

Trench Power MOSFET series

N-Channel enhancement mode power MOSFET

■ Features

Low on-state resistance
Low switching loss
175°C Channel Temperature
100% avalanche tested

■ Applications

Automotive switching applications

■ Absolute Maximum Ratings at Tc=25°C(unless otherwise specified)

Description	Symbol	Characteristics	Unit	Remarks
Drain-Source Voltage	V_{DS}	60	V	
	V_{DSX}	30	V	$V_{GS}=-20V$
Continuous Drain Current	I_D	± 100	A	
Pulsed Drain Current	I_{DP}	± 400	A	
Gate-Source Voltage	V_{GS}	+30/-20	V	
Non-Repetitive Maximum Avalanche current	I_{AS}	100	A	Note*1
Non-Repetitive Maximum Avalanche Energy	E_{AS}	559.2	mJ	Note*2
Maximum Power Dissipation	P_D	282	W	
Operating and Storage Temperature range	T_{ch}	175	°C	
	T_{stg}	-55 to +175	°C	

Note*1 : $T_{ch} \leq 175^{\circ}\text{C}$, See Fig.1 and Fig.2

Note*2 : Starting Tch=25°C, L=37μH, V_{CC}=48V, RG=50Ω, See Fig.1 and Fig.2

E_{AS} limited by maximum channel temperature and avalanche current.

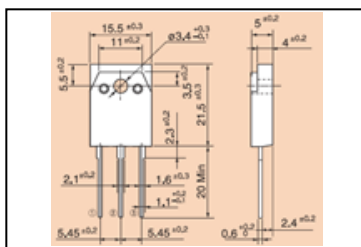
See to Avalanche Energy graph of page 4

■Electrical Characteristics at Tc=25°C(unless otherwise specified)

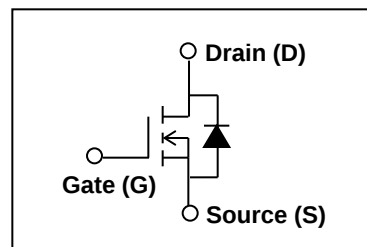
Static Ratings

Static Ratings							
Description	Symbol	Conditions		Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =1mA V _{GS} =0V		60	—	—	V
	BV _{DSX}	I _D =1mA V _{GS} =-20V		20	—	—	V
Gate Threshold Voltage	V _{GS(th)}	I _D =10mA V _{DS} = V _{GS}		2.5	3.0	3.5	V
Zero Gate Voltage Drain current	I _{DSS}	V _{DS} = 60V V _{GS} =0V	Ta=25°C	—	1	100	μA
Gate-Source Leakage current	I _{GSS}	V _{GS} =+30V/-20V V _{DS} = 0V		—	10	100	nA
Drain-Source On-State Resistance	R _{DS(on)}	I _D =50A V _{GS} =10V		—	5.0	6.5	mΩ

■ Outline Drawings [mm]



