HAOLIN ELECTRONICS

Dec 2006

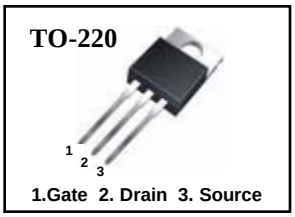
HP70N80

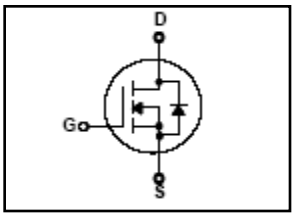
80V N -Channel MOSFET

BV_{DSS} = 80V

$R_{DS(on)\ typ}$ =0.011 Ω

I_D = 70 A





FEATURES

- Originative New Design
- Superior Avalanche Rugged Technology
- Robust Gate Oxide Technology
- Very Low Intrinsic Capacitances
- Excellent Switching Characteristics
- Unrivalled Gate Charge : 22 nC (Typ.)
- Extended Safe Operating Area
- Lower $R_{DS(ON)}$: 0.0110 Ω (Typ.) @V_{GS}=10V
- 100% Avalanche Tested

Absolute Maximum Ratings

T_C=25℃ unless otherwise specified

Symbol	Parameter		Value	Units
V_{DSS}	Drain-Source Voltage		80	V
I_D	Drain Current – Continuous (T_C = 25℃)		70	A
	Drain Current – Continuous (T_C = 100℃)		50A	A
I_{DM}	Drain Current – Pulsed	(Note 1)	280	A
V_{GS}	Gate-Source Voltage		±20	V
E_{AS}	Single Pulsed Avalanche Energy	(Note 2)	230	mJ
I_{AR}	Avalanche Current	(Note 1)	28	A
E_{AR}	Repetitive Avalanche Energy	(Note 1)	20	mJ
dv/dt	Peak Diode Recovery dv/dt	(Note 3)	5.8	V/ns
P_D	Power Dissipation (T_C = 25℃)		200	W
	– Derate above 25℃		1.3	W/℃
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃
T_L	Maximum lead temperature for soldering purposes, 1/8” from case for 5 seconds		300	℃

Thermal Resistance Characteristics

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	--	0.85	℃/W
$R_{\theta CS}$	Case-to-Sink	0.5	--	
$R_{\theta JA}$	Junction-to-Ambient	--	62.5	

80V_{DS}／±25V_{GS}／70A(I_D) N-Channel Enhancement Mode MOSFET

Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Symbol	Parameter		Typical	Unit
V_{DSS}	Drain-Source Voltage		80	V
V_{GSS}	Gate –Source Voltage		±25	V
I_D	Continuous Drain Current	T_C=100°C	50	A
		T_C=25°C	70	A
I_{DP}	300us Pulsed Drain Current Tested		280	A
I_S	Diode Continuous Forward Current		70	A
T_J	Operating Junction Temperature		175	°C
T_{STG}	Storage Temperature Range		-55 ~ 175	°C

Electrical Characteristics (TA=25°C Unless otherwise noted)

