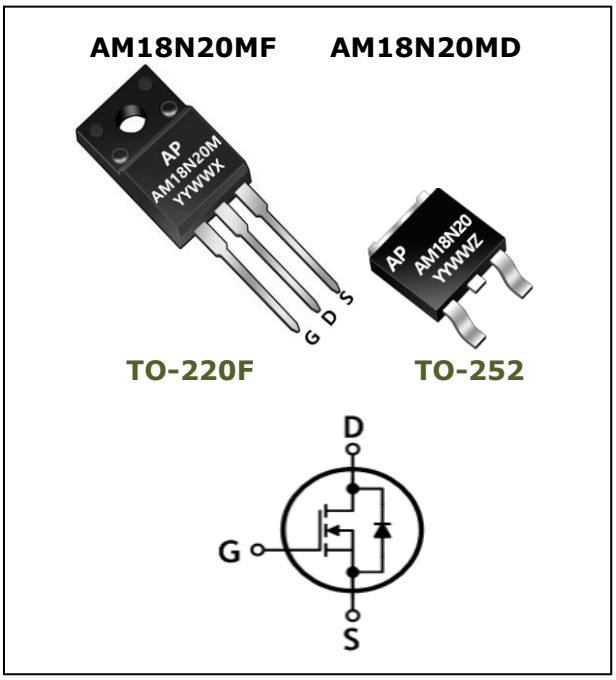
200V 18A Advanced N-Ch Power MOSFET

FEATURES

- High Voltage : BV_{DSS}=200V(Min.)
- Low C_{rss} : C_{rss} =55pF(Typ.)
- Low gate charge : Qg=22nC(Typ.)
- Low $R_{DS(on)}$: $R_{DS(on)}$=0.17Ω(Max.)



Marking Information

Row 1 : AP

Row 2 : Product Information

Row 3 : Date Code

- YY : Year Code
- WW : Week Code

Ordering Information

Part No	Package	Packing	Finish	Halogen	Packing Unit
AM18N20MF	TO-220F	Tube	Sn	Free	5,000EA
AM18N20MD	TO-252	13" REEL & Tape	Sn	Free	2,500EA

Maximum Ratings (T_C=25 °C, unless otherwise noted)

Characteristic	Symbol		Rating	Unit
Drain-source voltage	V_{DSS}		200	V
Gate-source voltage	V_{GSS}		±30	V
Drain current (DC)*	I_D	T_C = 25℃	18	A
		T_C = 100℃	9.1	
Drain current (Pulsed)*	I_{DM}		72	A
Power Dissipation	P_D	TO-220F	50	W
		TO-252	48	
Avalanche current (Single) (Note 2)	I_{AS}		18	A
Single pulsed avalanche energy (Note 2)	E_{AS}		453	mJ
Avalanche current (Repetitive) (Note 1)	I_{AR}		18	A
Repetitive avalanche energy (Note 1)	E_{AR}		13.9	mJ
Junction temperature	T_J		150	℃
Storage temperature range	T_{stg}		-55~150	

***Limited only maximum junction temperature**

Thermal Characteristic (TO-220F)

Characteristic	Symbol	Rating	Unit
Thermal resistance, junction to case	$R_{th(j-c)}$	Max. 2.5	℃/W
Thermal resistance, junction to ambient	$R_{th(j-a)}$	Max. 62.5	

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

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	I_D = 250uA, V_{GS}= 0	200	-	-	V
Gate threshold voltage	$V_{GS(th)}$	I_D = 250uA, V_{DS} = V_{GS}	2	-	4	V
Drain-source cut-off current	I_{DSS}	V_{DS} = 200V, V_{GS} = 0V	-	-	1	uA
		V_{DS} = 200V, T_C=150℃			100	
Gate leakage current	I_{GSS}	V_{DS} = 0V, V_{GS} = ±30V	-	-	±100	nA
Drain-source on-resistance (Note 4)	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 9.0A	-	0.14	0.17	Ω
Forward transfer conductance (Note 4)	g_{fs}	V_{DS} = 10V, I_D = 9.0A	-	10.5	-	S
Input capacitance	C_{iss}	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	942	1240	pF
Output capacitance	C_{oss}		-	227	-	
Reverse transfer capacitance	C_{rss}		-	55	-	
Turn-on delay time (Note 3,4)	$T_{d(on)}$	V_{DS} = 125V, I_D = 18A, RG = 25Ω	-	15	-	ns
Rise time (Note 3,4)	T_r		-	130	-	
Turn-off delay time (Note 3,4)	$t_{d(off)}$		-	135	-	
Fall time (Note 3,4)	t_f		-	105	-	
Total gate charge (Note 3,4)	Q_g	V_{DS} = 160V,V_{GS} = 10V I_D = 18A	-	22	28	nC
Gate-source charge (Note 3,4)	Q_{gs}		-	6.6	-	
Gate-drain charge (Note 3,4)	Q_g		-	7.2	-	