■ Equivalent circuit schematic



Dynamic Ratings

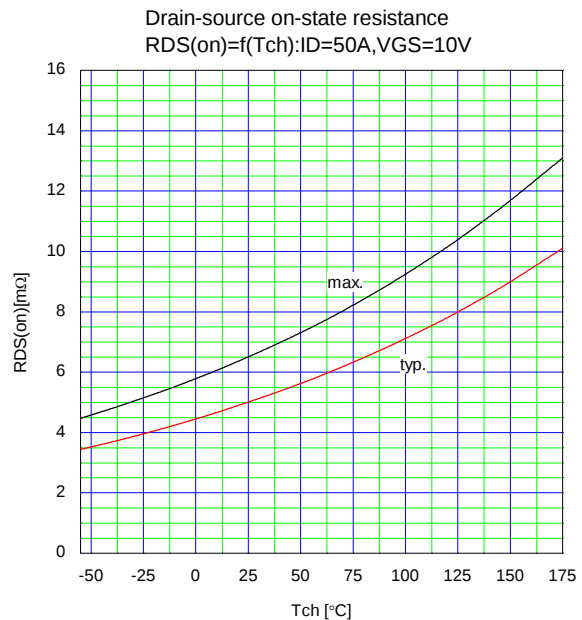
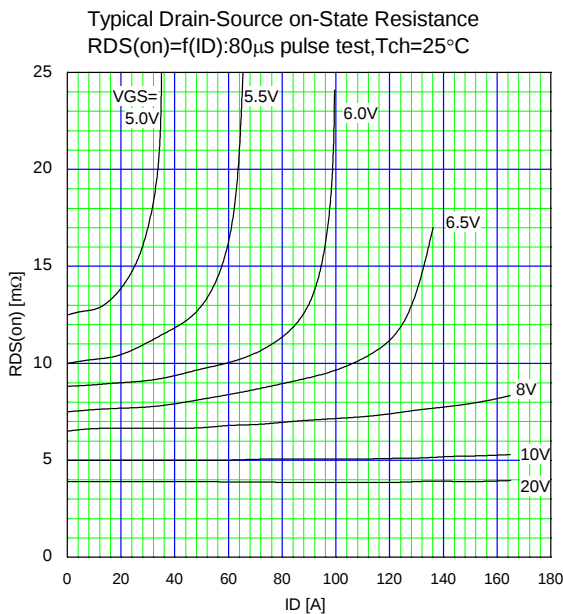
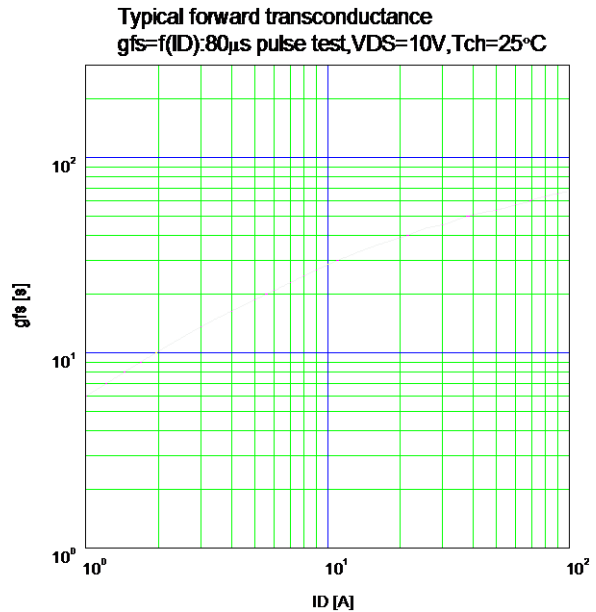
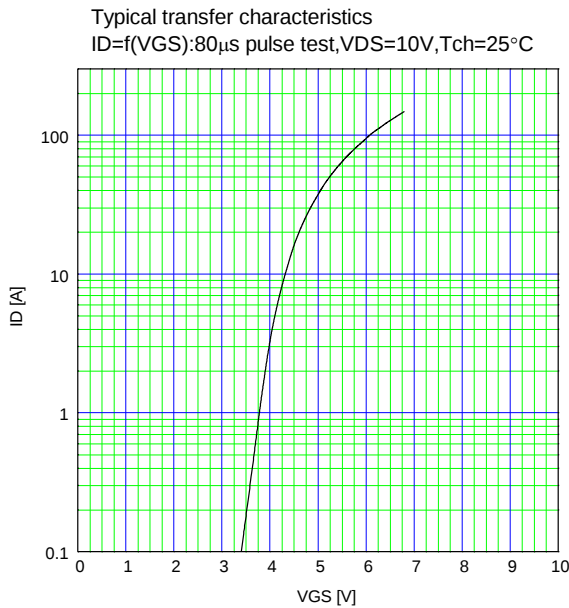
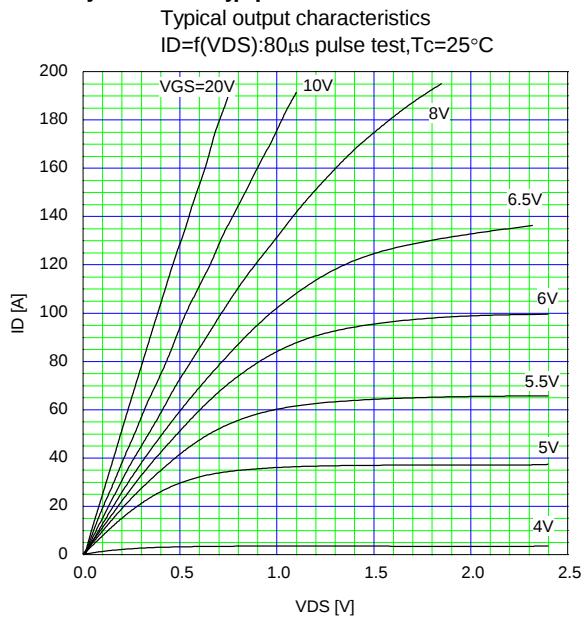
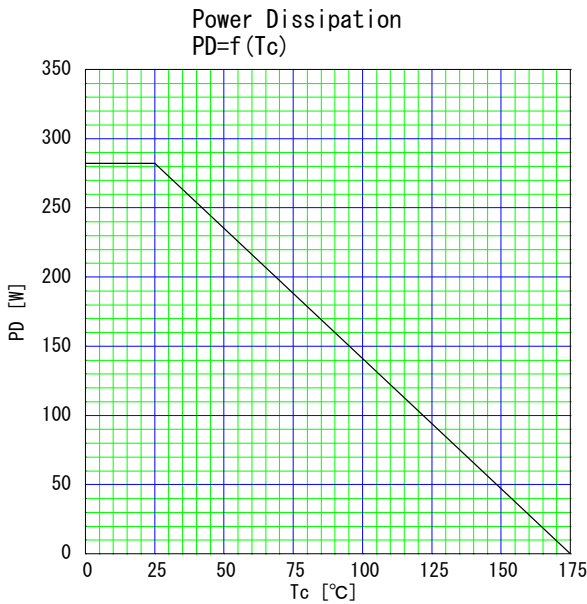
Description	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Transconductance	g_{fs}	$I_D=50A$ $V_{DS}=10V$	25	50	—	S
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1MHz$	—	9000	—	pF
Output Capacitance	C_{oss}		—	1250	—	
Reverse Transfer Capacitance	C_{rss}		—	700	—	
Turn-On Time	$t_{d(on)}$	$V_{CC}=30V, V_{GS}=10V$ $I_D=100A, R_G=10\Omega$ See Fig.3 and Fig.4	—	50	—	ns
	t_r		—	200	—	
Turn-Off Time	$t_{d(off)}$		—	150	—	
	t_f		—	135	—	
Total Gate Charge	Q_G	$V_{DD}=30V, I_D=100A$ $V_{GS}=10V$ See Fig.5	—	145	—	nC
Gate-Source Charge	Q_{GS}		—	60	—	
Gate-Drain Charge	Q_{GD}		—	40	—	