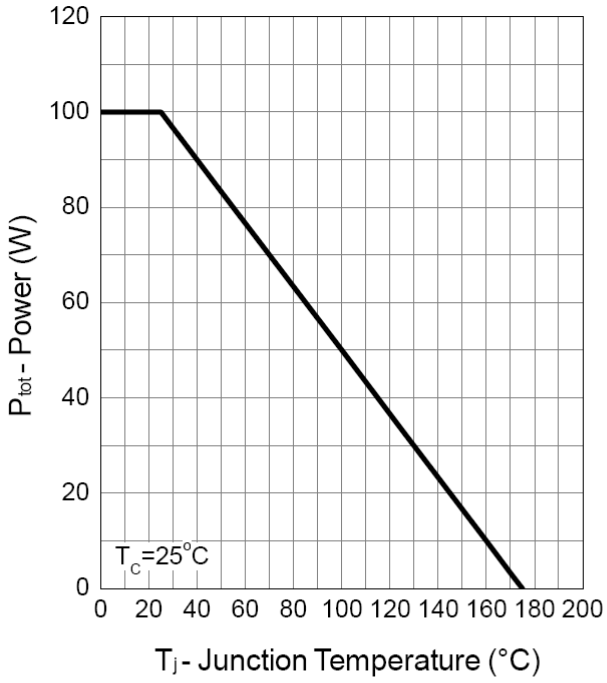
Symbol	Parameter	Test Conditions	Min.	Typ	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V,I_D=250uA	80			V
$\Delta BV_{DSS}/\Delta T_J$	Breakdown Voltage Temp. Coe			0.073		
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-24V,V_{GS}=0V			1	uA
		T_J=85°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250uA	2	3	4	V
I_{GSS}	Gate Leakage Current	V_{GS}=±25V, V_{DS}=0V			±100	nA
$R_{DS(on)}$[1]	Drain-Source On-Resistance	V_{GS}=10V, I_D=40A		8	11	mΩ
Diode Characteristics						
V_{SD}[1]	Diode Forward Voltage	I_{SD}=20A,V_{GS}=0V		0.8	1.3	V
t_{rr}	Reverse Recovery Time	I_{SD}=40A,		50		ns
Q_{rr}	Reverse Recovery Charge	dI_{SD}/dt=100A/us		90		nC
Dynamic Characteristics[2]						
R_G	Gate Resistance	V_{GS}=0V, V_{DS}=0V, Frequency=1MHz		1.3		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=30V Frequency=1MHz		3000	4200	pF
C_{oss}	Output Capacitance			350		
C_{rss}	Reverse Transfer Capacitance			250		
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=30V,R_L=30Ω I_D=1A,V_{GEN}=10V R_G=6Ω		22	40	ns
t_r	Turn-On Rise Time			14	25	
$t_{d(off)}$	Turn-Off Delay Time			58	104	
t_f	Turn-Off Fall Time			25	45	
Gate Charge Characteristics[2]						
Q_g	Total Gate Charge	V_{DS}=40V,V_{GS}=10V I_D=40A		77	108	nC
Q_{gs}	Gate-Source Charge			22		
Q_{gd}	Gate-Drain Charge			23		

Note: 1: Pulse test ; pulse width ≦ 300ns, duty cycle ≦ 2%.

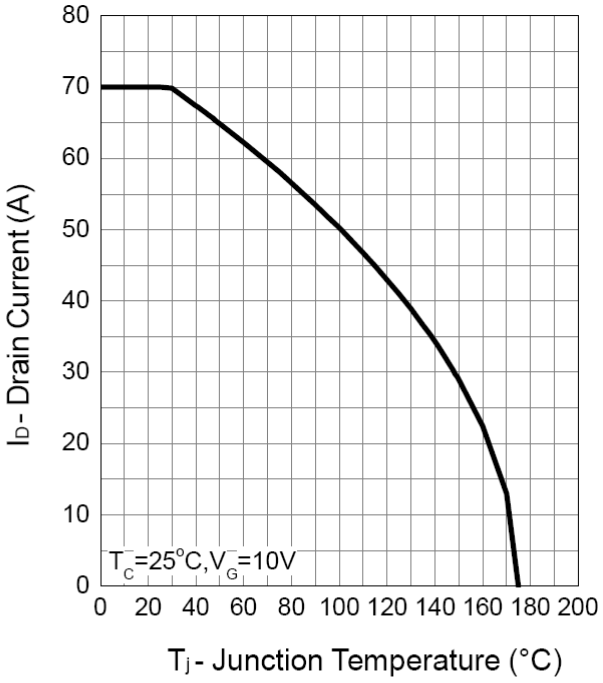
2: Guaranteed by design, not subject to production testing.

