N-Channel MOS FET

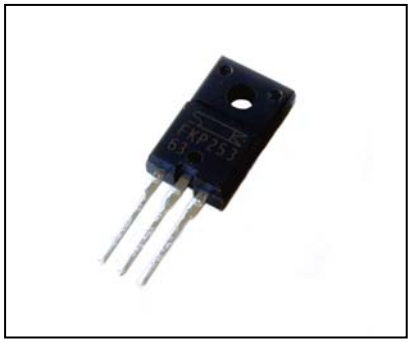
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■Features

- ●Low on-resistance
- ●Low input capacitance
- ●Avalanche energy capability guaranteed

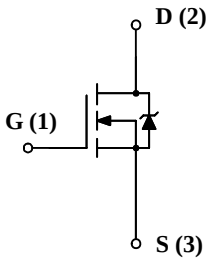
■Package---FM20 (TO220 Full Mold)



■Applications

- ●PDP driving
- ●High speed switching

■Equivalent circuit



■Absolute maximum ratings

(Ta=25°C)

Parameter	Symbol	Rating	Unit
Drain to Source Voltage	VDSS	250	V
Gate to Source Voltage	VGSS	±30	V
Continuous Drain Current	ID	±20A	A
Pulsed Drain Current	ID(pulse) *1	±80A	A
Maximum Power Dissipation	PD	40 (Tc=25°C)	W
Single Pulse Avalanche Energy	EAS *2	160	mJ
Avalanche Current	IAS	20	A
Channel Temperature	Tch	150	°C
Storage Temperature	Tstg	−55 to 150	°C

*1 PW≤100μs, duty cycle≤1%

*2 VDD=20V, L=740μH, ILp=20A, unclamped, RG=50Ω, See Fig.1

Electrical characteristics

(Ta=25°C)

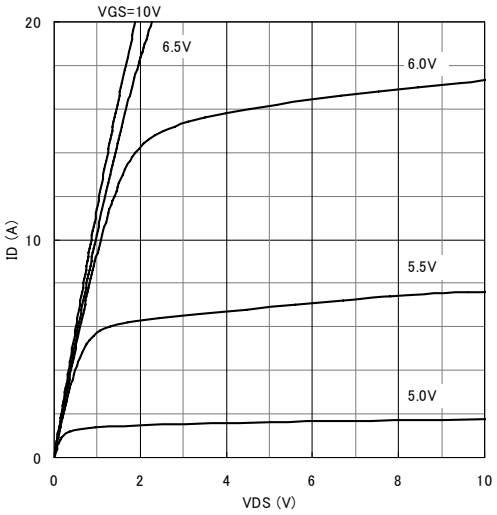
Parameter	Symbol	Test Conditions	Limits			Unit
			MIN.	TYP.	MAX.	
Drain to Source breakdown Voltage	V(BR)DSS	ID=100μA,VGS=0V	250			V
Gate to Source Leakage Current	IGSS	VGS=±30V			±100	nA
Drain to Source Leakage Current	IDSS	VDS=250V, VGS=0V			100	μA
Gate Threshold Voltage	VTH	VDS=10V, ID=1mA	3.0		4.5	V
Forward Transconductance	Re(Yfs)	VDS=10V, ID=10A	8	17		S
Static Drain to Source On-Resistance	RDS(on)	ID=10A, VGS=10V		86	95	mΩ
Input Capacitance	Ciss	VDS=25V VGS=0V f=1MHz		1600		pF
Output Capacitance	Coss			280		
Reverse Transfer Capacitance	Crss			50		
Turn-On Delay Time	td(on)	ID=10A, VDD≈120V RL=12Ω, VGS=10V RG=5Ω See Fig.2		30		ns
Rise Time	tr			60		
Turn-Off Delay Time	td(off)			80		
Fall Time	tf			45		
Source-Drain Diode Forward Voltage	VSD	ISD=20A,VGS=0V		1.0	1.5	V
Source-Drain Diode Reverse Recovery Time	trr	ISD=20A,VGS=0V di/dt=100A/μs		140		ns