Reverse Ratings

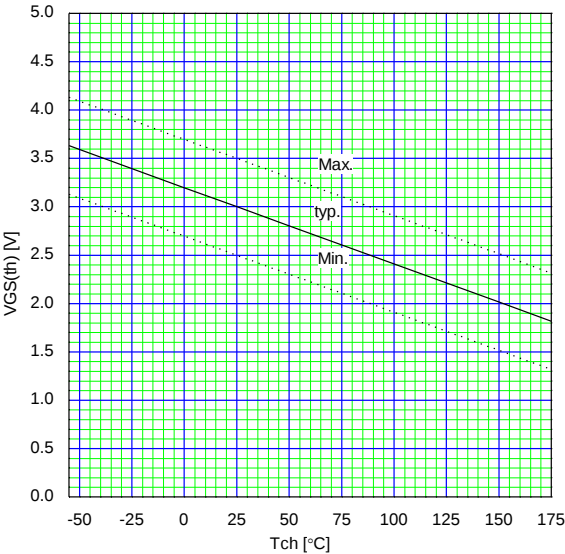
Description	Symbol	Conditions	Min.	Typ.	Max.	Unit
Avalanche Capability	I_{AV}	$L=37\mu H, T_{ch}=25^\circ C$ See Fig.1 and Fig.2	100	—	—	A
Diode Forward On- Voltage	V_{SD}	$I_F=100A, V_{GS}=0V$ $T_{ch}=25^\circ C$	—	1.0	1.5	V
Reverse Recovery Time	t_{rr}	$I_F=50A, V_{GS}=0V$ $-di/dt=100A/\mu s$ $T_{ch}=25^\circ C$	—	85	—	ns
Reverse Recovery Charge	Q_{rr}		—	0.25	—	μC

