

# HP70N80

## 80V N -Channel MOSFET

### 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  $\Omega$  (Typ.) @  $V_{GS}=10V$
- ❑ 100% Avalanche Tested

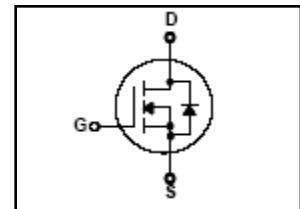
$$BV_{DSS} = 80V$$

$$R_{DS(on) \text{ typ}} = 0.011 \Omega$$

$$I_D = 70 A$$

**TO-220**


1.Gate 2. Drain 3. Source



### Absolute Maximum Ratings $T_C=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Value	Units
$V_{DSS}$	Drain-Source Voltage	80	V
$I_D$	Drain Current – Continuous ( $T_C = 25^\circ\text{C}$ )	70	A
	Drain Current – Continuous ( $T_C = 100^\circ\text{C}$ )	50A	A
$I_{DM}$	Drain Current – Pulsed (Note 1)	280	A
$V_{GS}$	Gate-Source Voltage	$\pm 20$	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 ( $T_C = 25^\circ\text{C}$ ) – Derate above $25^\circ\text{C}$	200	W
		1.3	W/ $^\circ\text{C}$
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
$T_L$	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	$^\circ\text{C}$

### Thermal Resistance Characteristics

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

**80V<sub>DS</sub>/±25V<sub>GS</sub>/70A(I<sub>D</sub>) N-Channel Enhancement Mode MOSFET****Absolute Maximum Ratings** (T<sub>A</sub>=25°C unless otherwise noted)

Symbol	Parameter	Typical	Unit	
V <sub>DSS</sub>	Drain-Source Voltage	80	V	
V <sub>GSS</sub>	Gate –Source Voltage	±25	V	
I <sub>D</sub>	Continuous Drain Current	T <sub>C</sub> =100°C	50	A
			70	A
I <sub>DP</sub>	300us Pulsed Drain Current Tested	280	A	
I <sub>S</sub>	Diode Continuous Forward Current	70	A	
T <sub>J</sub>	Operating Junction Temperature	175	°C	
T <sub>STG</sub>	Storage Temperature Range	-55 ~ 175	°C	

**Electrical Characteristics** (T<sub>A</sub>=25°C Unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ	Max.	Unit
<b>Static Characteristics</b>						
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	80			V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Breakdown Voltage Temp. Coe			0.073		
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			1	uA
					30	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	2	3	4	V
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =±25V, V <sub>DS</sub> =0V			±100	nA
R <sub>DS(on)</sub> <sup>1</sup>	Drain-Source On-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =40A		8	11	mΩ
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>1</sup>	Diode Forward Voltage	I <sub>SD</sub> =20A, V <sub>GS</sub> =0V		0.8	1.3	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> =40A,		50		ns
Q <sub>rr</sub>	Reverse Recovery Charge	dI <sub>SD</sub> /dt=100A/us		90		nC
<b>Dynamic Characteristics<sup>2</sup></b>						
R <sub>G</sub>	Gate Resistance	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, Frequency=1MHz		1.3		Ω
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> =30V Frequency=1MHz		3000	4200	pF
C <sub>oss</sub>	Output Capacitance			350		
C <sub>rss</sub>	Reverse Transfer Capacitance			250		
t <sub>d(on)</sub>	Turn-On Delay Time	V <sub>DD</sub> =30V, R <sub>L</sub> =30Ω I <sub>D</sub> =1A, V <sub>GEN</sub> =10V R <sub>G</sub> =6Ω		22	40	ns
t <sub>r</sub>	Turn-On Rise Time			14	25	
t <sub>d(off)</sub>	Turn-Off Delay Time			58	104	
t <sub>f</sub>	Turn-Off Fall Time			25	45	
<b>Gate Charge Characteristics<sup>2</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =40V, V <sub>GS</sub> =10V I <sub>D</sub> =40A		77	108	nC
Q <sub>gs</sub>	Gate-Source Charge			22		
Q <sub>gd</sub>	Gate-Drain Charge			23		

