

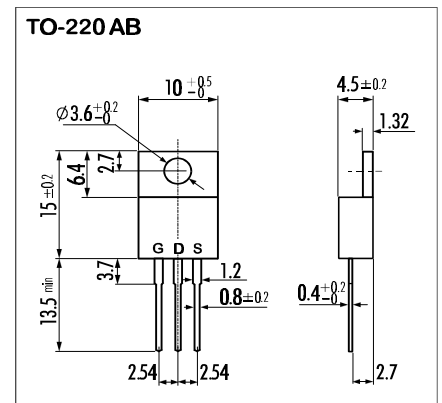
**> Features**

- 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**



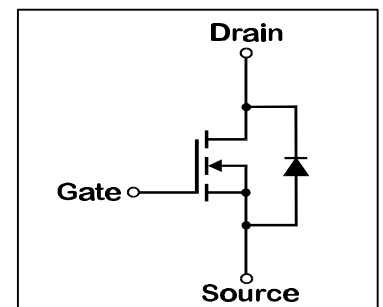
**> Maximum Ratings and Characteristics**

- Absolute Maximum Ratings (T<sub>C</sub>=25°C), unless otherwise specified

Item	Symbol	Rating	Unit
Drain-Source-Voltage	V <sub>DS</sub>	30	V
Continuous Drain Current	I <sub>D</sub>	±50	A
Pulsed Drain Current	I <sub>D(puls)</sub>	±200	A
Gate-Source-Voltage	V <sub>GS</sub>	±16	V
Maximum Avalanche Energy	E <sub>AV</sub>	520	mJ*
Max. Power Dissipation	P <sub>D</sub>	60	W
Operating and Storage Temperature Range	T <sub>ch</sub>	150	°C
	T <sub>stg</sub>	-55 ~ +150	°C

\* L=0,277mH, V<sub>CC</sub>=12V

**> Equivalent Circuit**



- Electrical Characteristics (T<sub>C</sub>=25°C), unless otherwise specified

Item	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown-Voltage	BV <sub>DSS</sub>	I <sub>D</sub> =1mA V <sub>GS</sub> =0V	30			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	I <sub>D</sub> =1mA V <sub>DS</sub> =V <sub>GS</sub>	1,0	1,5	2,0	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =30V T <sub>ch</sub> =25°C		10	500	μA
		V <sub>GS</sub> =0V T <sub>ch</sub> =125°C		0,2	1,0	mA
Gate Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±16V V <sub>DS</sub> =0V		10	100	nA
Drain Source On-State Resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =25A V <sub>GS</sub> =4V		0,012	0,017	Ω
		V <sub>GS</sub> =10V		0,0075	0,01	Ω
Forward Transconductance	g <sub>fs</sub>	I <sub>D</sub> =25A V <sub>DS</sub> =25V	22	45		S
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V V <sub>GS</sub> =0V		2750	4130	pF
Output Capacitance	C <sub>oss</sub>	f=1MHz		1300	1950	pF
Reverse Transfer Capacitance	C <sub>rss</sub>	f=1MHz		600	900	pF
Turn-On-Time t <sub>on</sub> (t <sub>on</sub> =t <sub>d(on)</sub> +t <sub>r</sub> )	t <sub>d(on)</sub>	V <sub>CC</sub> =15V I <sub>D</sub> =50A		13	20	ns
	t <sub>r</sub>	V <sub>GS</sub> =10V R <sub>GS</sub> =10 Ω		180	270	ns
Turn-Off-Time t <sub>off</sub> (t <sub>off</sub> =t <sub>d(off)</sub> +t <sub>f</sub> )	t <sub>d(off)</sub>	V <sub>GS</sub> =10V		55	83	ns
	t <sub>f</sub>	R <sub>GS</sub> =10 Ω		150	230	ns
Avalanche Capability	I <sub>AV</sub>	L = 100μH T <sub>ch</sub> =25°C	50			A
Diode Forward On-Voltage	V <sub>SD</sub>	I <sub>F</sub> =2xI <sub>DR</sub> V <sub>GS</sub> =0V T <sub>ch</sub> =25°C		1,14	1,71	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =2xI <sub>DR</sub> V <sub>GS</sub> =0V		85	130	ns
Reverse Recovery Charge	Q <sub>rr</sub>	-dI <sub>F</sub> /dt=100A/μs T <sub>ch</sub> =25°C		0,17		μC

- Thermal Characteristics

Item	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Thermal Resistance	R <sub>th(ch-a)</sub>	channel to air			75	°C/W
	R <sub>th(ch-c)</sub>	channel to case			2,08	°C/W