■ Thermal Characteristics

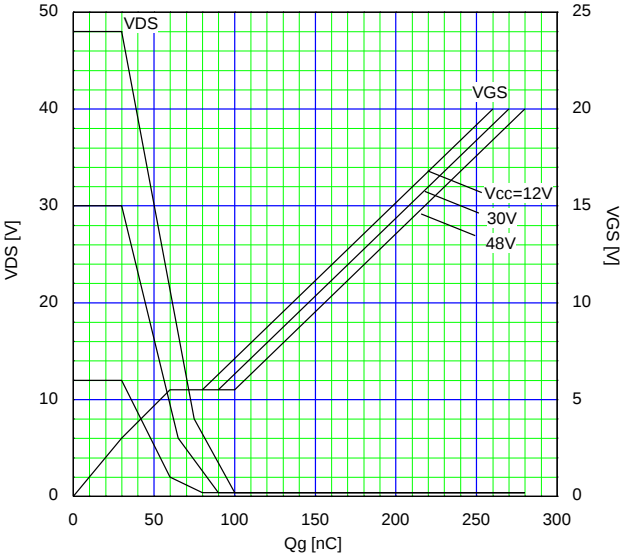
Description	Symbol	Min.	Typ.	Max.	Unit
Cannel to Case	$R_{th(ch-c)}$	—	—	0.532	$^\circ C/W$
Cannel to Ambient	$R_{th(ch-a)}$	—	—	50.0	$^\circ C/W$



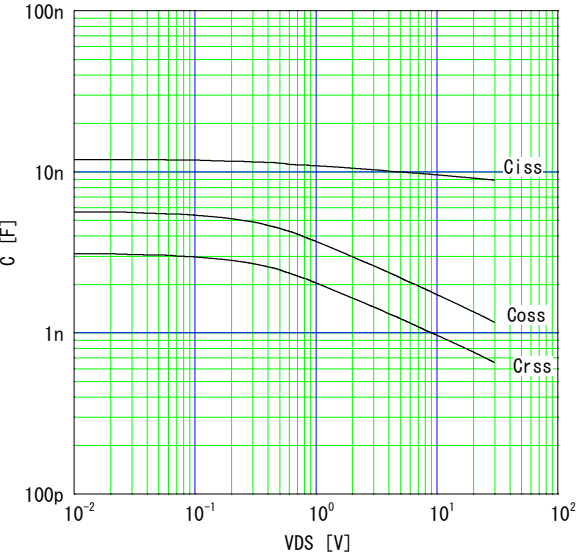
Gate Threshold Voltage vs. T_{ch}
V_{GS(th)}=f(T_{ch}):V_{DS}=V_{GS},I_D=10mA



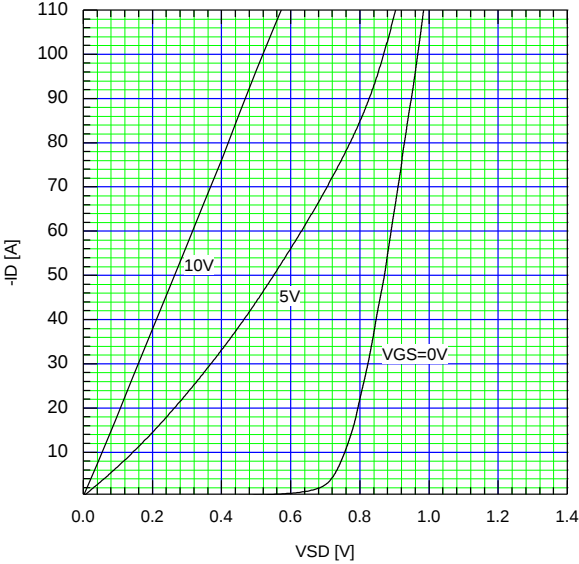
Typical Gate Charge Characteristics
V_{GS}=f(Q_g):I_D=100A,T_{ch}=25°C



