

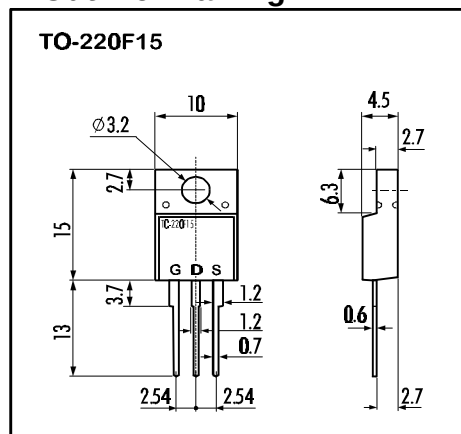
> Features

- High Speed Switching
- Low On-Resistance
- No Secondary Breakdown
- Low Driving Power
- High Voltage
- $V_{GS} = \pm 30V$ Guarantee
- Repetitive Avalanche Rated

> Applications

- Switching Regulators
- UPS
- DC-DC converters
- General Purpose Power Amplifier

> Outline Drawing

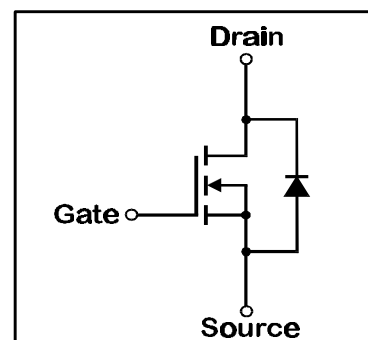


> Maximum Ratings and Characteristics

- Absolute Maximum Ratings ($T_c = 25^\circ C$), unless otherwise specified

Item	Symbol	Rating	Unit
Drain-Source-Voltage	V_{DS}	600	V
Continuous Drain Current	I_D	9	A
Pulsed Drain Current	$I_{D(puls)}$	32	A
Gate-Source-Voltage	V_{GS}	± 30	V
Repetitive or Non-Repetitive ($T_{ch} \leq 150^\circ C$)	I_{AR}	9	A
Avalanche Energy	E_{AS}	71.9	mJ
Max. Power Dissipation	P_D	50	W
Operating and Storage Temperature Range	T_{ch}	150	$^\circ C$
	T_{stg}	-55 ~ +150	$^\circ C$

> Equivalent Circuit



- Electrical Characteristics ($T_c = 25^\circ C$), unless otherwise specified

Item	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown-Voltage	$V_{(BR)DSS}$	$I_D = 1mA$ $V_{GS} = 0V$	600			V
Gate Threshold Voltage	$V_{GS(th)}$	$I_D = 1mA$ $V_{DS} = V_{GS}$	3.5	4.0	4.5	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 600V$ $T_{ch} = 25^\circ C$		10	500	μA
		$V_{GS} = 0V$ $T_{ch} = 125^\circ C$		0.2	1.0	mA
Gate Source Leakage Current	I_{GSS}	$V_{GS} = \pm 30V$ $V_{DS} = 0V$		10	100	nA
Drain Source On-State Resistance	$R_{DS(on)}$	$I_D = 4A$ $V_{GS} = 10V$		1.0	1.2	Ω
Forward Transconductance	g_{fs}	$I_D = 4A$ $V_{DS} = 25V$	2.5	5		S
Input Capacitance	C_{iss}	$V_{DS} = 25V$		900	1400	pF
Output Capacitance	C_{oss}	$V_{GS} = 0V$		150	230	pF
Reverse Transfer Capacitance	C_{rss}	$f = 1MHz$		70	110	pF
Turn-On-Time t_{on} ($t_{on} = t_{d(on)} + t_r$)	$t_{d(on)}$	$V_{CC} = 300V$		25	40	ns
	t_r	$I_D = 9A$		70	110	ns
Turn-Off-Time t_{off} ($t_{off} = t_{d(off)} + t_f$)	$t_{d(off)}$	$V_{GS} = 10V$		60	90	ns
	t_f	$R_{GS} = 10 \Omega$		35	60	ns
Avalanche Capability	I_{AV}	$L = 100\mu H$ $T_{ch} = 25^\circ C$	9			A
Diode Forward On-Voltage	V_{SD}	$I_F = 2I_{DR}$ $V_{GS} = 0V$ $T_{ch} = 25^\circ C$		1.0	1.5	V
Reverse Recovery Time	t_{rr}	$I_F = I_{DR}$ $V_{GS} = 0V$		550		ns
Reverse Recovery Charge	Q_{rr}	$-dI_F/dt = 100A/\mu s$ $T_{ch} = 25^\circ C$		7.0		μC