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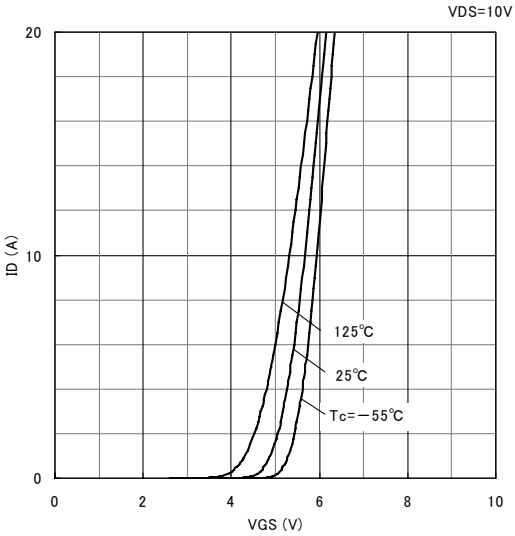
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Characteristic Curves (Tc=25℃)

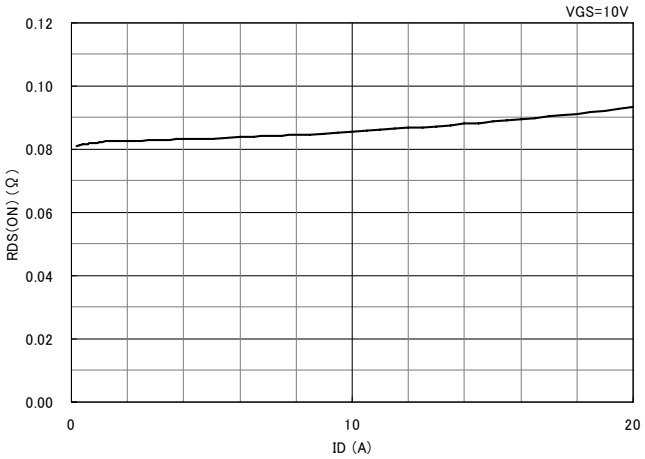
ID-VDS Characteristics (typical)



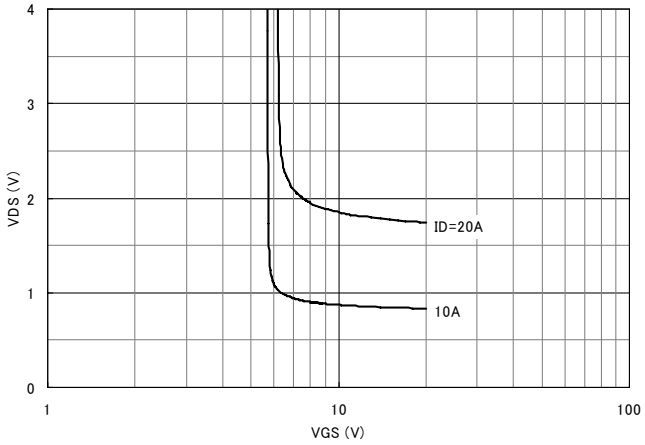
ID-VGS Characteristics (typical)



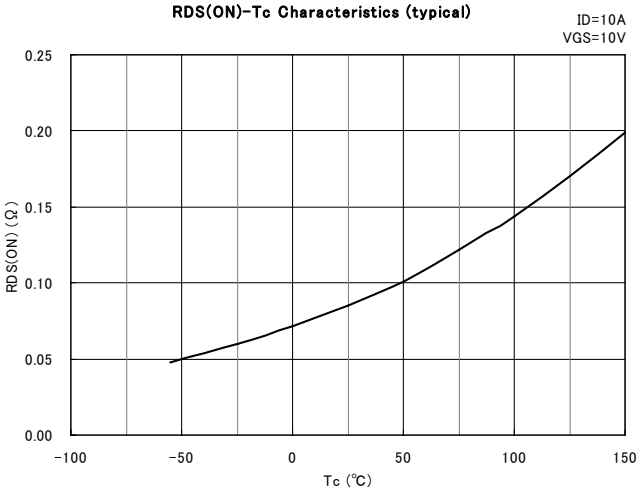
RDS(ON)-ID Characteristics (typical)