N-channel MOS-FET			
30V	0,01Ω	±50A	60W

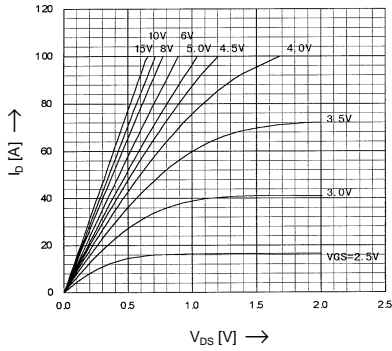
# 2SK2687-01

## FAP-IIS Series

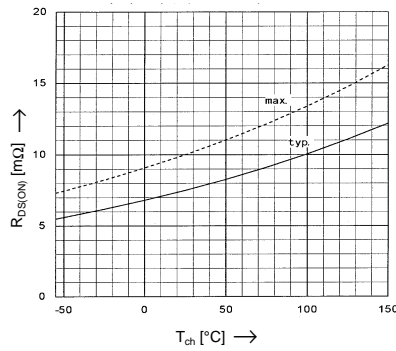


### > Characteristics

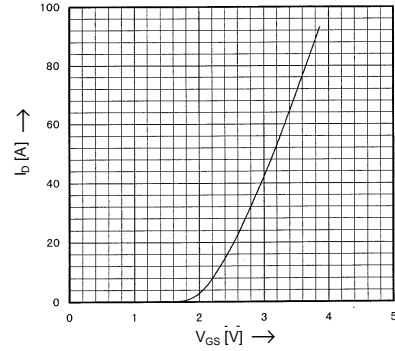
Typical Output Characteristics  
 $I_D = f(V_{DS})$ ; 80μs pulse test;  $T_C = 25^\circ\text{C}$



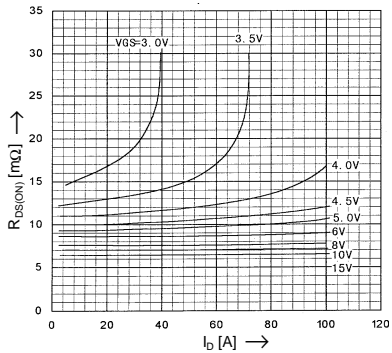
Drain-Source On-State Resistance vs.  $T_{ch}$   
 $R_{DS(on)} = f(T_{ch})$ ;  $I_D = 25\text{A}$ ;  $V_{GS} = 10\text{V}$



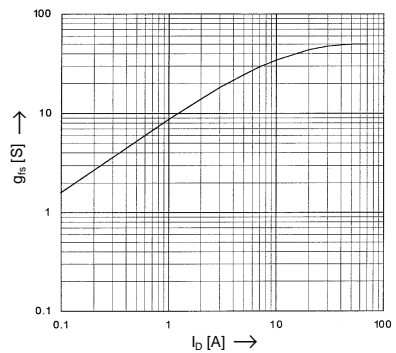
Typical Transfer Characteristics  
 $I_D = f(V_{GS})$ ; 80μs pulse test;  $V_{DS} = 25\text{V}$ ;  $T_{ch} = 25^\circ\text{C}$



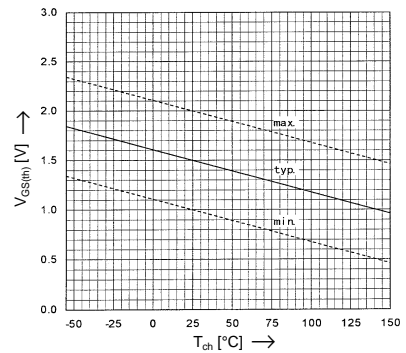
Typical Drain-Source On-State-Resistance vs.  $I_D$   
 $R_{DS(on)} = f(I_D)$ ; 80μs pulse test;  $T_C = 25^\circ\text{C}$



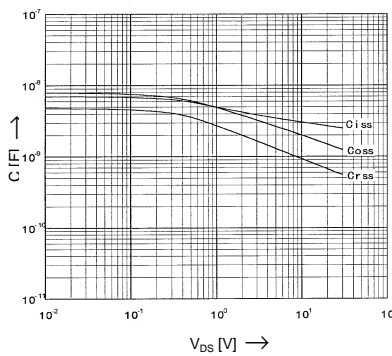
Typical Forward Transconductance vs.  $I_D$   
 $g_{fs} = f(I_D)$ ; 80μs pulse test;  $V_{DS} = 25\text{V}$ ;  $T_{ch} = 25^\circ\text{C}$



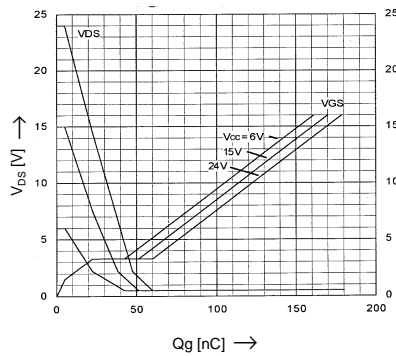
Gate Threshold Voltage vs.  $T_{ch}$   
 $V_{GS(th)} = f(T_{ch})$ ;  $I_D = 1\text{mA}$ ;  $V_{DS} = V_{GS}$