Source-Drain Diode Ratings and Characteristics (T_C=25 °C, unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Source current (DC)	I_S	Integral reverse diode in the MOSFET	-	-	18	A
Source current (Pulsed) (Note 1)	I_{SM}		-	-	72	A
Forward voltage (Note 4)	V_{SD}	V_{GS} = 0V, I_S = 12A	-	-	1.4	V
Reverse recovery time	t_{rr}	I_S = 12A, V_{GS} = 0V dIF/dt = 100A/us	-	208	-	ns
Reverse recovery charge	Q_{rr}		-	1.63	-	uC

Note :

1. Repetitive rating : Pulse width limited by maximum junction temperature.
2. L=2.1mH, I_{AS}=18A, V_{DD}=50V, R_G=25Ω, Starting T_J=25℃
3. Pulse Test : Pulse width ≤ 300us, Duty cycle ≤ 2%
4. Essentially independent of operating temperature

REV. 02

Typical Electrical Characteristic

Fig. 1 I_D - V_{DS}

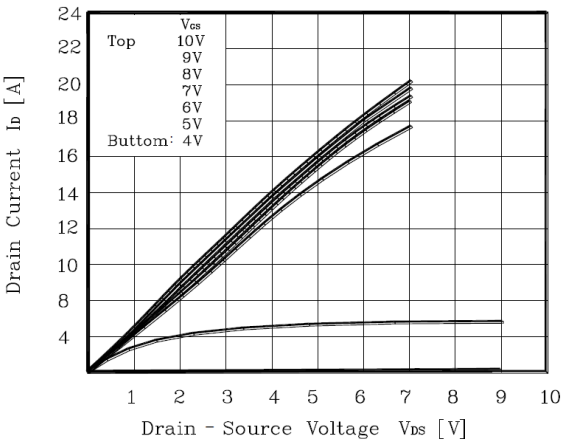


Fig. 2 I_D - V_{GS}

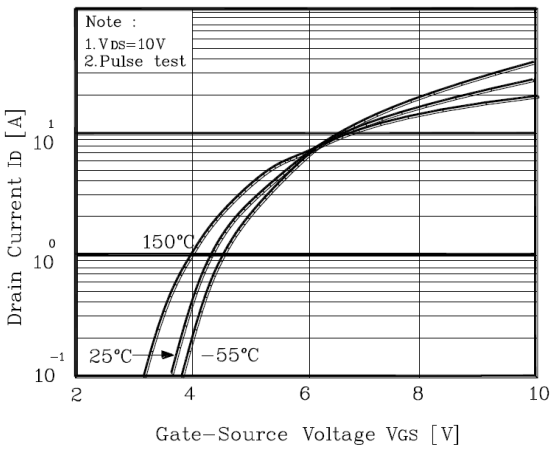


Fig. 3 $R_{DS(on)}$ - I_D

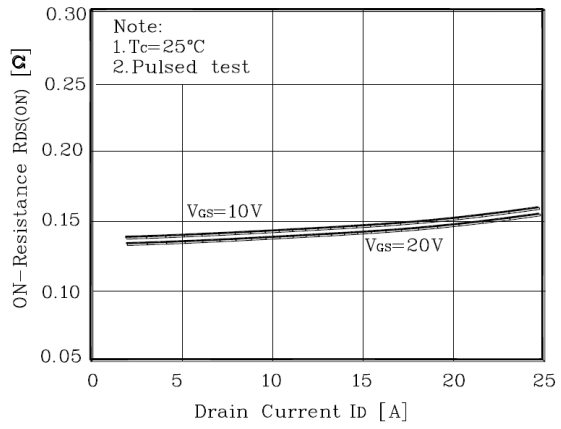


Fig. 4 I_S - V_{SD}

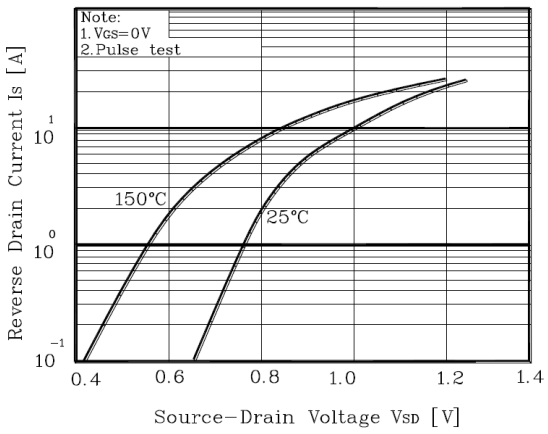


Fig. 5 Capacitance - V_{DS}

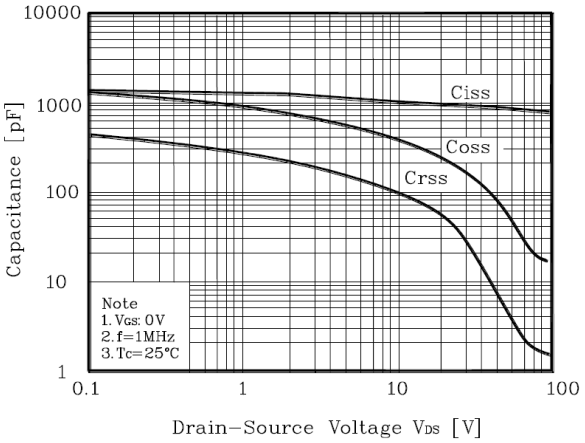
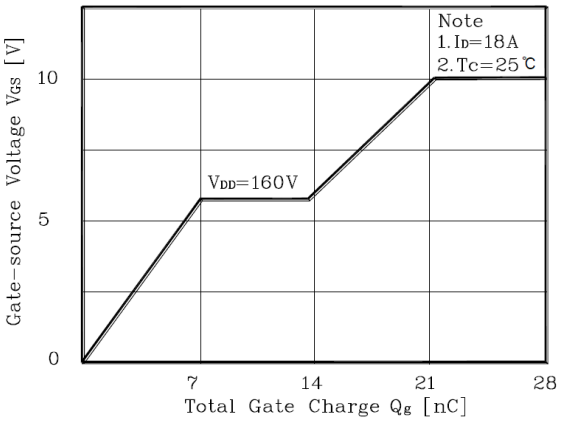