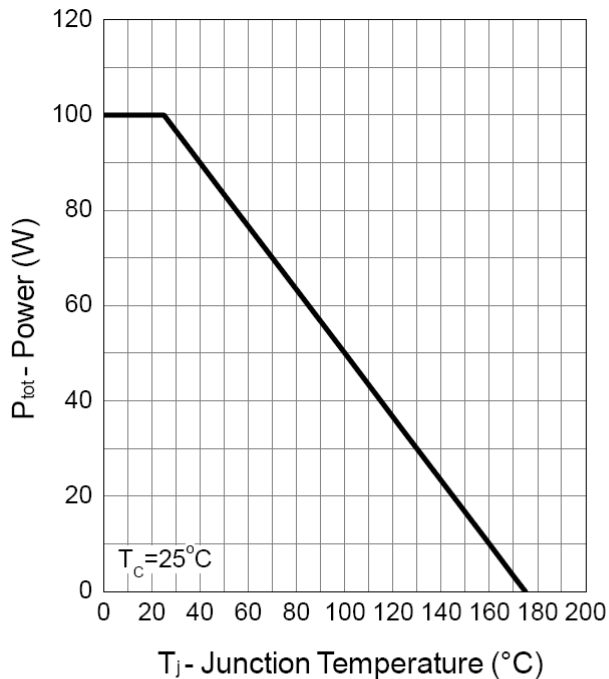
Note: 1: Pulse test ; pulse width ≤ 300ns, duty cycle ≤ 2%.

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

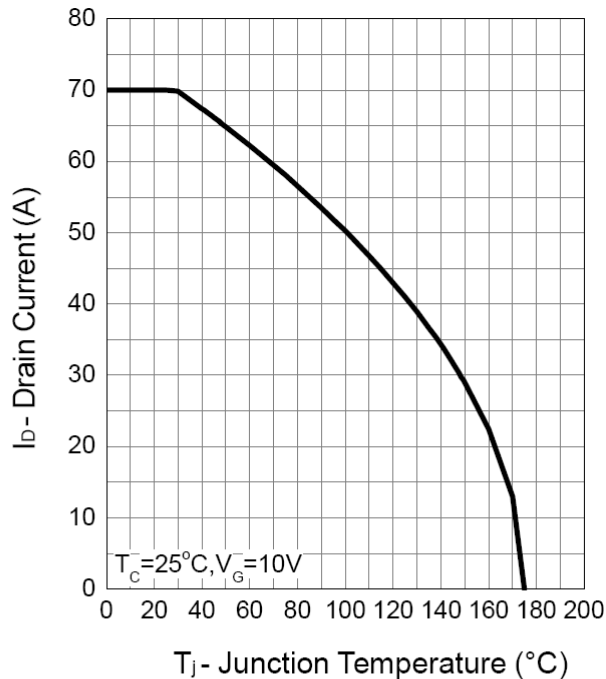
80V<sub>DS</sub>/±25V<sub>GS</sub>/70A(I<sub>D</sub>) N-Channel Enhancement Mode MOSFET

