

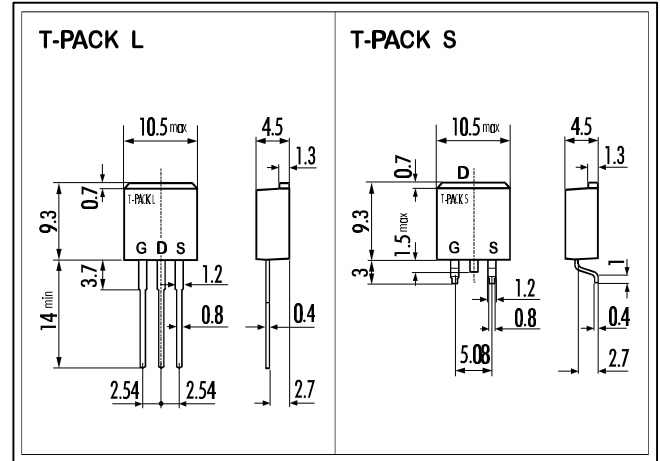
**> Features**

- 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**



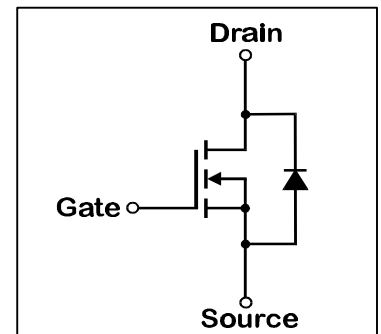
**> Maximum Ratings and Characteristics**

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

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

L=0.277mH, Vcc=12V

**> Equivalent Circuit**



- Electrical Characteristics ( $T_C=25^\circ C$ ), 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 Threshold Voltage	$V_{GS(th)}$	$I_D=1mA$ $V_{DS}=V_{GS}$	1,0	1,5	2,0	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=30V$ $T_{ch}=25^\circ C$		10	500	$\mu A$
		$V_{GS}=0V$ $T_{ch}=125^\circ C$		0,2	1,0	mA
Gate Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 16V$ $V_{DS}=0V$		10	100	nA
Drain Source On-State Resistance	$R_{DS(on)}$	$I_D=25A$ $V_{GS}=4V$		0,012	0,017	$\Omega$
		$I_D=25A$ $V_{GS}=10V$		0,0075	0,01	$\Omega$
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 $t_{off}$ ( $t_{off}=t_{d(off)}+t_f$ )	$t_{d(off)}$	$V_{GS}=10V$		55	83	ns
	$t_f$	$R_{GS}=10\Omega$		150	230	ns
Avalanche Capability	$I_{AV}$	$L = 100\mu H$ $T_{ch}=25^\circ C$	50			A
Diode Forward On-Voltage	$V_{SD}$	$I_F=2xI_{DR}$ $V_{GS}=0V$ $T_{ch}=25^\circ C$		1,14	1,71	V
Reverse Recovery Time	$t_{rr}$	$I_F=I_{DR}$ $V_{GS}=0V$		85	130	ns
Reverse Recovery Charge	$Q_{rr}$	$-di_F/dt=100A/\mu s$ $T_{ch}=25^\circ C$		0,17		$\mu C$

- Thermal Characteristics

Item	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Thermal Resistance	$R_{th(ch-c)}$	channel to case			2,08	$^\circ C/W$
	$R_{th(ch-a)}$	channel to air			125,0	$^\circ C/W$