Typical Characteristics

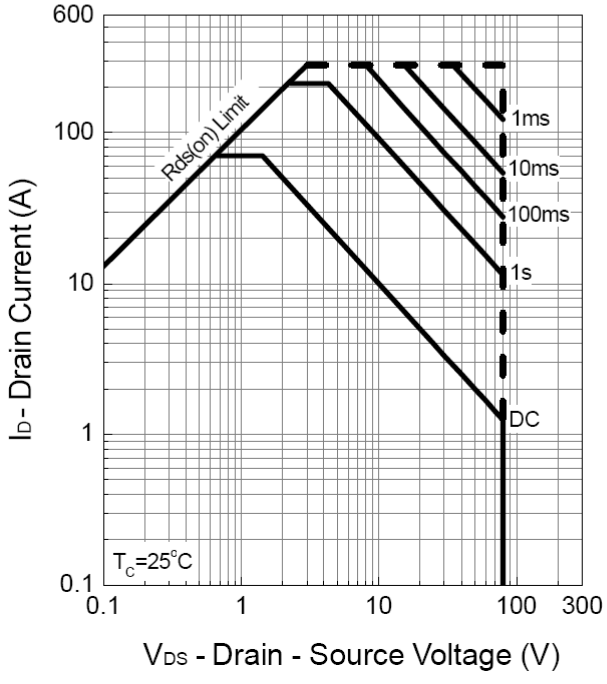
Power Dissipation



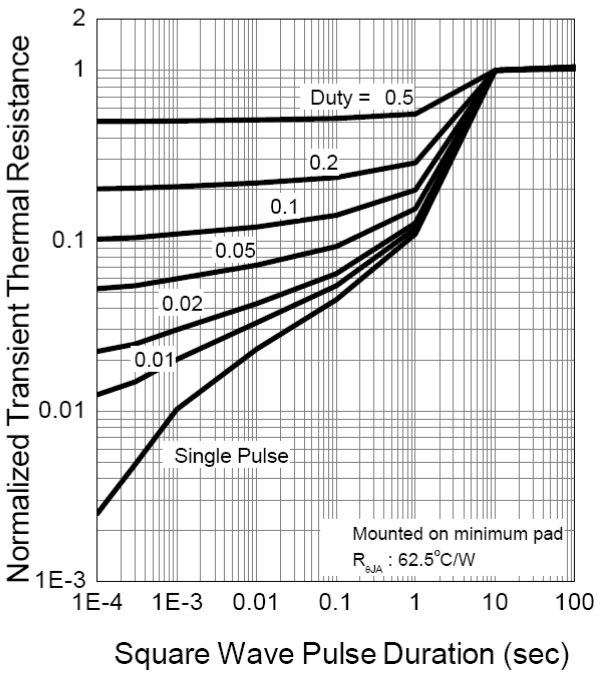
Drain Current



Safe Operation Area