Fig. 6 V_{GS} - Q_G



Typical Electrical Characteristic

Fig. 7 V_{DSS} - T_J

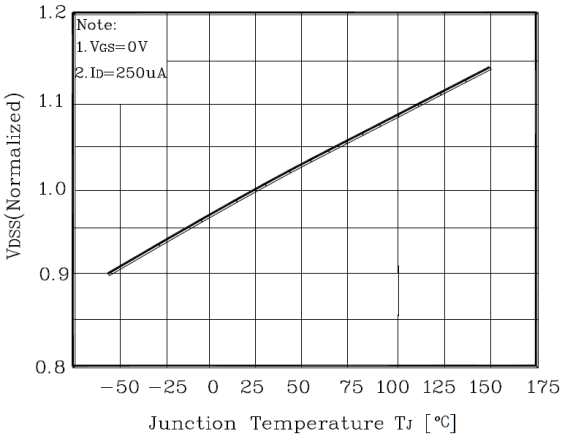


Fig. 8 $R_{DS(on)}$ - T_J

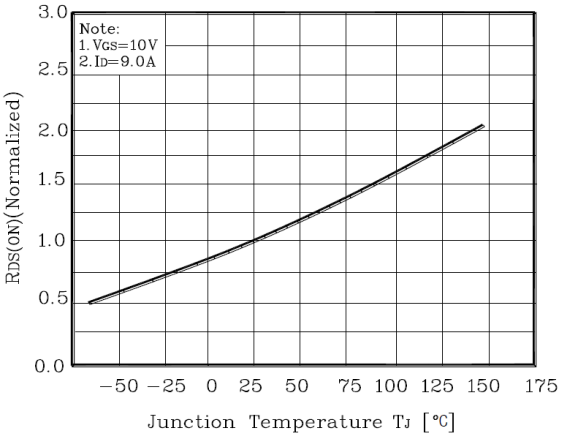


Fig. 9 I_D - T_C

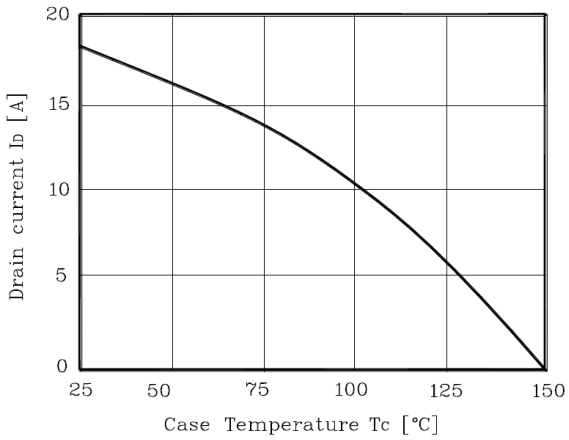
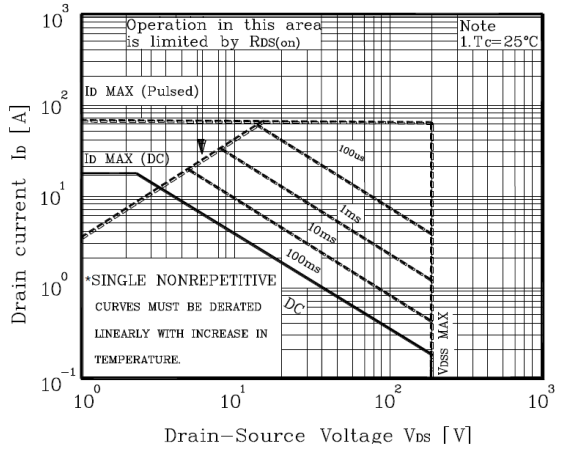