- Thermal Characteristics

Item	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Thermal Resistance	$R_{th(ch-a)}$	channel to air			62.5	$^\circ C/W$
	$R_{th(ch-c)}$	channel to case			2.5	$^\circ C/W$

N-channel MOS-FET			
600V	1,2Ω	9A	50W

2SK2645-01MR

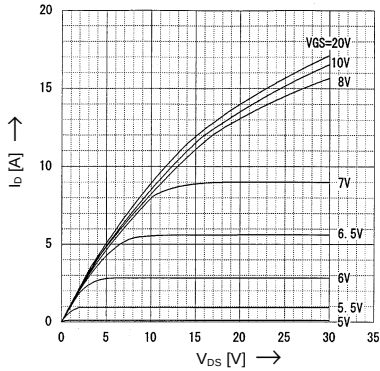
FAP-IIS Series

FUJI
ELECTRIC

> Characteristics

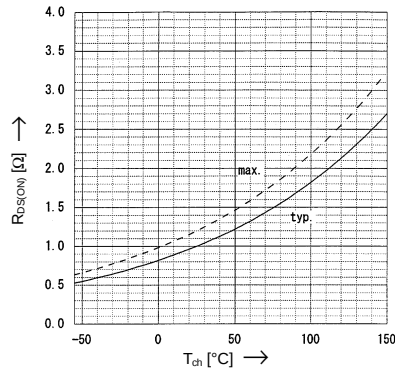
Typical Output Characteristics

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



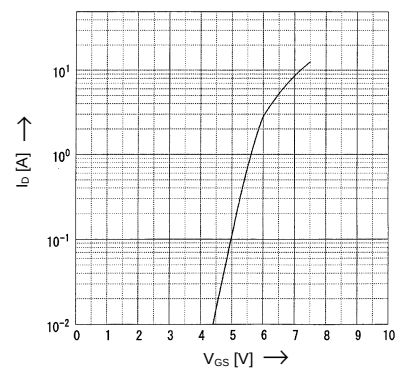
Drain-Source On-State Resistance vs. T_{ch}

$R_{DS(on)} = f(T_{ch})$; $I_D = 4A$; $V_{GS} = 10V$



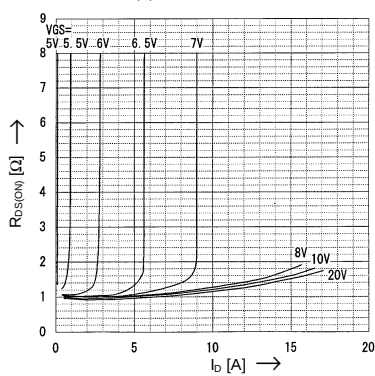
Typical Transfer Characteristics

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



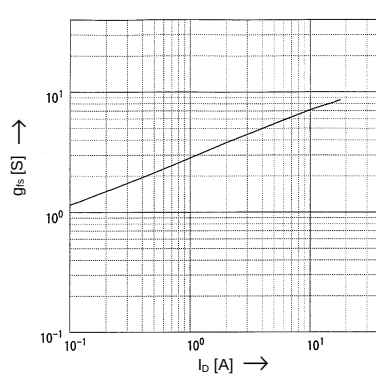
Typical Drain-Source On-State-Resistance vs. I_D