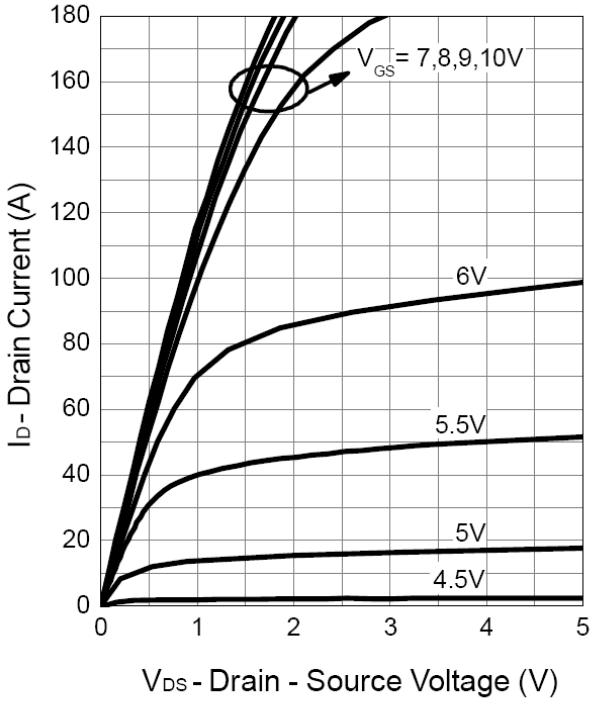


Thermal Transient Impedance

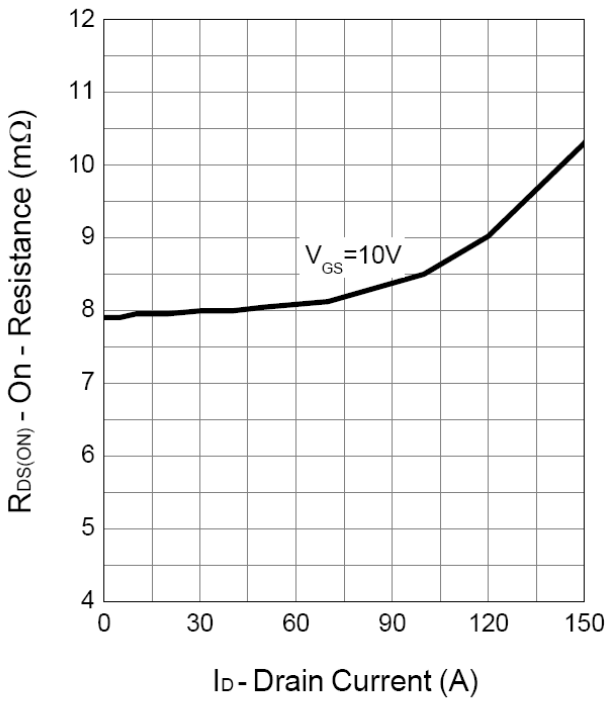


Typical Characteristics (Cont.)

