

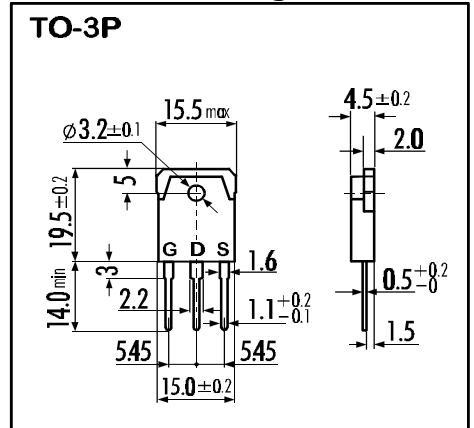
> **Features**

- High Current
- Low On-Resistance
- No Secondary Breakdown
- Low Driving Power
- High Forward Transconductance
- Avalanche Proof
- Including G-S Zener-Diode

> **Applications**

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

> **Outline Drawing**

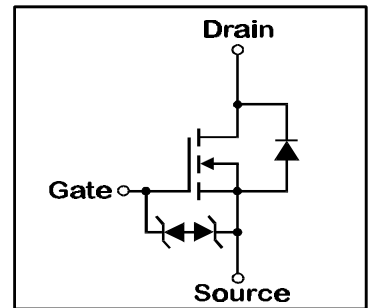


> **Maximum Ratings and Characteristics**

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

Item	Symbol	Rating	Unit
Drain-Source-Voltage	V <sub>DS</sub>	60	V
Drain-Gate-Voltage (R <sub>GS</sub> =20KΩ)	V <sub>DGR</sub>	60	V
Continous Drain Current	I <sub>D</sub>	40	A
Pulsed Drain Current	I <sub>D(puls)</sub>	160	A
Gate-Source-Voltage	V <sub>GS</sub>	±20	V
Max. Power Dissipation	P <sub>D</sub>	100	W
Operating and Storage Temperature Range	T <sub>ch</sub>	150	°C
	T <sub>stg</sub>	-55 ~ +150	°C

> **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	V <sub>(BR)DSS</sub>	I <sub>D</sub> =1mA V <sub>GS</sub> =0V	60			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> =60V T <sub>ch</sub> =25°C			500	μA
		V <sub>GS</sub> =0V T <sub>ch</sub> =125°C			1,0	mA
Gate Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±16V V <sub>DS</sub> =0V			10,0	μA
Drain Source On-State Resistance	R <sub>DS(on)</sub>	I <sub>D</sub> =20A V <sub>GS</sub> =4V		0,03	0,05	Ω
		I <sub>D</sub> =20A V <sub>GS</sub> =10V		0,02	0,03	Ω
Forward Transconductance	g <sub>fs</sub>	I <sub>D</sub> =20A V <sub>DS</sub> =25V	13	25		S
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V		1600	2400	pF
Output Capacitance	C <sub>oss</sub>	V <sub>GS</sub> =0V		580	870	pF
Reverse Transfer Capacitance	C <sub>rss</sub>	f=1MHz		320	480	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> =30V I <sub>D</sub> =40A		15	23	ns
			t <sub>r</sub>		90	140
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 R <sub>GS</sub> =25Ω		300	450	ns
			t <sub>f</sub>		190	290
Avalanche Capability	I <sub>AV</sub>	L = 100μH T <sub>ch</sub> =25°C	40			A
Continous Reverse Drain Current	I <sub>DR</sub>				40	A
Pulsed Reverse Drain Current	I <sub>DRM</sub>				160	A
Diode Forward On-Voltage	V <sub>SD</sub>	I <sub>F</sub> =2I <sub>DR</sub> V <sub>GS</sub> =0V T <sub>ch</sub> =25°C		1,4		V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> =I <sub>DR</sub> V <sub>GS</sub> =0V		80		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			35	°C/W
	R <sub>th(ch-c)</sub>	channel to case			1,25	°C/W