# N-channel MOS-FET

30V | 0,017Ω | ±50A | 60W

# 2SK2688-01

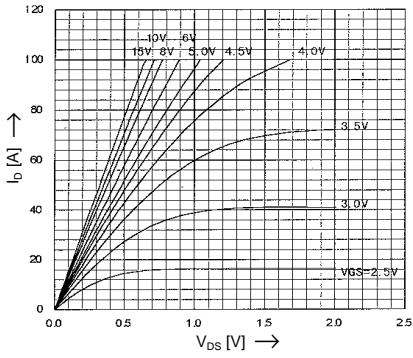
## FAP-IIS Series



### > Characteristics

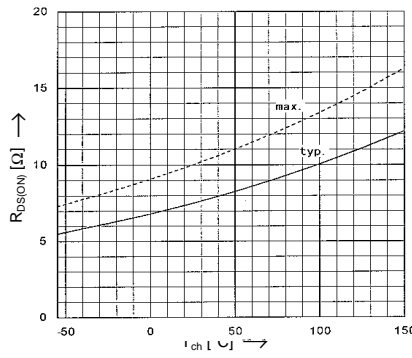
Typical Output Characteristics

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



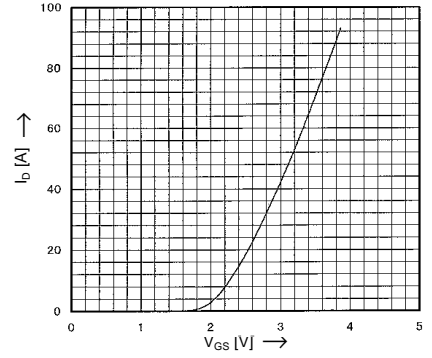
Drain-Source-On-State Resistance vs.  $T_{ch}$

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



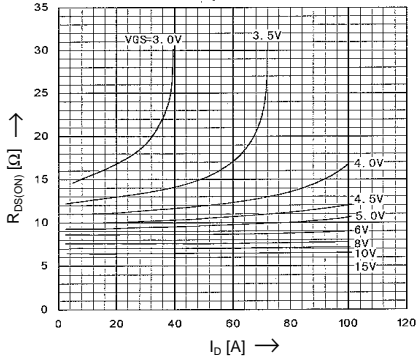
Typical Transfer Characteristics

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



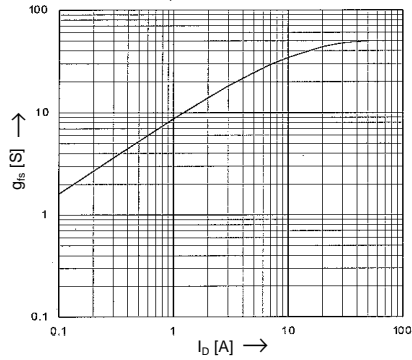
Typical Drain-Source-On-State-Resistance vs.  $I_D$

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



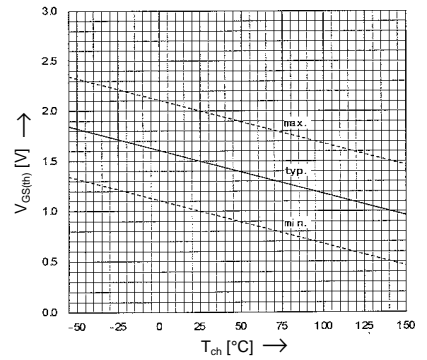
Typical Forward Transconductance vs.  $I_D$