Typical Characteristics

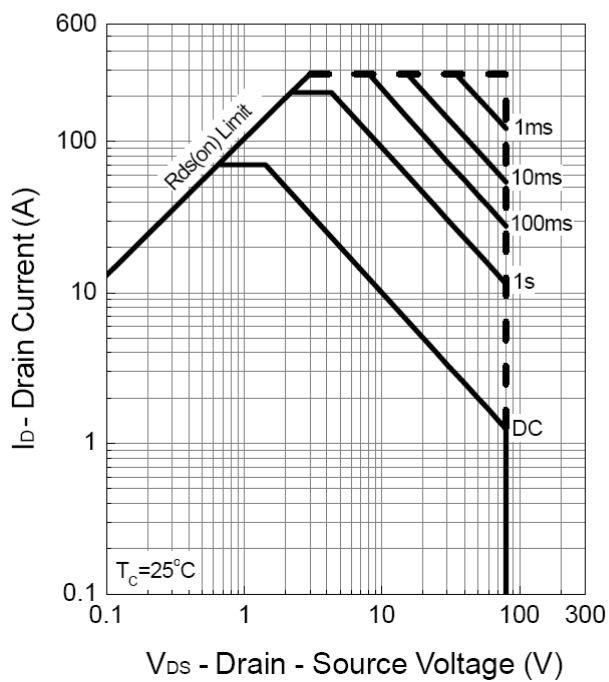
Power Dissipation



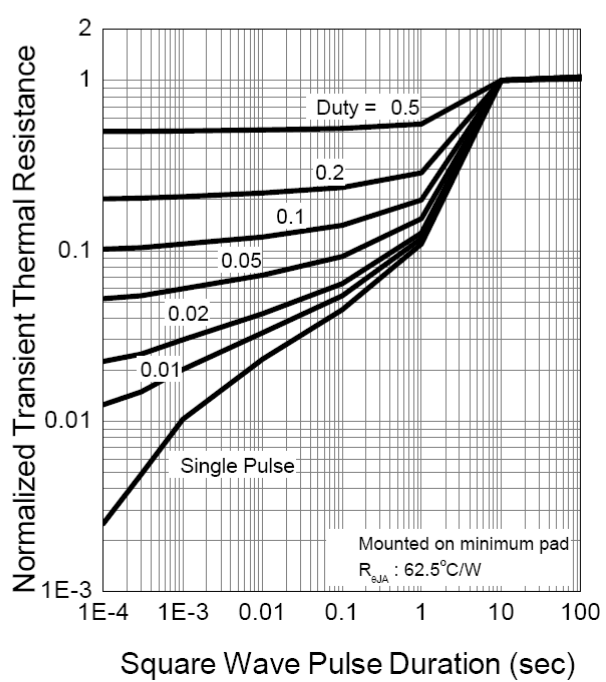
Drain Current



Safe Operation Area

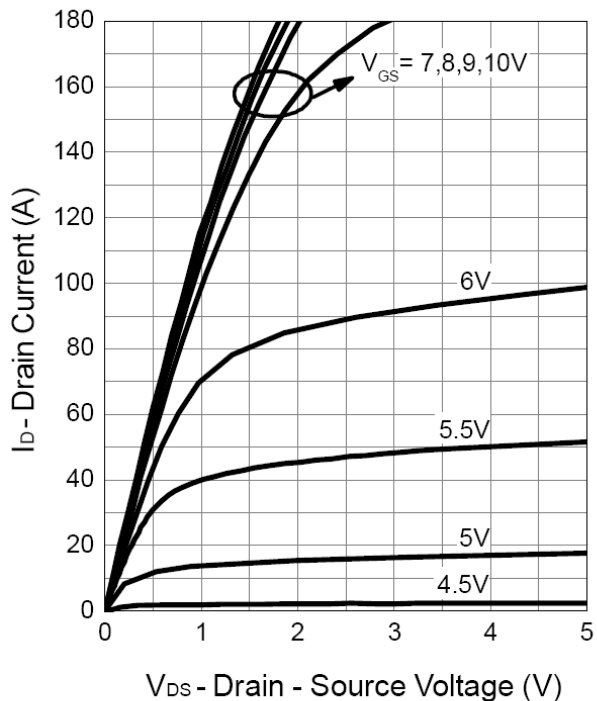


Thermal Transient Impedance

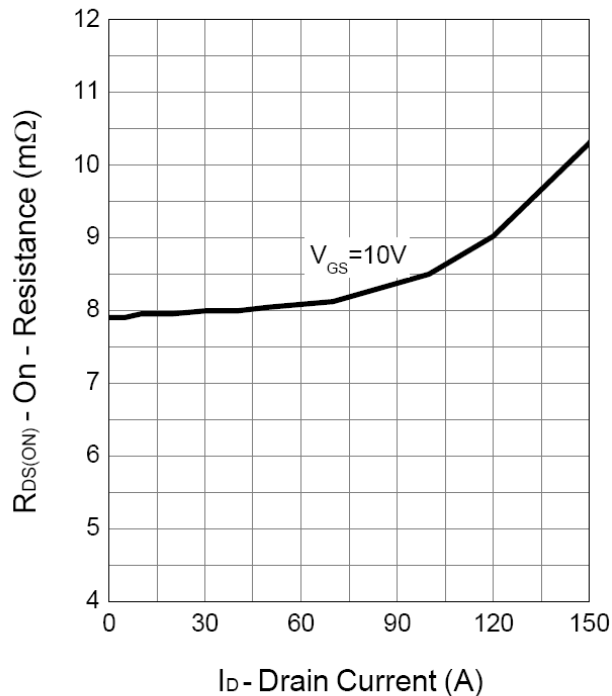


Typical Characteristics (Cont.)