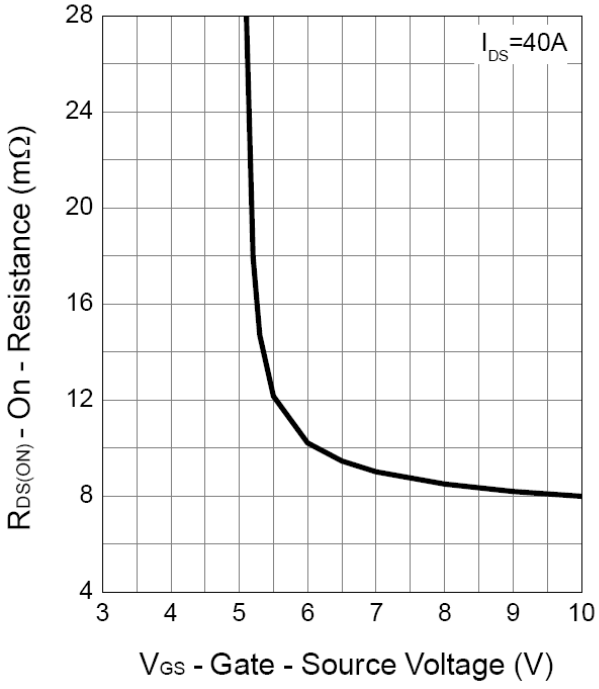
Output Characteristics



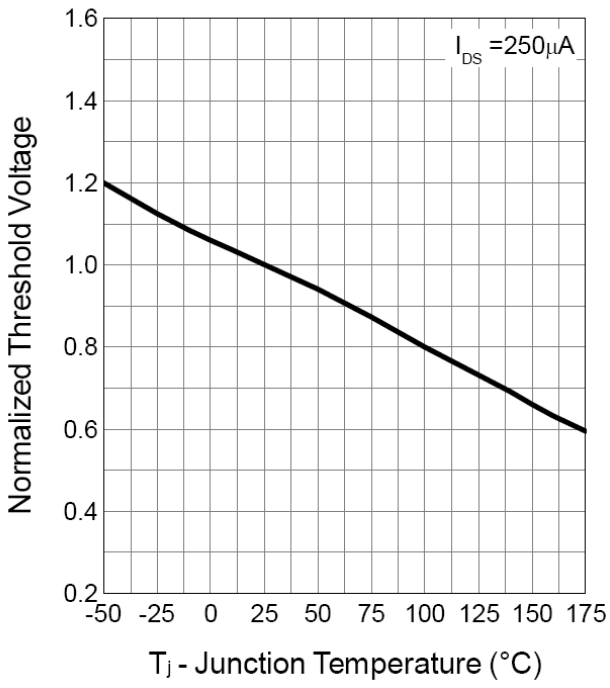
Drain-Source On Resistance



Gate-Source On Resistance

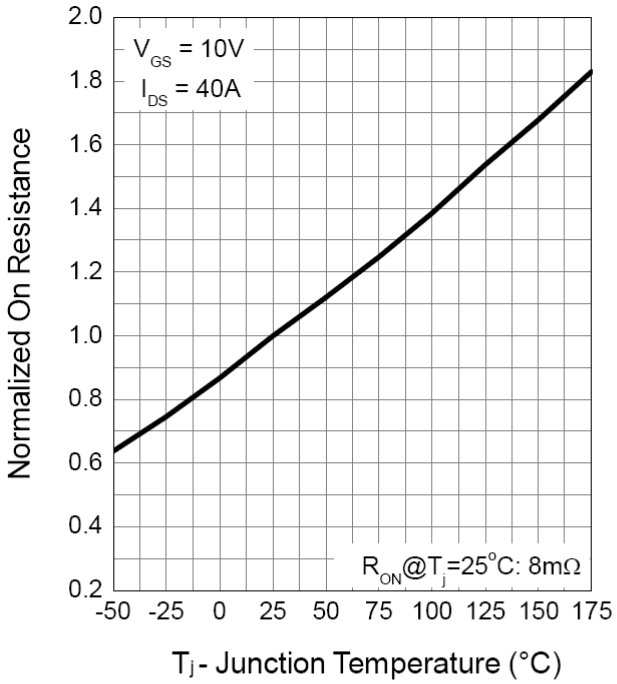


Gate Threshold Voltage

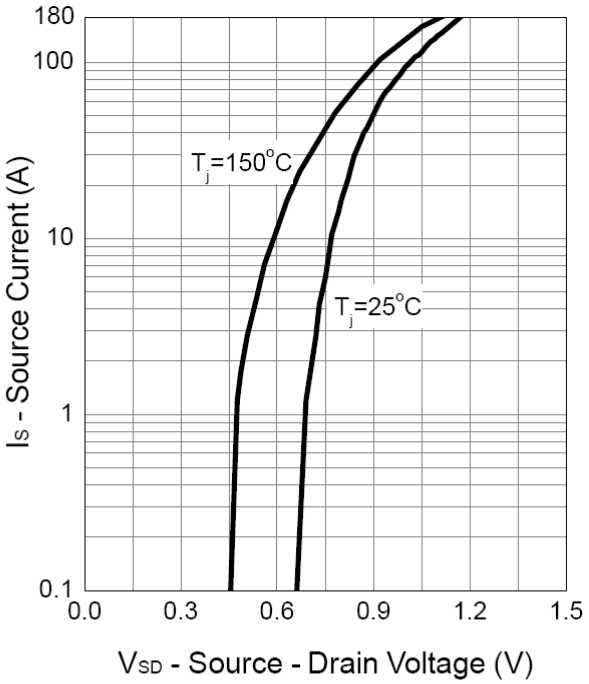


Typical Characteristics (Cont.)