VDS-VGS Characteristics (typical)



RDS(ON)-Tc Characteristics (typical)

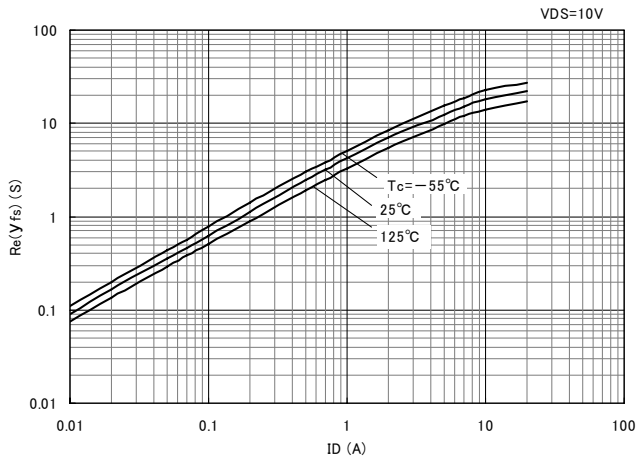


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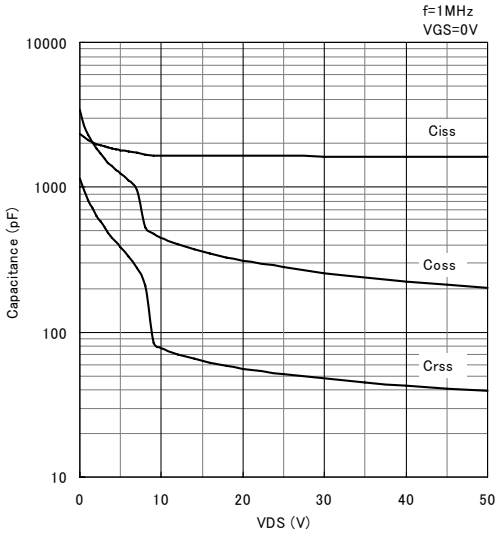
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Characteristic Curves (Tc=25℃)

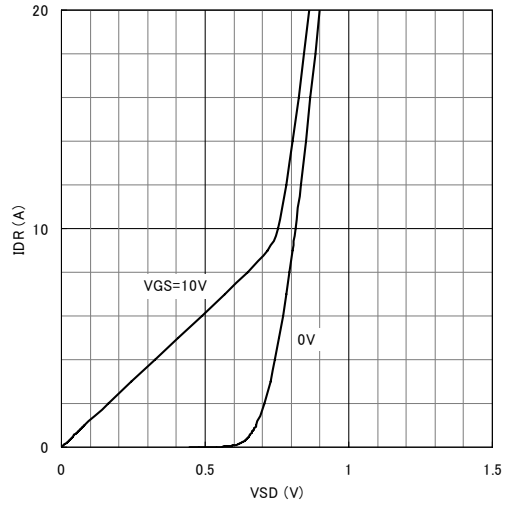
Re(yfs)-ID Characteristics (typical)



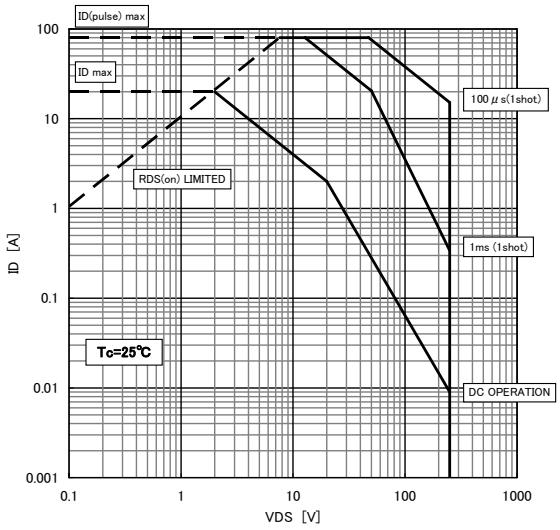
Capacitance-VDS Characteristics (typical)