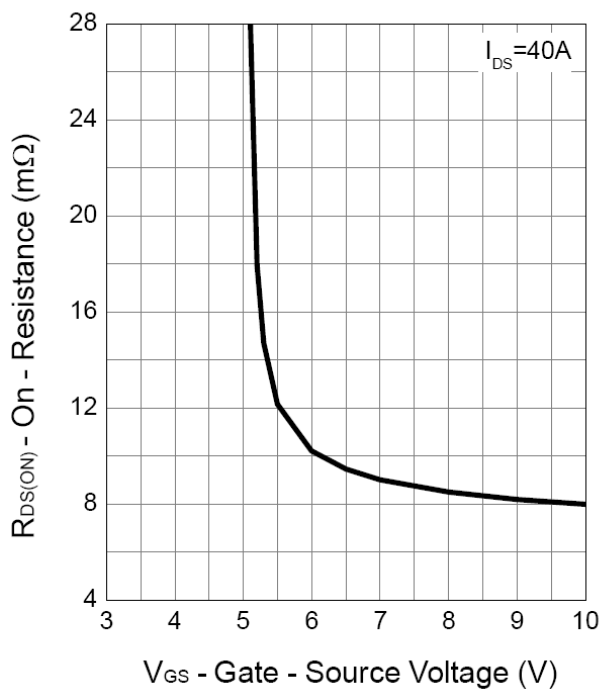
Output Characteristics



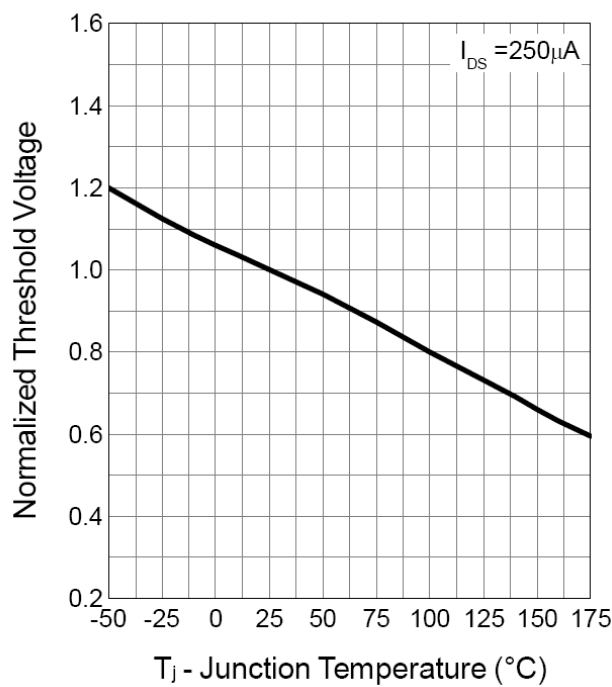
Drain-Source On Resistance



Gate-Source On Resistance

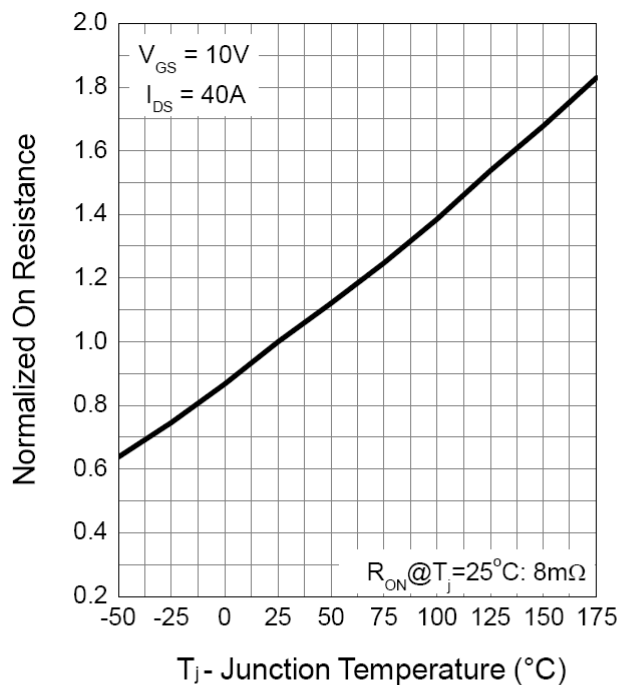


Gate Threshold Voltage

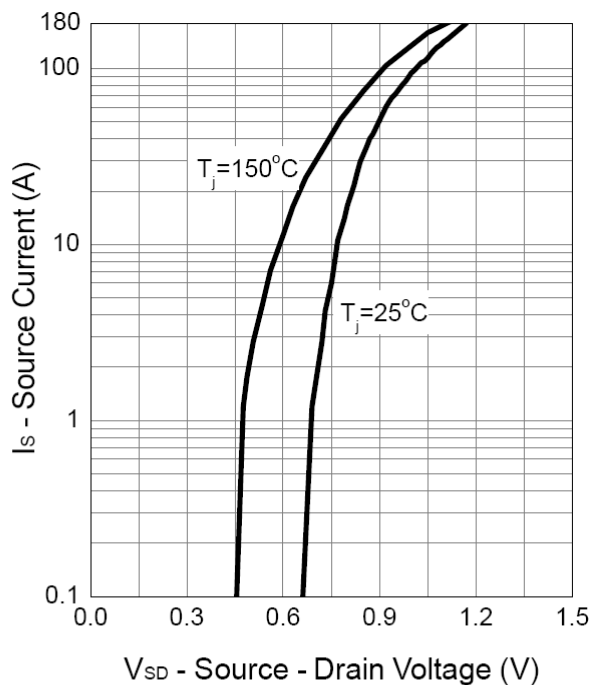


Typical Characteristics (Cont.)