Fig. 10 Safe Operating Area



REV. 02

Fig. 11 Gate Charge Test Circuit & Waveform

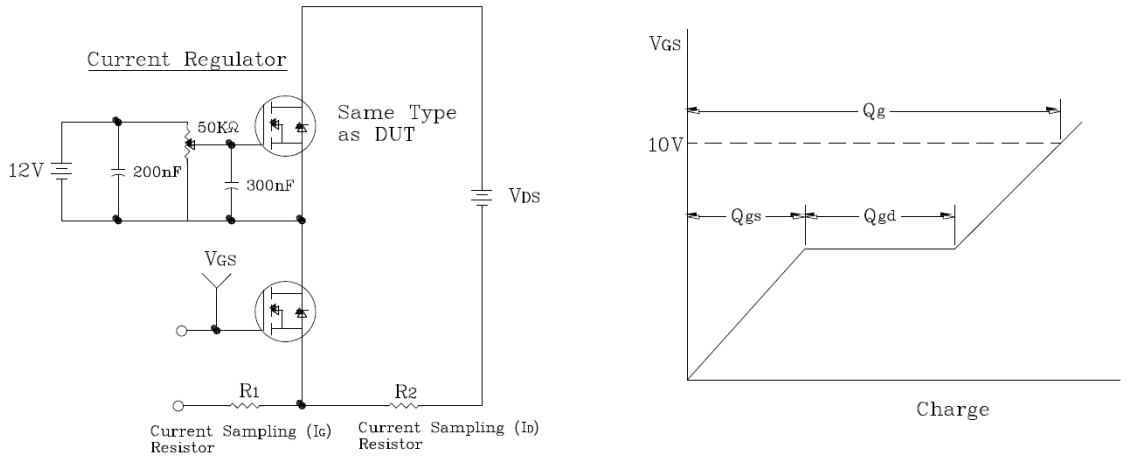


Fig. 12 Resistive Switching Test Circuit & Waveform

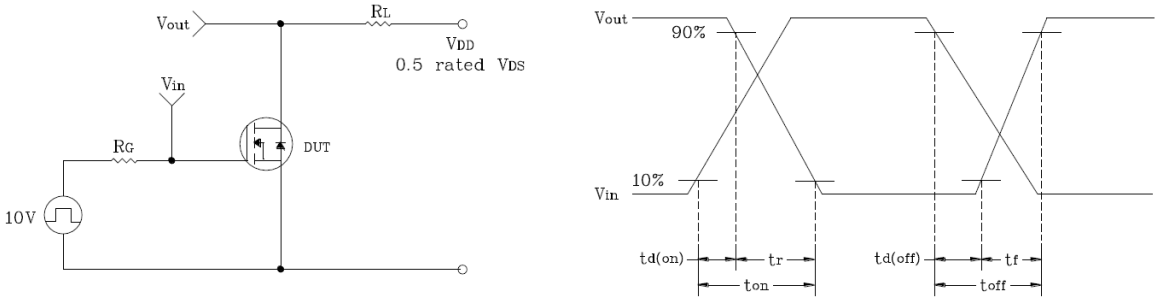