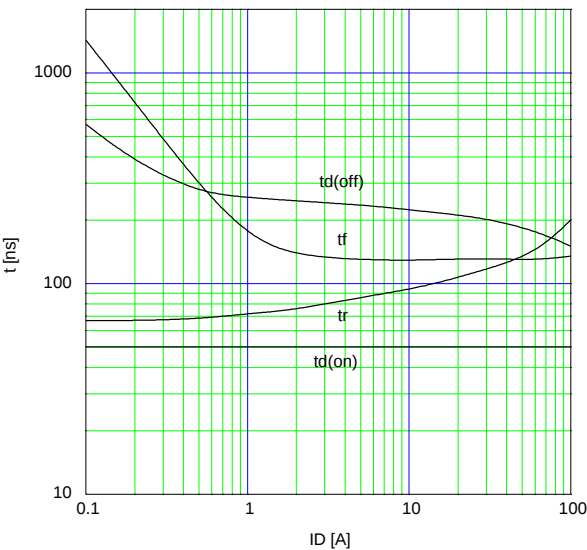
Typical capacitances
C=f(V_{DS}):V_{GS}=0V,f=1MHz



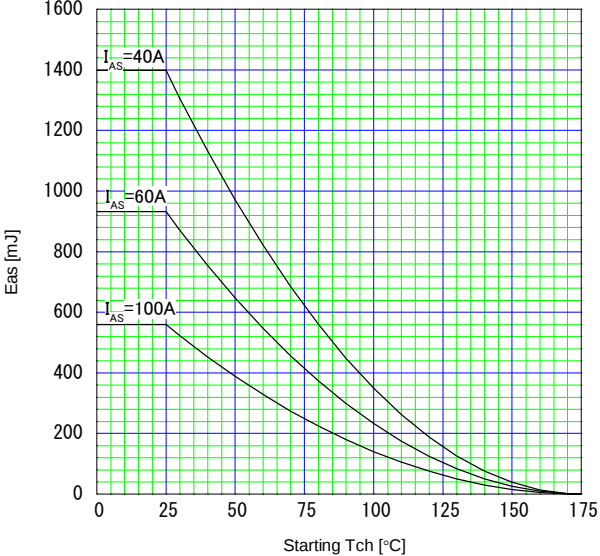
Typical Forward Characteristics of Reverse Diode
-I_D=f(V_{SD}):80μs pulse test,T_{ch}=25°C



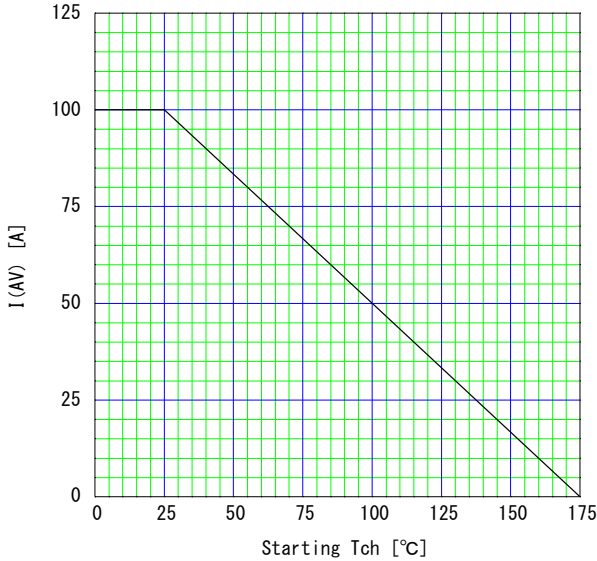
Typical Switching Characteristics vs. I_D
t=f(I_D):V_{CC}=30V,V_{GS}=10V,R_G=10Ω



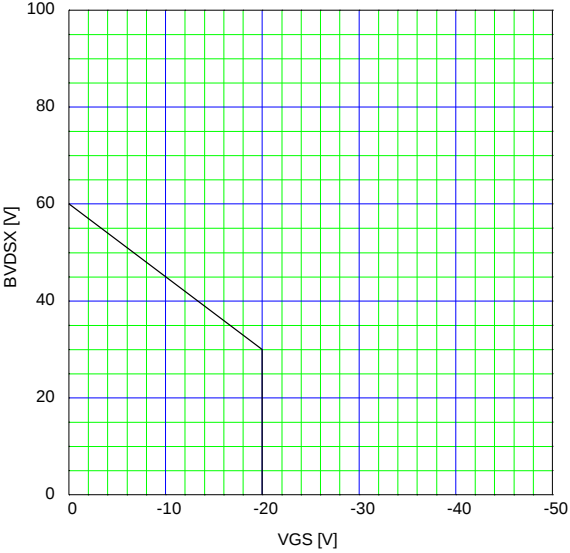
Maximum Avalanche energy vs. starting T_{ch}
E_{as}=f(starting T_{ch}):V_{CC}=48V,I_{AS}≤100A, single pulse