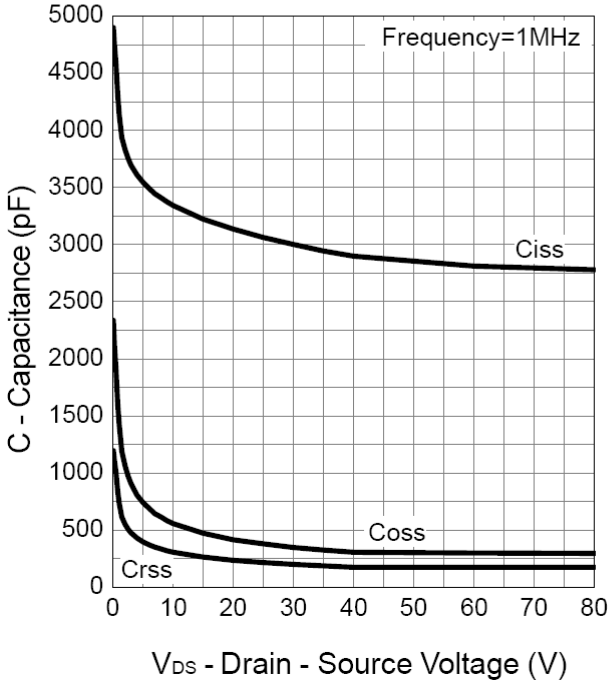
Drain-Source On Resistance



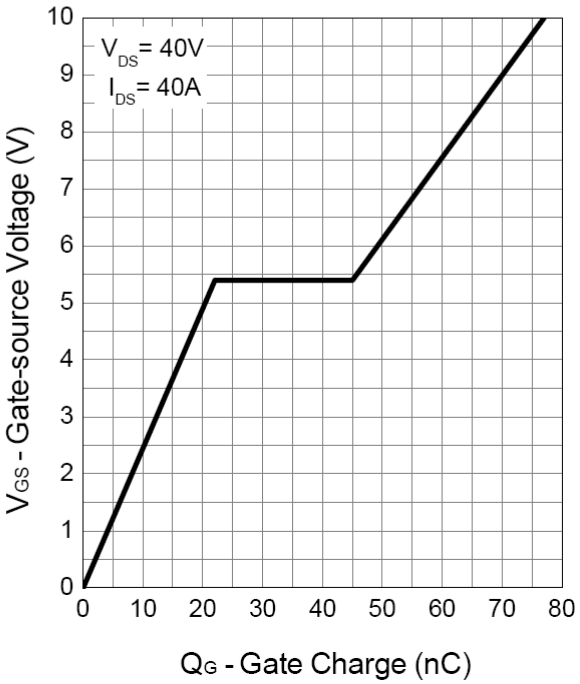
Source-Drain Diode Forward



Capacitance

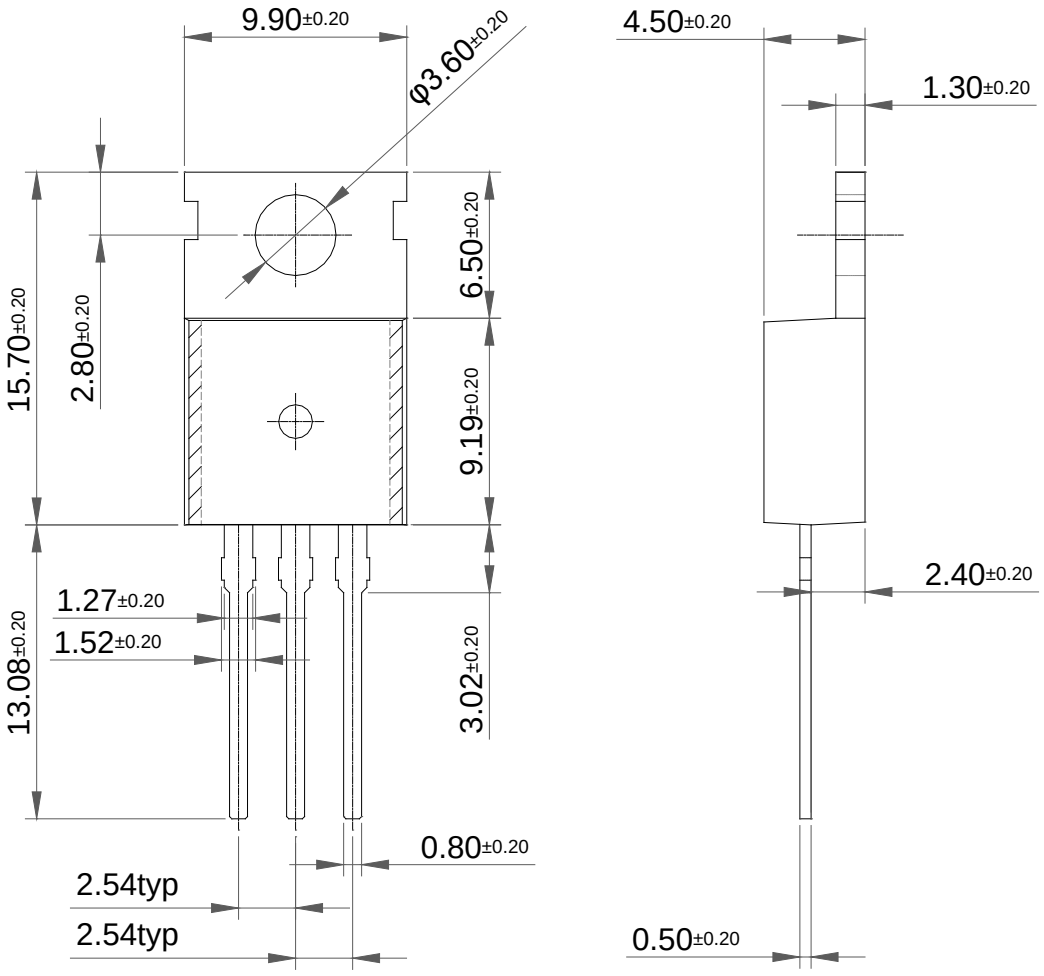


Gate Charge