IDR-VSD Characteristics (typical)



SAFE OPERATING AREA



PD-Ta Characteristics

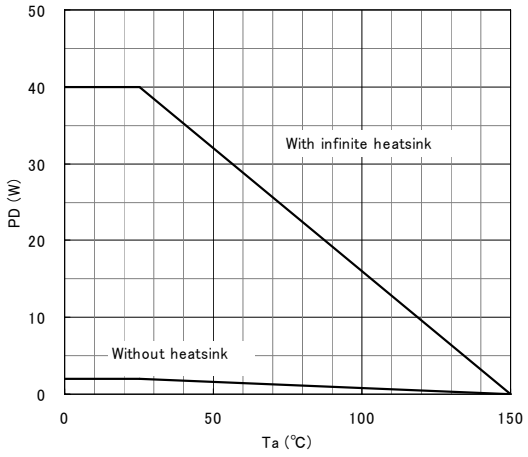
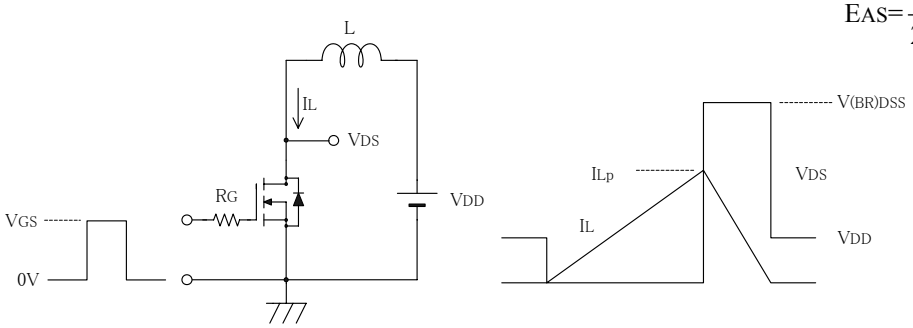


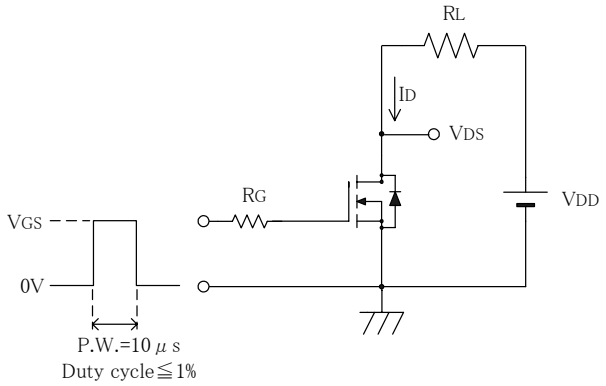
Fig.1 Unclamped Inductive Test Method

$$E_{AS}=\frac{1}{2}\cdot L\cdot I_{LP}^{2}\cdot\frac{V_{(BR)DSS}}{V_{(BR)DSS}-V_{DD}}$$