Maximum Avalanche Current vs. starting Tch
 $I(AV)=f(\text{starting Tch})$, single pulse



Drain-Source Breakdown Voltage vs. Vgs
 $BVDSX=f(VGS):Tch=25^{\circ}C$



Transient Thermal Impedance
 $Zth(ch-c)=f(t):D=0$

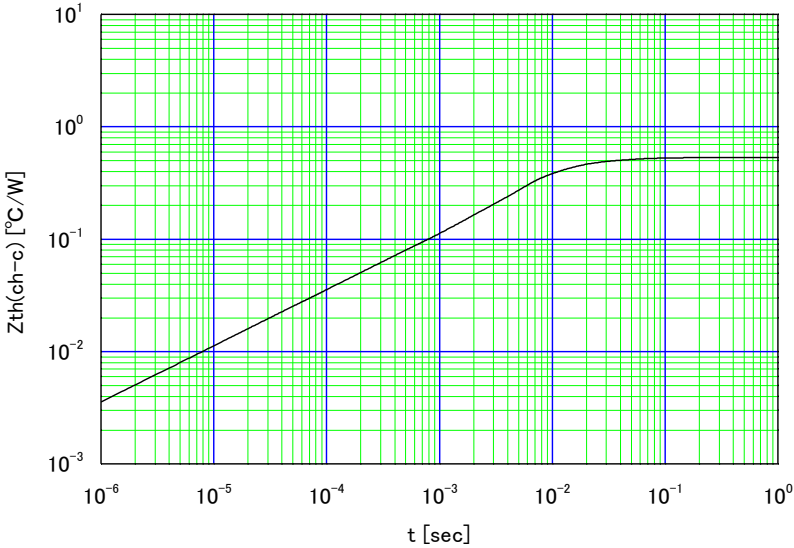


Fig.1 Avalanche Test circuit

Fig.2 Operating waveforms of Avalanche Test

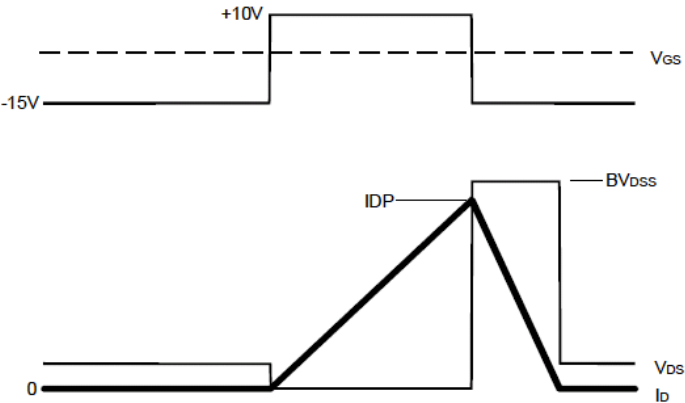
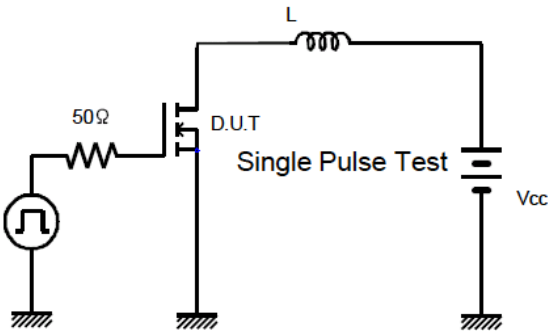