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



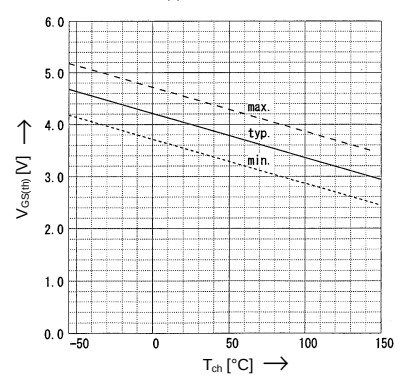
Typical Forward Transconductance vs. I_D

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



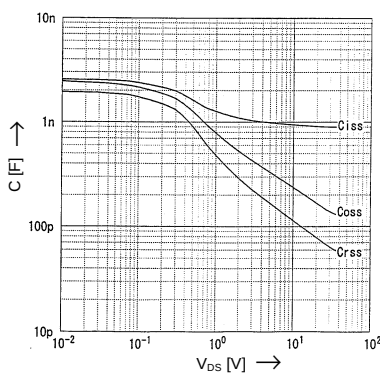
Gate Threshold Voltage vs. T_{ch}

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



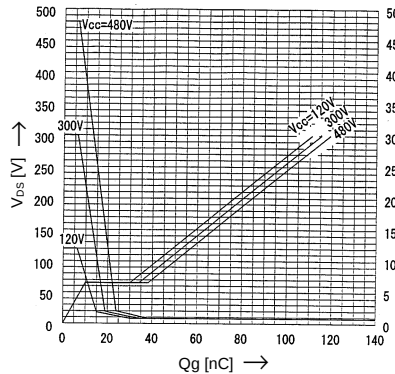
Typical Capacitances vs. V_{DS}

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



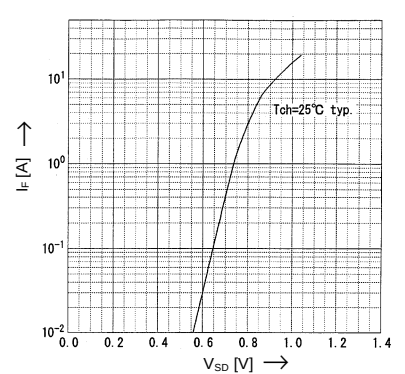
Typical Gate Charge Characteristic

$V_{GS} = f(Q_g)$; $I_D = 9A$; $T_C = 25^\circ\text{C}$



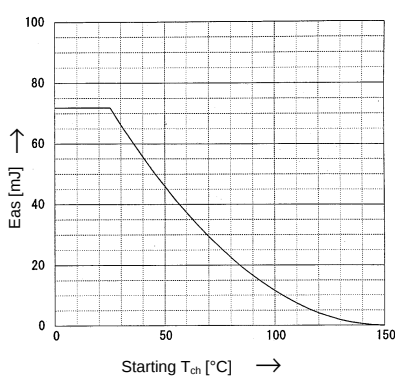
Forward Characteristics of Reverse Diode

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



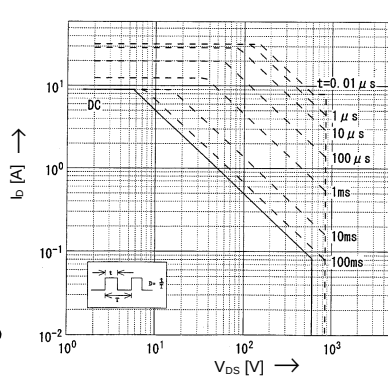
Avalanche Energy Derating

$E_{as} = f(\text{starting } T_{ch})$; $V_{CC} = 60V$; $I_{AV} = 9A$



Safe Operation Area

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



$Z_{th(ch-e)}$ [K/W]

Transient Thermal impedance

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