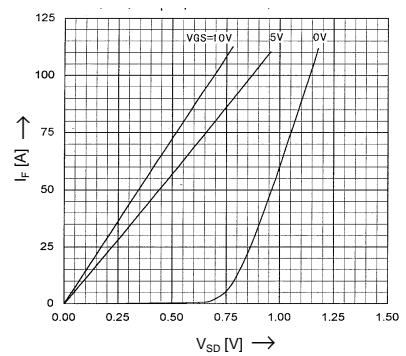
Typical Capacitances vs.  $V_{DS}$   
 $C = f(V_{DS})$ ;  $V_{GS} = 0\text{V}$ ;  $f = 1\text{MHz}$



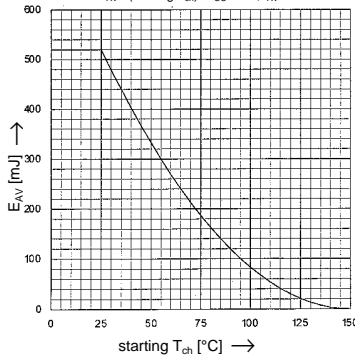
Typical Gate Charge Characteristic  
 $V_{GS} = f(Q_g)$ ;  $I_D = 50\text{A}$ ;  $T_C = 25^\circ\text{C}$



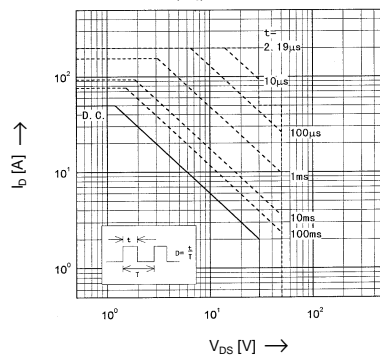
Forward Characteristics of Reverse Diode  
 $I_F = f(V_{SD})$ ; 80μs pulse test;  $T_{ch} = 25^\circ\text{C}$



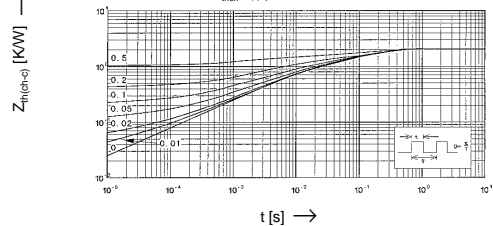
Maximum Avalanche Energy vs. starting  $T_{ch}$   
 $E_{AV} = f(\text{starting } T_{ch})$ ;  $V_{CC} = 12\text{V}$ ;  $I_{AV} \leq 50\text{A}$



Safe Operation Area  
 $I_D = f(V_{DS})$ ;  $D = 0,01$ ;  $T_C = 25^\circ\text{C}$



Transient Thermal Impedance  
 $Z_{th(ch-c)} = f(t)$  parameter:  $D = t/T$



N-channel MOS-FET			
30V	0,01Ω	±50A	60W

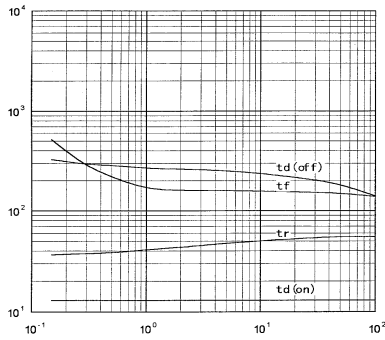
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## FAP-IIS Series

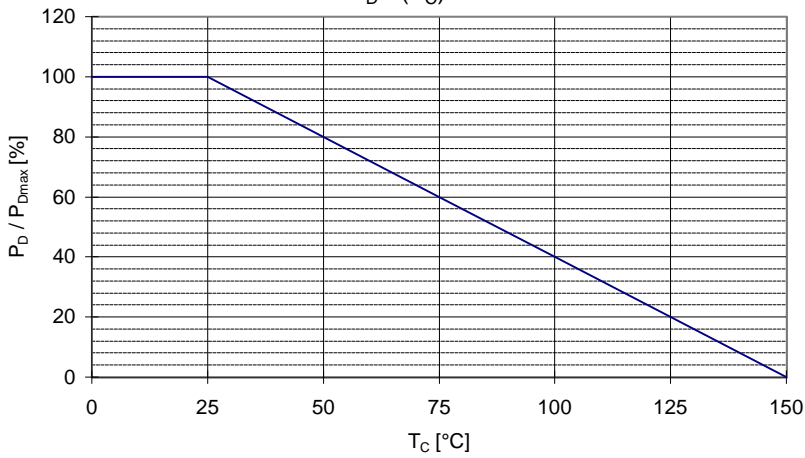


### > Characteristics

Typical Switching Characteristics vs. ID  
 $t=f(I_D): V_{CC}=15V, V_{GS}=10V, R_G=10\Omega$



Power Dissipation  
 $P_D=f(T_C)$



Maximum Avalanche Current vs. starting T<sub>ch</sub>  
 $I_{AV}=f(\text{starting } T_{ch})$