Fig.3 Switching Test circuit

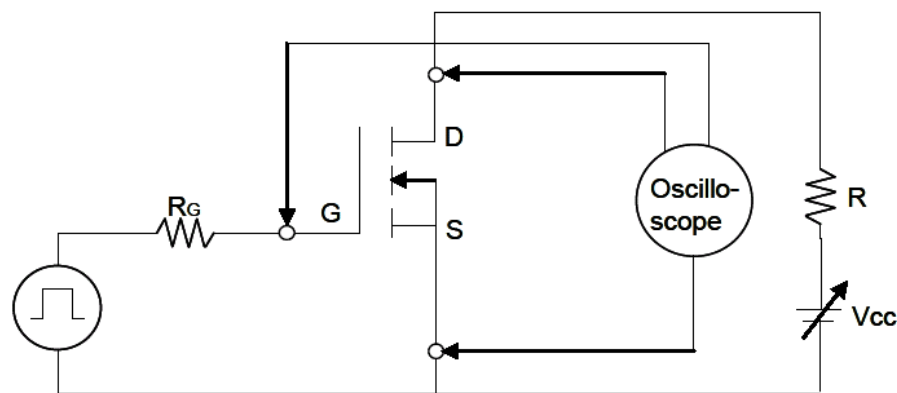


Fig.4 Operating waveform of Switching Test

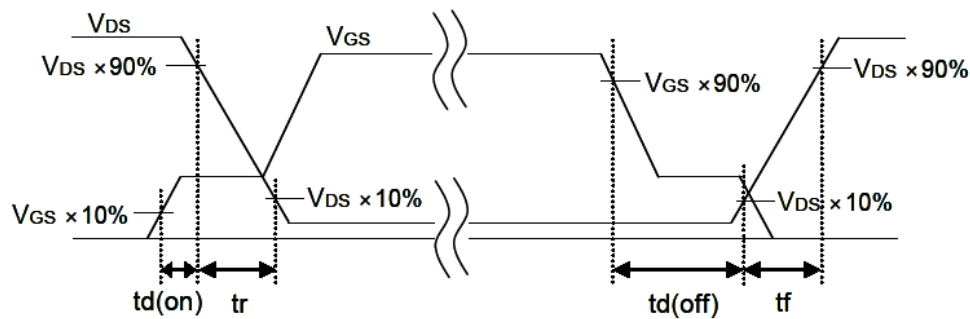


Fig.5 Operating waveform of Gate charge Test

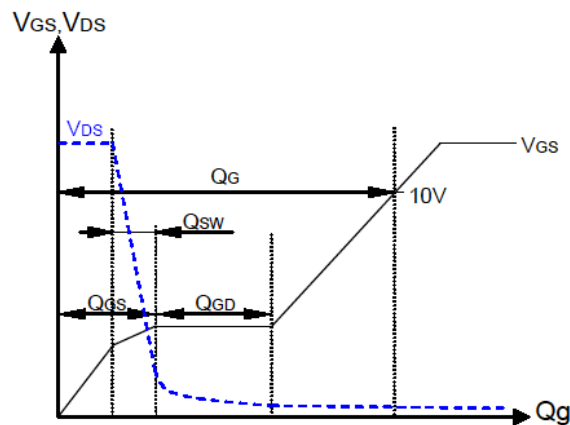
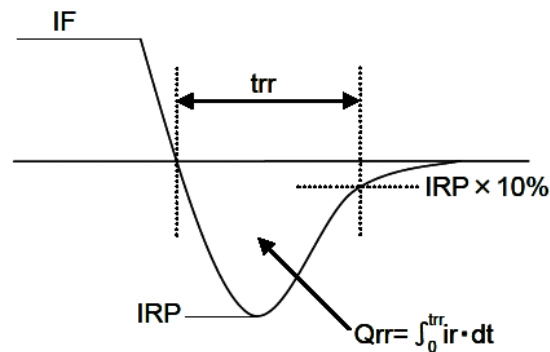