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



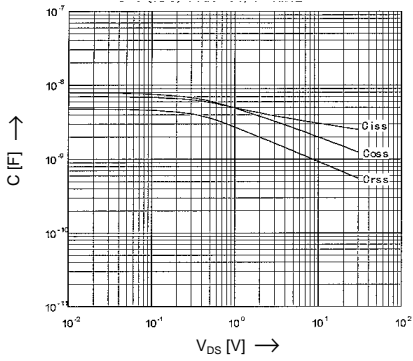
Gate Threshold Voltage vs.  $T_{ch}$

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



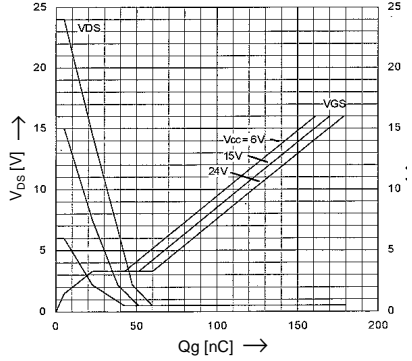
Typical Capacitances vs.  $V_{DS}$

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



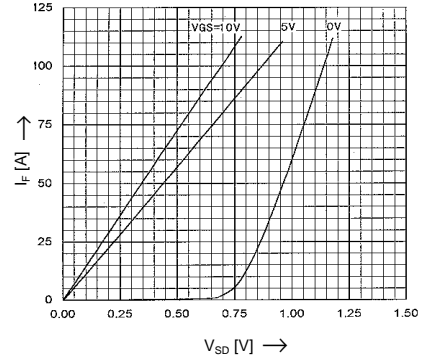
Typical Gate Charge Characteristic

$V_{GS} = f(Q_g)$ ;  $I_D = 50\text{A}$ ;  $T_{ch} = 25^\circ\text{C}$



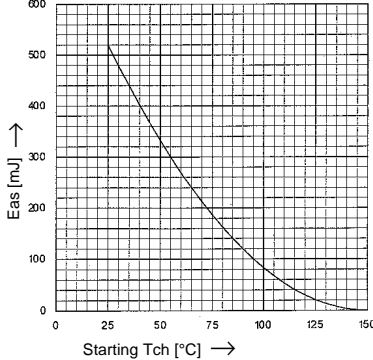
Forward Characteristics of Reverse Diode

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



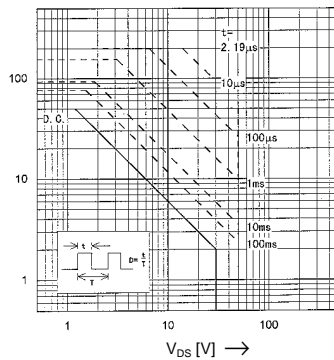
Avalanche Energy Derating

$E(AV) = f(\text{starting } T_{ch})$ ;  $V_{CC} = 12\text{V}$ ;  $I_{AV} = 50\text{A}$



Safe operation area

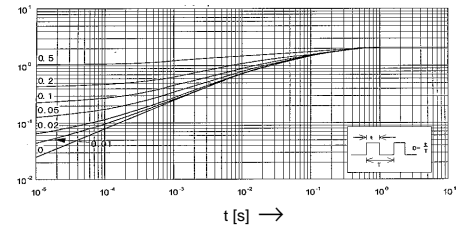
$I_D = f(V_{DS})$ ;  $D = 0.01$ ;  $T_{ch} = 25^\circ\text{C}$



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

Transient Thermal impedance

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



N-channel MOS-FET			
30V	0,017Ω	±50A	60W

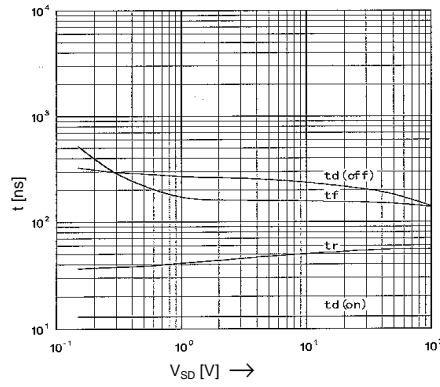
# 2SK2688-01

## FAP-IIS Series

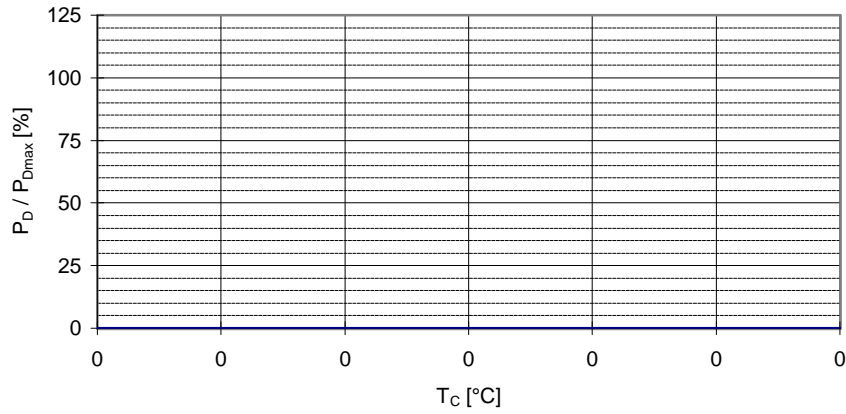


### > Characteristics

Typical Switching Characteristics



Power Dissipation  
 $P_D = f(T_C)$



Maximum Avalanche Current vs. starting  $T_{ch}$   
 $I_{AV} = f(\text{starting } T_{ch})$