Fig. 13 E_{AS} Test Circuit & Waveform

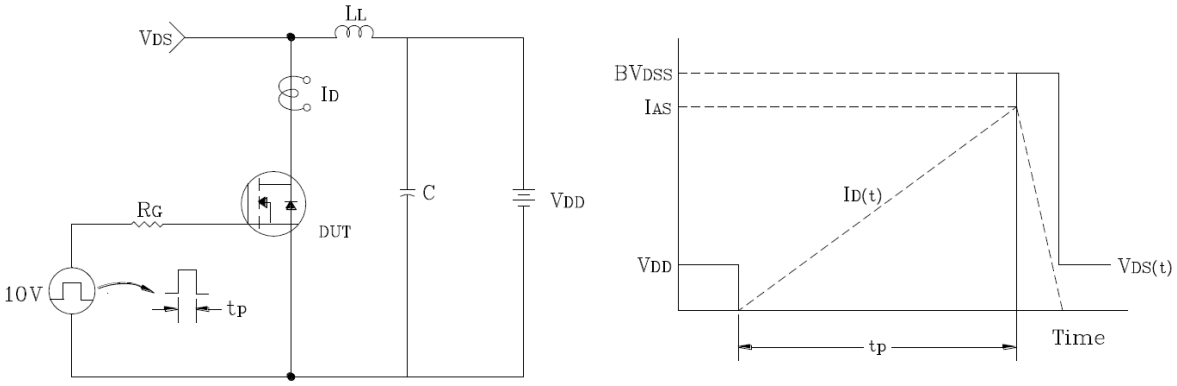
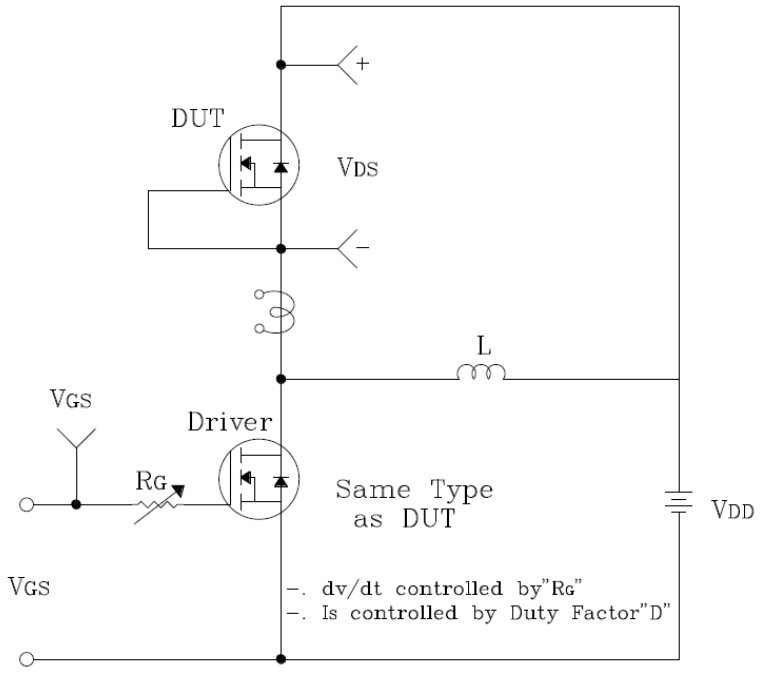
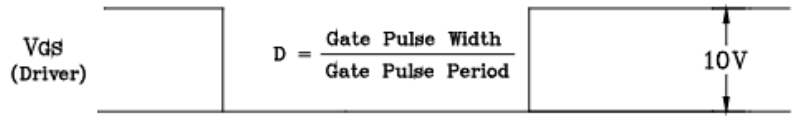
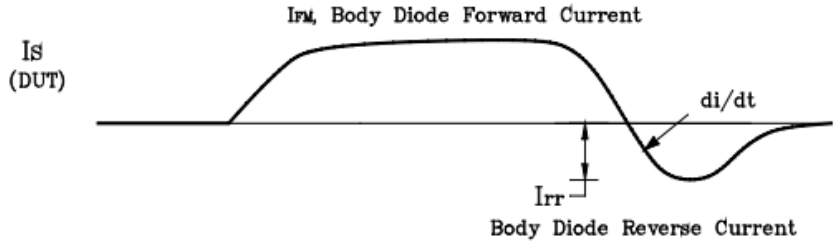
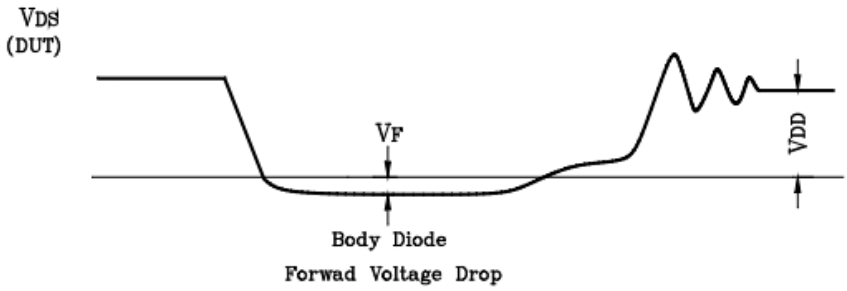