Fig.6 Operating waveform of Body diode Recovery Test

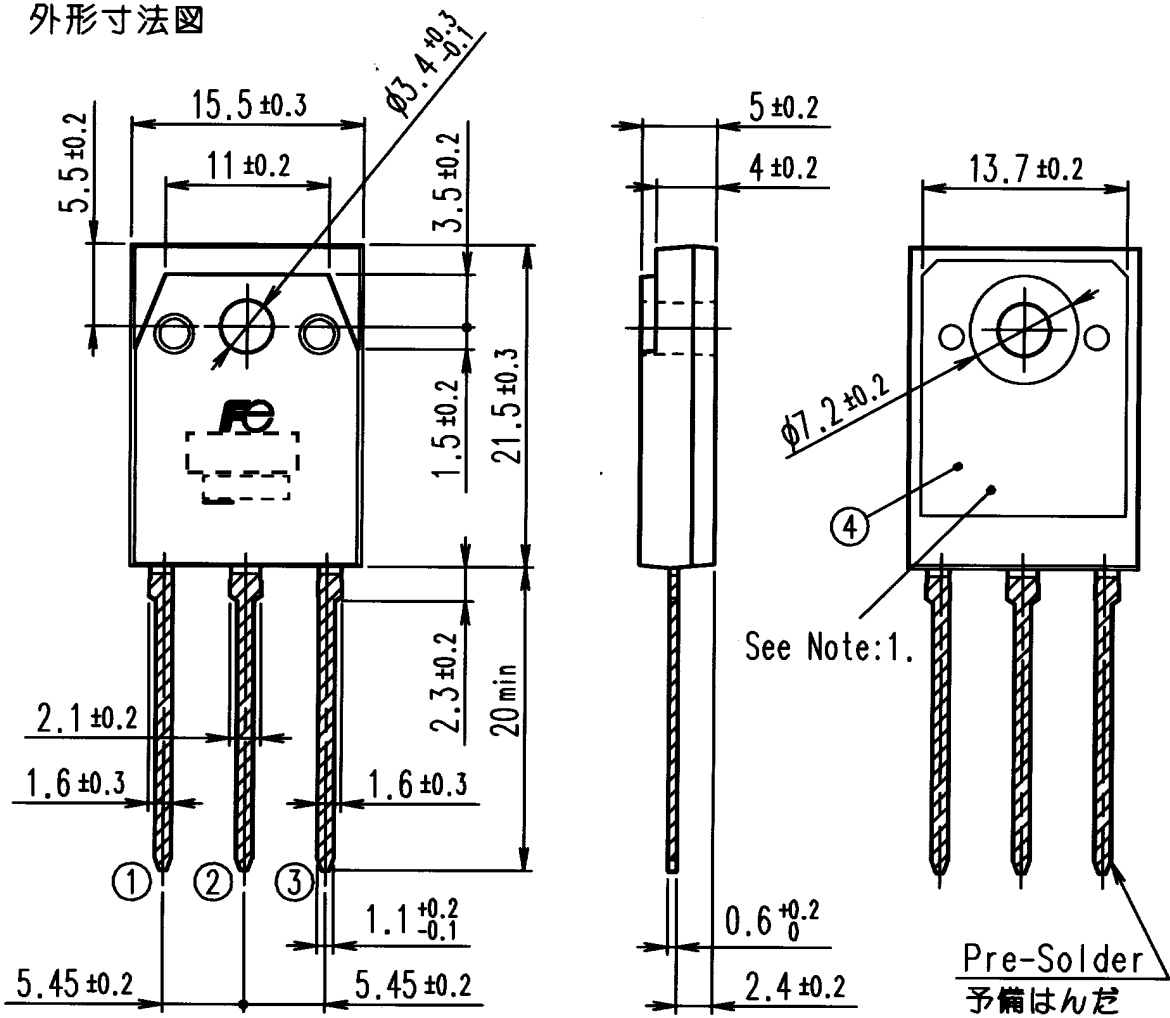


■ Out view

FUJI POWER MOSFET

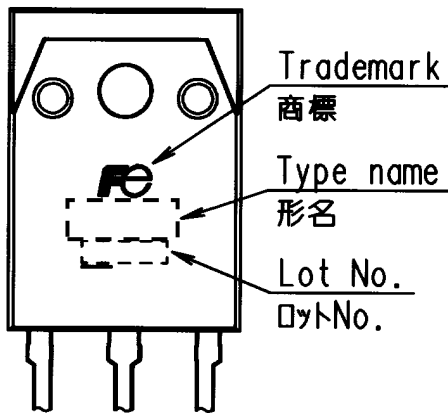
OUT VIEW

外形寸法図



MARKING

表示内容



Note:1. フィン取付面平坦度
30 μ m 以下のこと。

UNIT : mm
寸法単位 : mm

WARNING

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