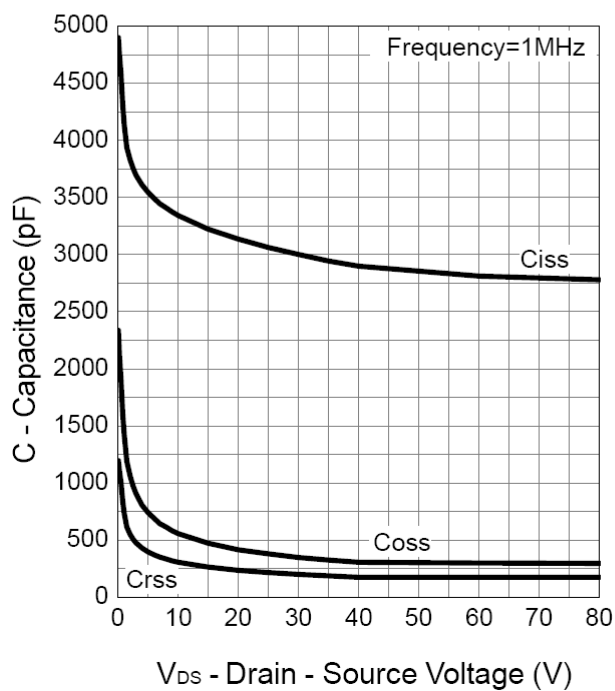
Drain-Source On Resistance



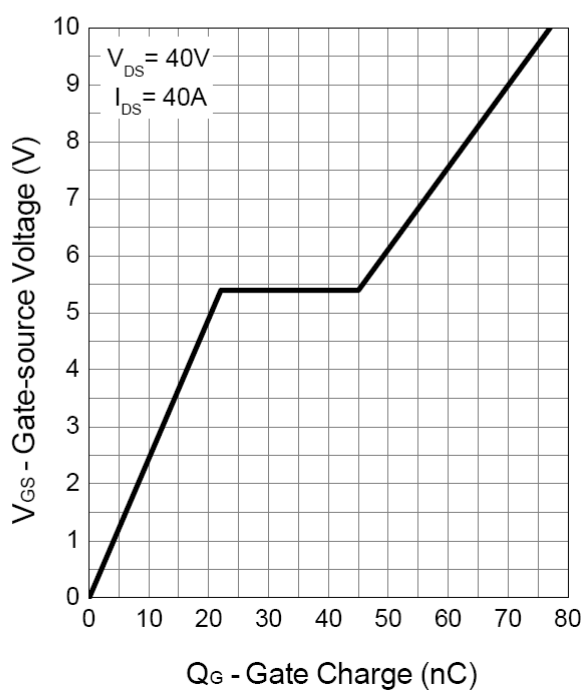
Source-Drain Diode Forward



Capacitance

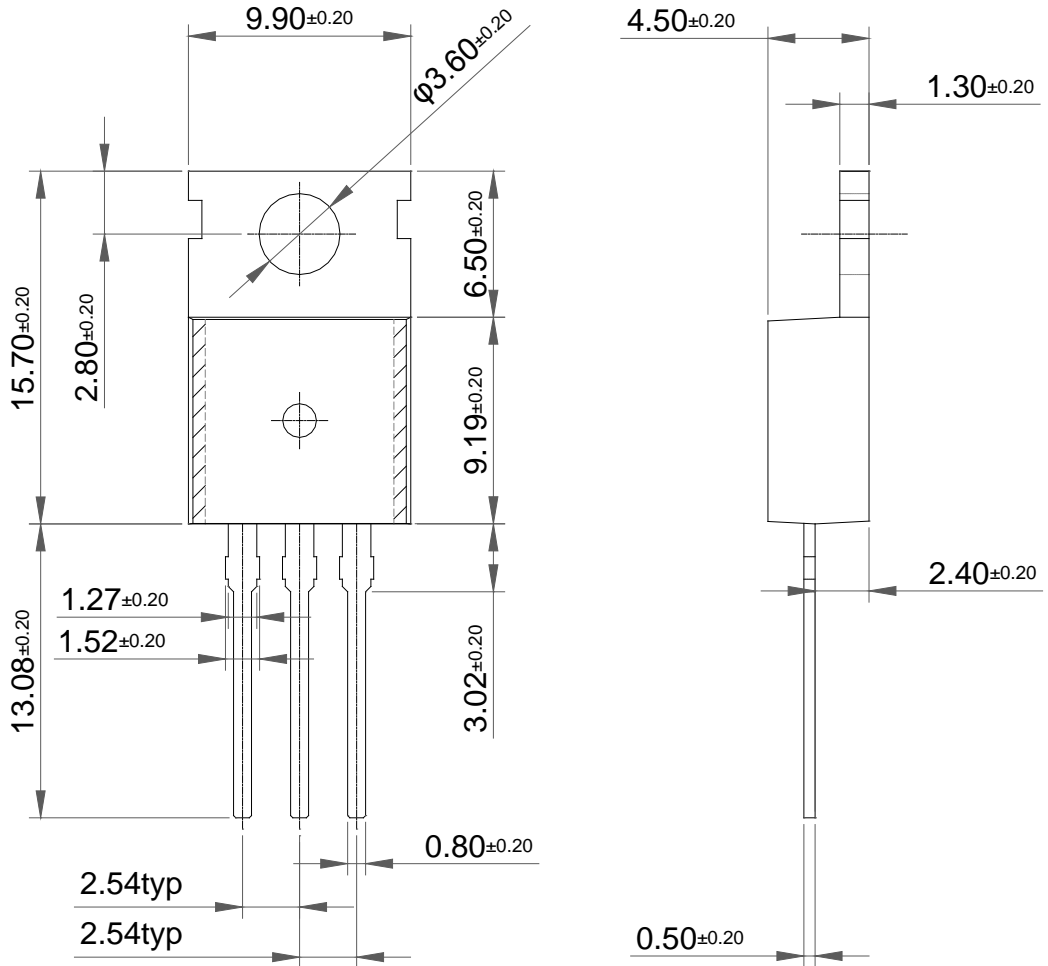


Gate Charge

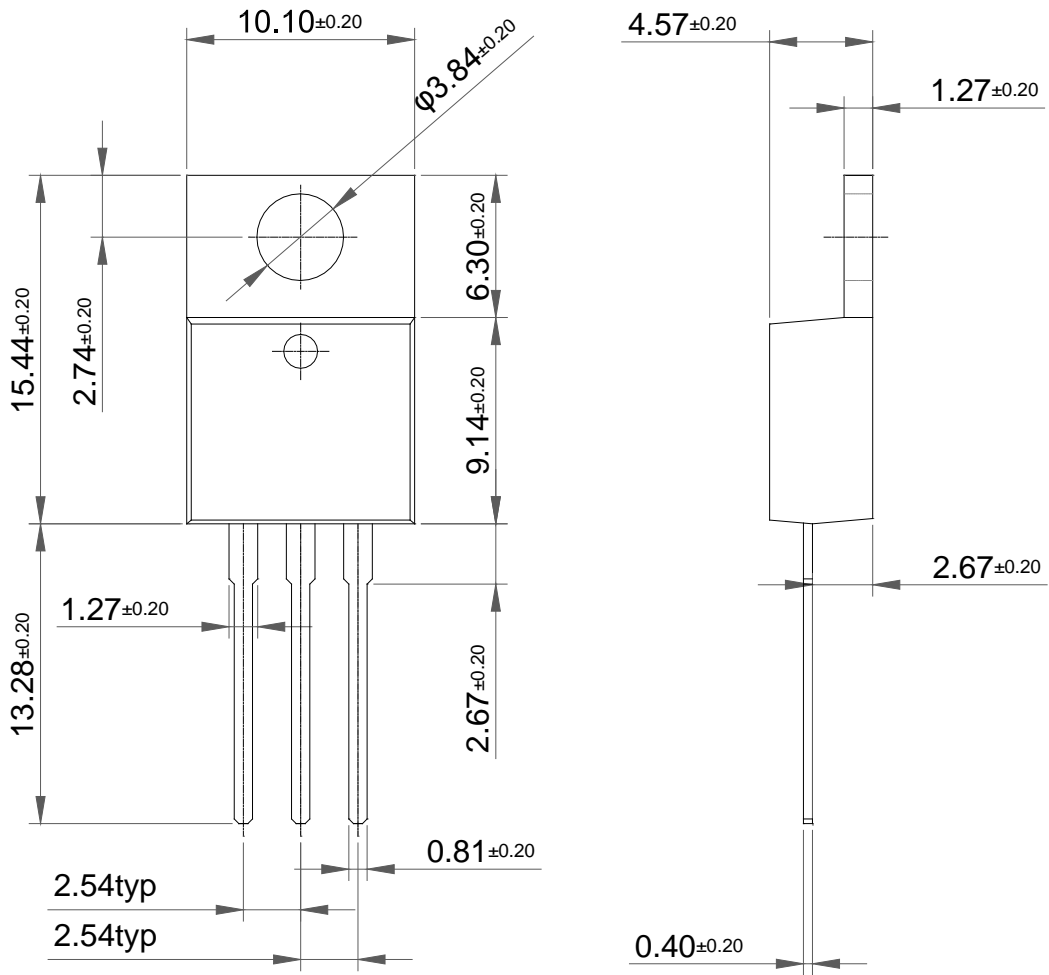


Package Dimension

TO-220 (A)



# TO-220 (B)



## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [MOSFET](#) category:*

*Click to view products by [Haolin](#) manufacturer:*

Other Similar products are found below :