Fig. 14 Diode Reverse Recovery Time Test Circuit & Waveform



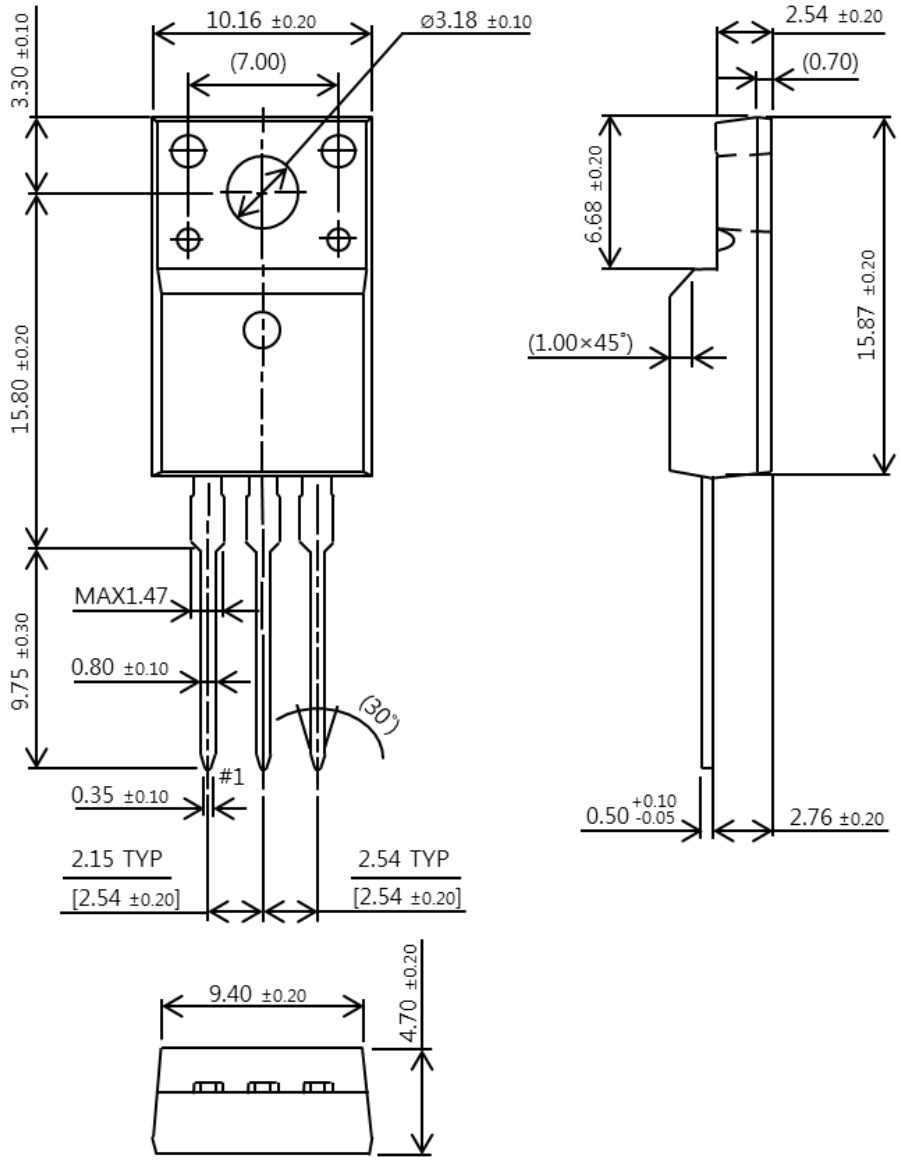

VGS
(Driver)
D = Gate Pulse Width / Gate Pulse Period
10V


IFM, Body Diode Forward Current
IS
(DUT)
di/dt
Irr
Body Diode Reverse Current

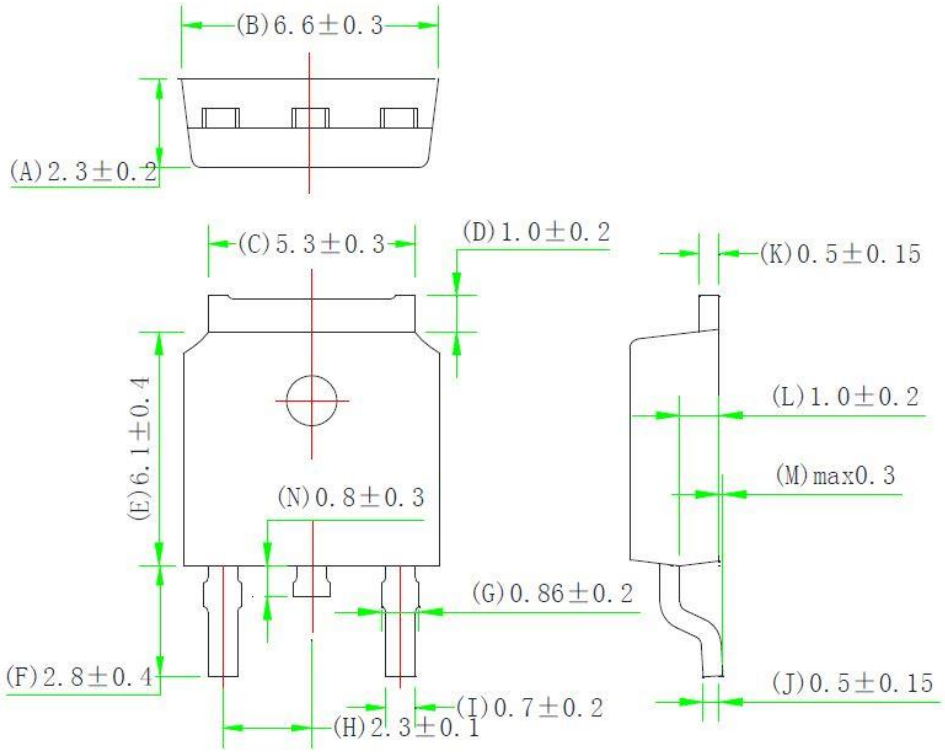

VDS
(DUT)
VF
VDD
Body Diode
Forwad Voltage Drop

Package Dimensions

TO-220F(unit : mm)



TO-252


(B)6.6±0.3
(A)2.3±0.2
(C)5.3±0.3
(D)1.0±0.2
(K)0.5±0.15
(E)6.1±0.4
(L)1.0±0.2
(M)max0.3
(N)0.8±0.3
(G)0.86±0.2
(F)2.8±0.4
(J)0.5±0.15
(I)0.7±0.2
(H)2.3±0.1

Revision History

No	Date	Contents
0	2021-04-25	Initial Brief Datasheet Release

http://www.apsemi.com

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