2SK2687-01

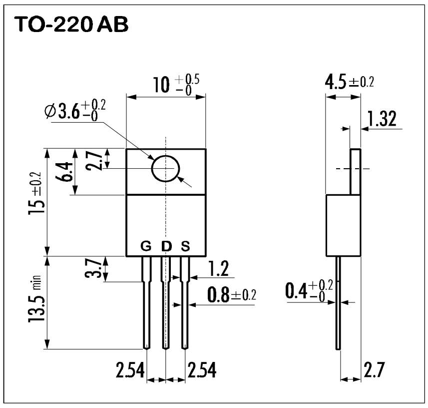
FAP-IIS Series

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

> Features

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

> Outline Drawing



> Applications

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

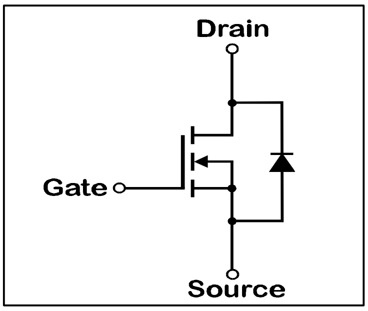
> Maximum Ratings and Characteristics

- Absolute Maximum Ratings (T_C=25°C), unless otherwise specified

Item	Symbol	Rating	Unit
Drain-Source-Voltage	V_{DS}	30	V
Continous Drain Current	I_D	±50	A
Pulsed Drain Current	$I_{D(puls)}$	±200	A
Gate-Source-Voltage	V_{GS}	±16	V
Maximum Avalanche Energy	E_{AV}	520	mJ*
Max. Power Dissipation	P_D	60	W
Operating and Storage Temperature Range	T_{ch}	150	°C
	T_{stg}	-55 ~ +150	°C

* L=0,277mH, V_{CC}=12V

> Equivalent Circuit



- Electrical Characteristics (T_C=25°C), unless otherwise specified

Item	Symbol	Test conditions		Min.	Typ.	Max.	Unit
Drain-Source Breakdown-Voltage	BV_{DSS}	I_D=1mA	V_{GS}=0V	30			V
Gate Threshhold Voltage	$V_{GS(th)}$	I_D=1mA	V_{DS}=V_{GS}	1,0	1,5	2,0	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V	T_{ch}=25°C		10	500	µA
		V_{GS}=0V	T_{ch}=125°C		0,2	1,0	mA
Gate Source Leakage Current	I_{GSS}	V_{GS}=±16V	V_{DS}=0V		10	100	nA
Drain Source On-State Resistance	$R_{DS(on)}$	I_D=25A	V_{GS}=4V		0,012	0,017	Ω
			V_{GS}=10V		0,0075	0,01	Ω
Forward Transconductance	g_{fs}	I_D=25A	V_{DS}=25V	22	45		S
Input Capacitance	C_{iss}	V_{DS}=25V			2750	4130	pF
Output Capacitance	C_{oss}	V_{GS}=0V			1300	1950	pF
Reverse Transfer Capacitance	C_{rss}	f=1MHz			600	900	pF
Turn-On-Time t_{on} (t_{on}=$t_{d(on)}$+t_r)	$t_{d(on)}$	V_{CC}=15V			13	20	ns
	t_r	I_D=50A			180	270	ns
Turn-Off-Time t_{off} (t_{on}=$t_{d(off)}$+t_f)	$t_{d(off)}$	V_{GS}=10V			55	83	ns
	t_f	R_{GS}=10 Ω			150	230	ns
Avalanche Capability	I_{AV}	L = 100µH	T_{ch}=25°C	50			A
Diode Forward On-Voltage	V_{SD}	I_F=2xI_{DR} V_{GS}=0V T_{ch}=25°C			1,14	1,71	V
Reverse Recovery Time	t_{rr}	I_F=2xI_{DR} V_{GS}=0V			85	130	ns
Reverse Recovery Charge	Q_{rr}	-dI_F/dt=100A/µs T_{ch}=25°C			0,17		µC