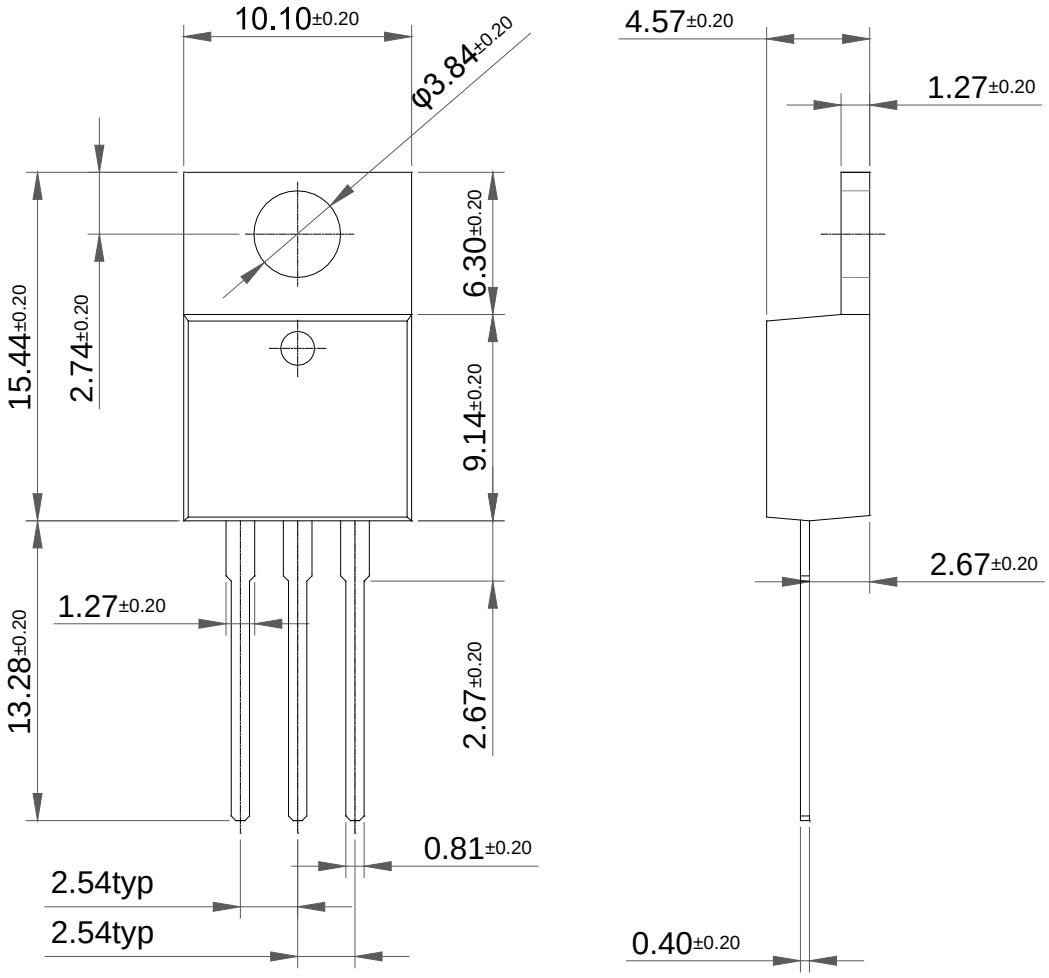


Package Dimension

TO-220 (A)



TO-220 (B)


10.10±0.20
φ3.84±0.20
15.44±0.20
2.74±0.20
6.30±0.20
9.14±0.20
13.28±0.20
1.27±0.20
2.67±0.20
0.81±0.20
2.54typ
2.54typ
4.57±0.20
1.27±0.20
2.67±0.20
0.40±0.20