# N-channel MOS-FET

60V 0,03Ω 40A 100W

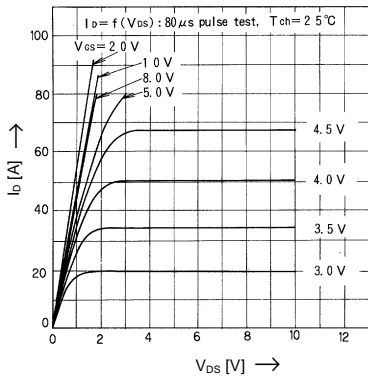
# 2SK2165-01

## FAP-III A Series

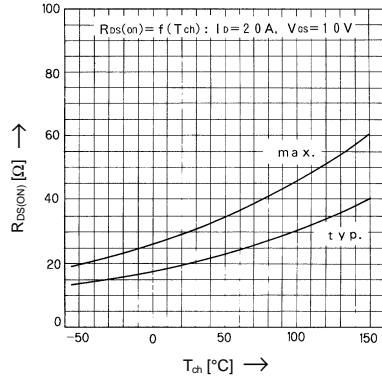


### > Characteristics

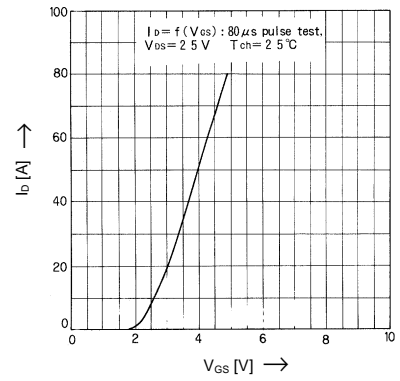
Typical Output Characteristics



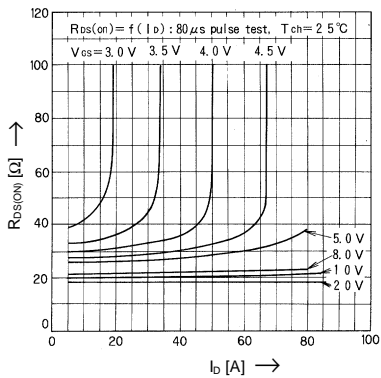
Drain-Source-On-State Resistance vs.  $T_{ch}$



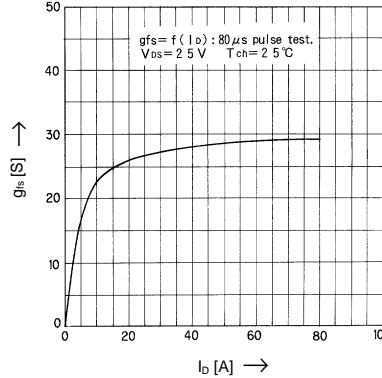
Typical Transfer Characteristics



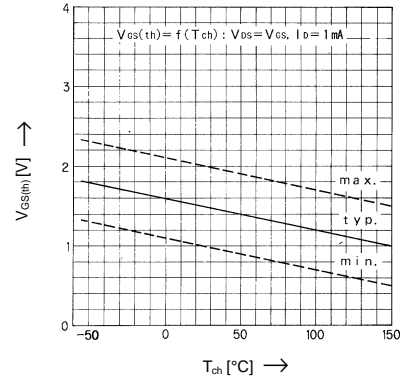
Typical Drain-Source-On-State-Resistance vs.  $I_D$



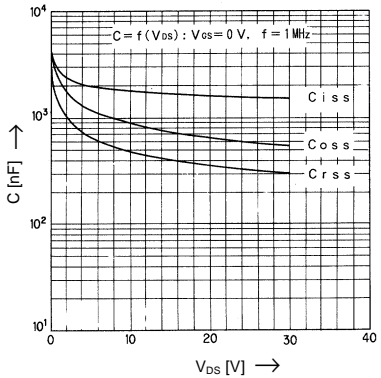
Typical Forward Transconductance vs.  $I_D$



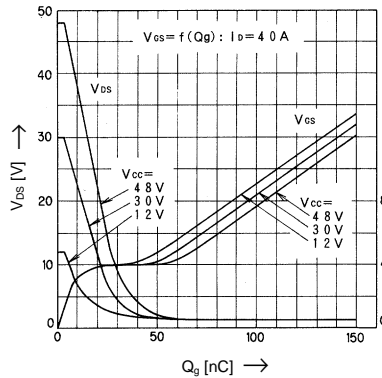
Gate Threshold Voltage vs.  $T_{ch}$



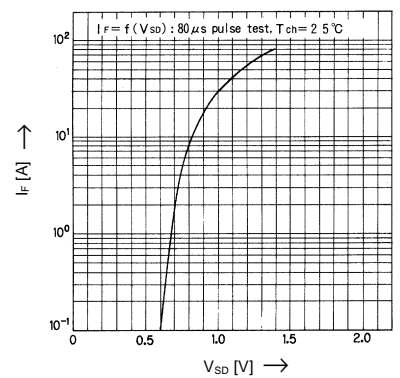
Typical Capacitance vs.  $V_{DS}$



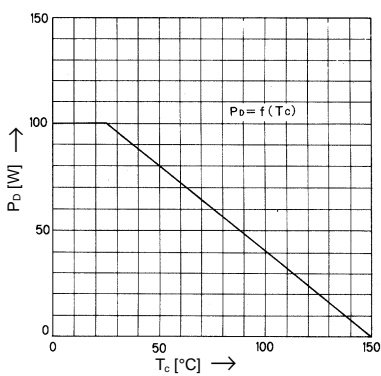
Typical Input Charge



Forward Characteristics of Reverse Diode



Allowable Power Dissipation vs.  $T_c$



Safe operation area