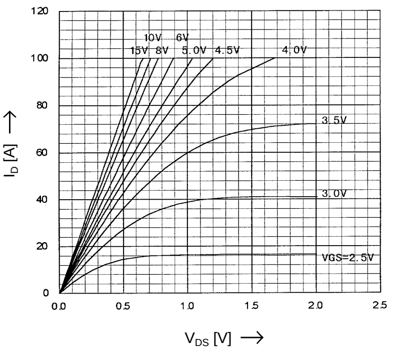
- Thermal Characteristics

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

> Characteristics

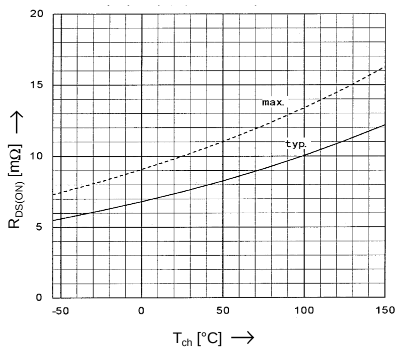
Typical Output Characteristics

I_D=f(V_{DS}); 80µs pulse test; T_C=25°C



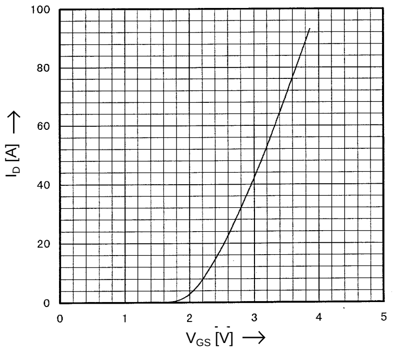
Drain-Source On-State Resistance vs. T_{ch}

$R_{DS(on)}$ = f(T_{ch}); I_D=25A; V_{GS}=10V



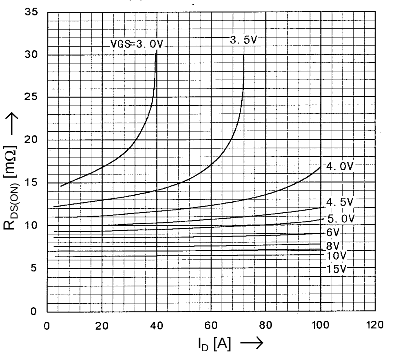
Typical Transfer Characteristics

I_D=f(V_{GS}); 80µs pulse test; V_{DS}=25V; T_{ch}=25°C



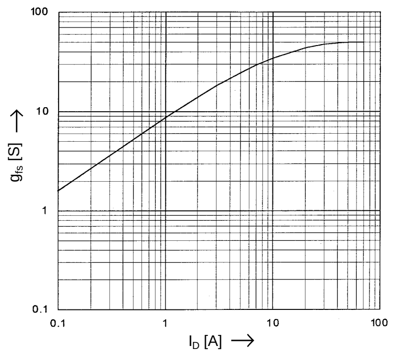
Typical Drain-Source On-State-Resistance vs. I_D

$R_{DS(on)}$=f(I_D); 80µs pulse test; T_C=25°C



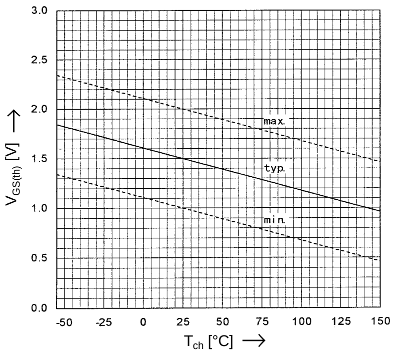
Typical Forward Transconductance vs. I_D