[IRFD120](#) [IRFY240C](#) [JANTX2N5237](#) [BUK455-60A/B](#) [MIC4420CM-TR](#) [VN1206L](#) [NDP4060](#) [SI4482DY](#) [IPS70R2K0CEAKMA1](#)  
[SQD23N06-31L-GE3](#) [TK16J60W,S1VQ\(O](#) [2SK2614\(TE16L1,Q\)](#) [DMN1017UCP3-7](#) [EFC2J004NUZTDG](#) [DMN1053UCP4-7](#) [SQJ469EP-](#)  
[T1-GE3](#) [NTE2384](#) [DMC2700UDMQ-7](#) [DMN2080UCB4-7](#) [DMN61D9UWQ-13](#) [US6M2GTR](#) [DMN31D5UDJ-7](#) [DMP22D4UFO-7B](#)  
[DMN1006UCA6-7](#) [DMN16M9UCA6-7](#) [STF5N65M6](#) [IRF40H233XTMA1](#) [STU5N65M6](#) [DMN6022SSD-13](#) [DMN13M9UCA6-7](#)  
[DMTH10H4M6SPS-13](#) [DMN2990UFB-7B](#) [IPB80P04P405ATMA2](#) [2N7002W-G](#) [MCAC30N06Y-TP](#) [MCQ7328-TP](#) [NTMC083NP10M5L](#)  
[NVMFS2D3P04M8LT1G](#) [BXP7N65D](#) [BXP4N65F](#) [AOL1454G](#) [WMJ80N60C4](#) [BXP2N20L](#) [BXP2N65D](#) [BXT1150N10J](#) [BXT1700P06M](#)  
[TSM60NB380CP](#) [ROG](#) [RQ7L055BGTCR](#) [DMNH15H110SK3-13](#) [SLF10N65ABV2](#)