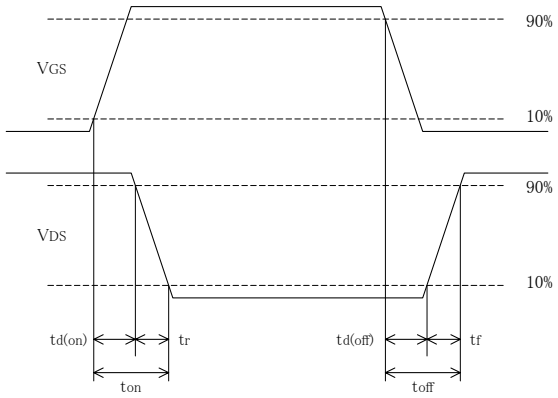
(a) Test Circuit (b) Waveforms

Fig.2 Switching Time Test Method



VDD≈120V
ID=10A
RL=12Ω
VGS=10V
RG=5Ω

(a) Test Circuit



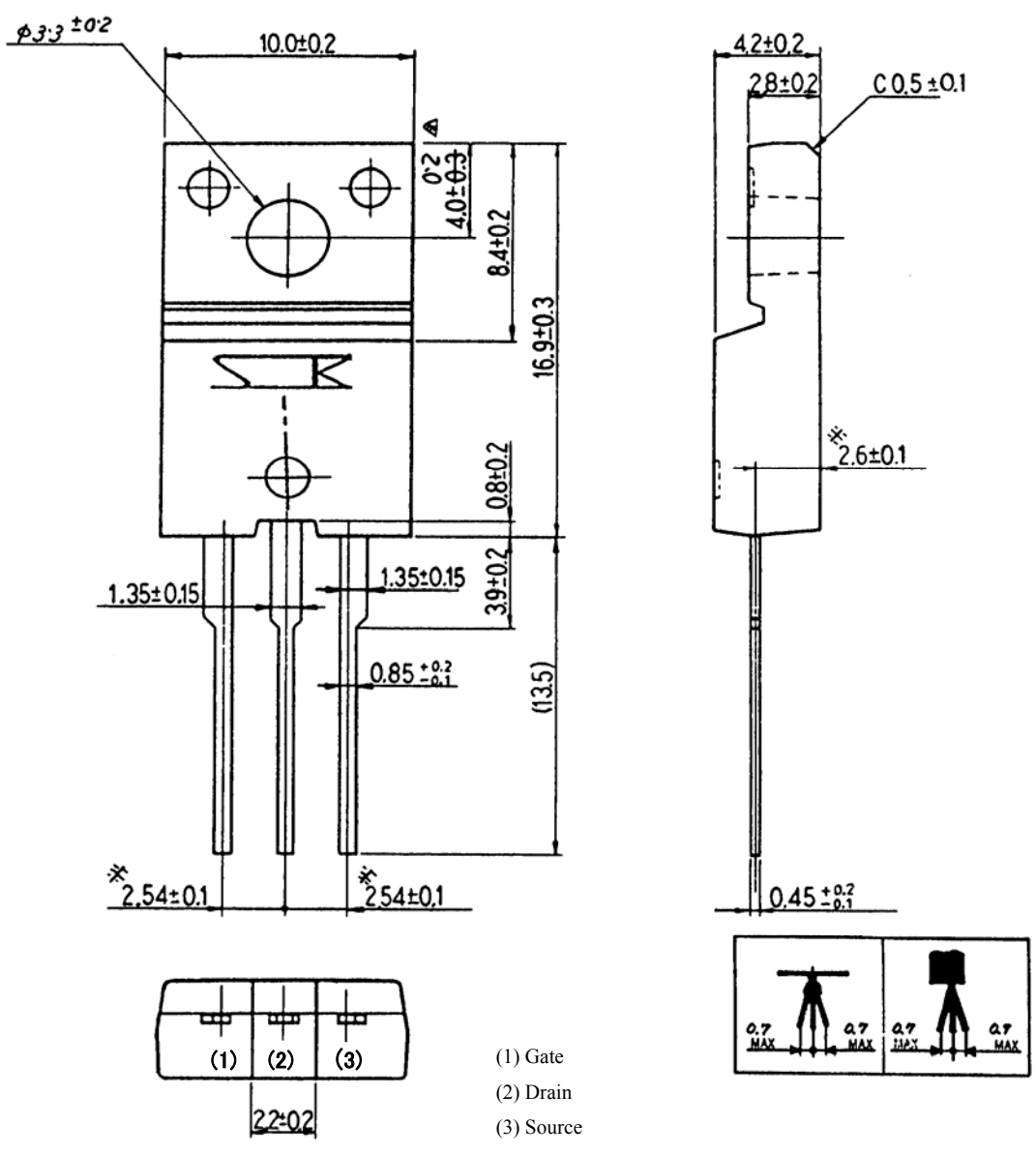
(b) Waveforms

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External dimensions

FM20 (TO220 Full Mold)



(1) Gate
(2) Drain
(3) Source

Weight Approx. 2g

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