g_{fs}=f(I_D); 80µs pulse test; V_{DS}=25V; T_{ch}=25°C



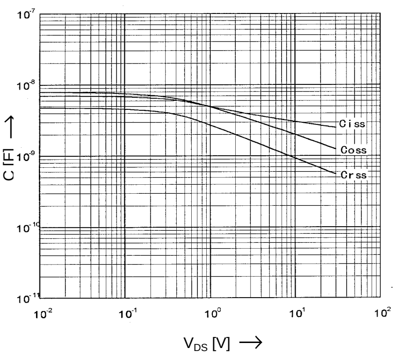
Gate Threshold Voltage vs. T_{ch}

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



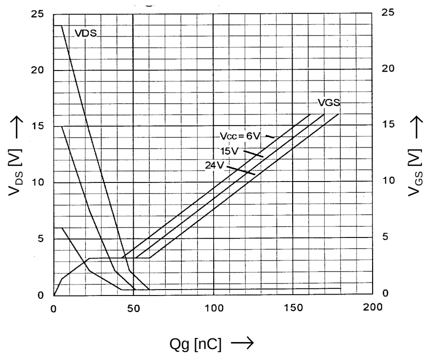
Typical Capacitances vs. V_{DS}

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



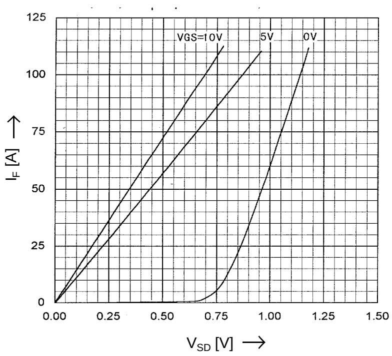
Typical Gate Charge Characteristic

V_{GS}=f(Qg); I_D=50A; T_C=25°C



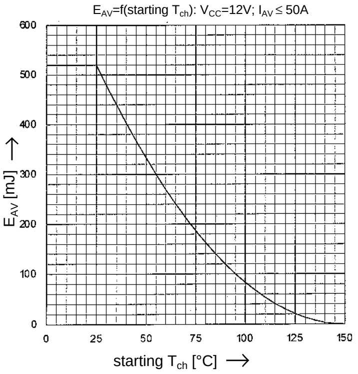
Forward Characteristics of Reverse Diode

I_F=f(V_{SD}); 80µs pulse test; T_{ch}=25°C



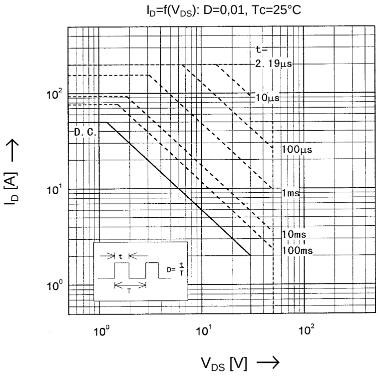
Maximum Avalanche Energy vs. starting T_{ch}

E_{AV}=f(starting T_{ch}): V_{CC}=12V; I_{AV} ≤ 50A



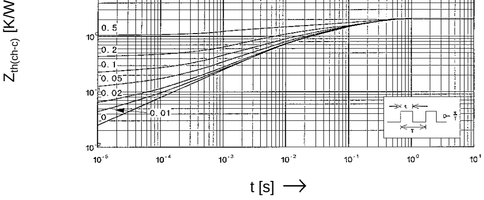
Safe Operation Area

I_D=f(V_{DS}): D=0,01, Tc=25°C



Transient Thermal impedance

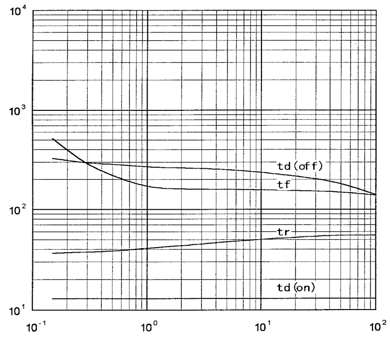
Z_{thch}=f(t) parameter:D=t/T



> Characteristics

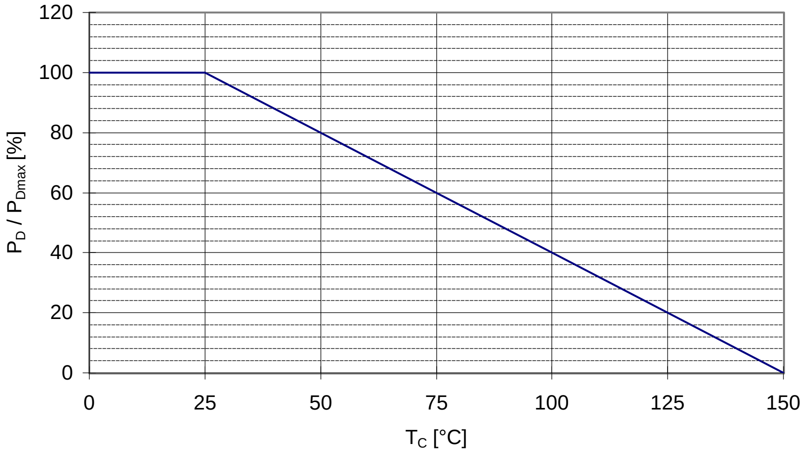
Typical Switching Characteristics vs. ID

t=f(ID):Vcc=15V,VGS=10V, RG=10Ω



Power Dissipation

$P_D=f(T_C)$



Maximum Avalanche Current vs. starting T_{ch}

$I_{AV}=f(\text{starting } T_{ch})$