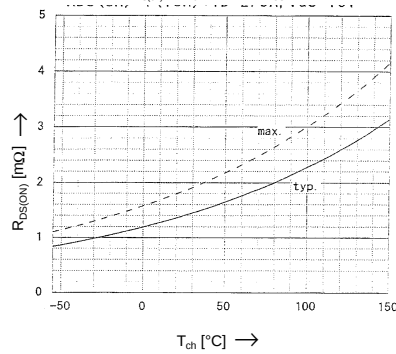
Typical Output Characteristics

$I_D = f(V_{DS})$; 80μs pulse test; $T_{ch} = 25^\circ\text{C}$



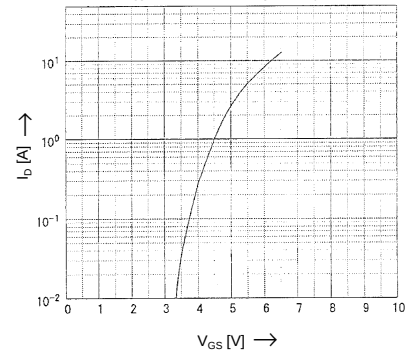
Drain-Source On-State Resistance vs. T_{ch}

$R_{DS(on)} = f(T_{ch})$; $I_D = 2.5A$; $V_{GS} = 10V$



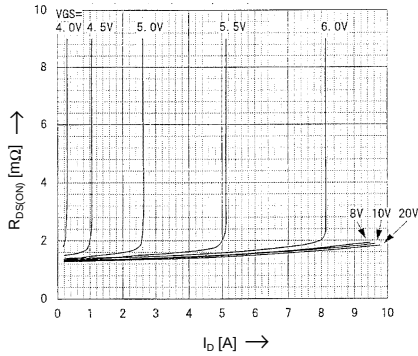
Typical Transfer Characteristics

$I_D = f(V_{GS})$; 80μs pulse test; $V_{DS} = 25V$; $T_{ch} = 25^\circ\text{C}$



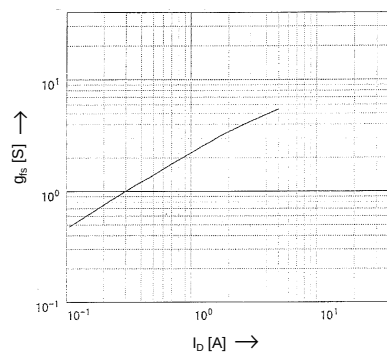
Typical Drain-Source On-State-Resistance vs. I_D

$R_{DS(on)} = f(I_D)$; 80μs pulse test; $T_{ch} = 25^\circ\text{C}$



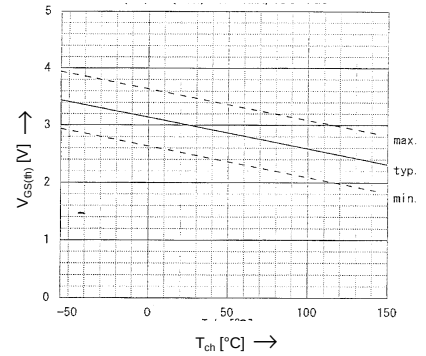
Typical Forward Transconductance vs. I_D

$g_{fs} = f(I_D)$; 80μs pulse test; $V_{DS} = 25V$; $T_{ch} = 25^\circ\text{C}$



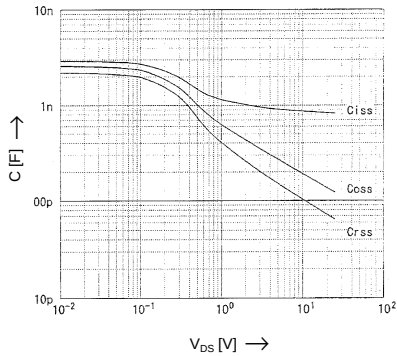
Gate Threshold Voltage vs. T_{ch}

$V_{GS(th)} = f(T_{ch})$; $I_D = 1mA$; $V_{DS} = V_{GS}$



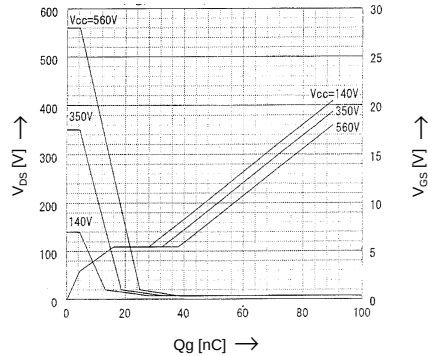
Typical Capacitances vs. V_{DS}

$C = f(V_{DS})$; $V_{GS} = 0V$; $f = 1MHz$



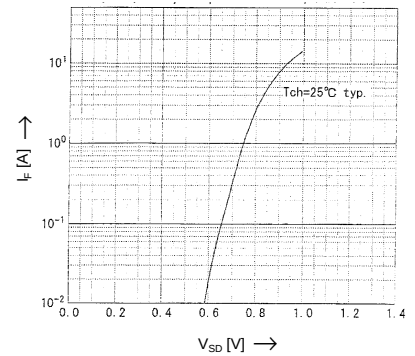
Typical Gate Charge Characteristic

$V_{GS} = f(Q_g)$; $I_D = 5A$; $T_{ch} = 25^\circ\text{C}$



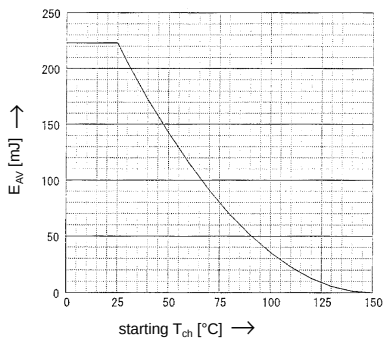
Forward Characteristics of Reverse Diode

$I_F = f(V_{SD})$; 80μs pulse test; $V_{GS} = 0V$



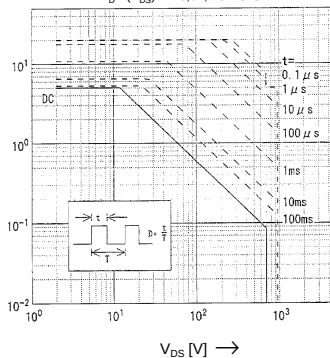
Maximum Avalanche Energy vs. starting T_{ch}

$E_{AV} = f(\text{starting } T_{ch})$; $V_{CC} = 24V$; $I_{AV} \leq 45A$



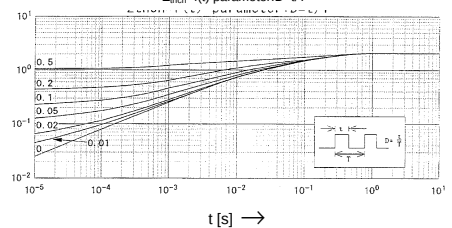
Safe Operation Area

$I_D = f(V_{DS})$; $D = 0.01$; $T_{ch} = 25^\circ\text{C}$



Transient Thermal Impedance

$Z_{thch} = f(t)$ parameter: $D = t/T$



N-channel MOS-FET			
700V	1,85Ω	±5A	60W

> Characteristics

