

# FH3008PS

## N-Channel Enhancement Mode MOSFET

### Description

The FH3008PS uses deep trench technology to provide excellent  $R_{DS(ON)}$  and low gate charge. It can be used in a wide variety of applications.

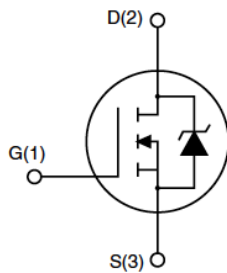
- High Power and current handing capability
- Lead free product is acquired
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### General Features

- $V_{DS} = 85V, I_D = 100A$
- $R_{DS(ON)}$  (Typ) :  $6.0 m\Omega @ V_{GS} = 10V$

### Application

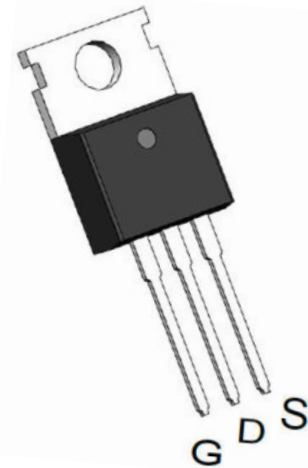
- PWM applications
- Load switch
- Power management



Schematic diagram



Marking and pin assignment



TO-220 top view

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	85	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	100	A
Drain Current-Continuous ( $T_C=100^\circ C$ )	$I_D(T_C=100^\circ C)$	78	A
Pulsed Drain Current (Note 1)	$I_{DM}$	320	A
Maximum Power Dissipation	$P_D$	167	W
Avalanche Energy (L=0.5mH)	$E_{AS}$	504	mJ
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 175	$^\circ C$

### Thermal Characteristic

Thermal Resistance, Junction-to-Case (Note 2)	$R_{\theta JC}$	0.9	$^\circ C/W$
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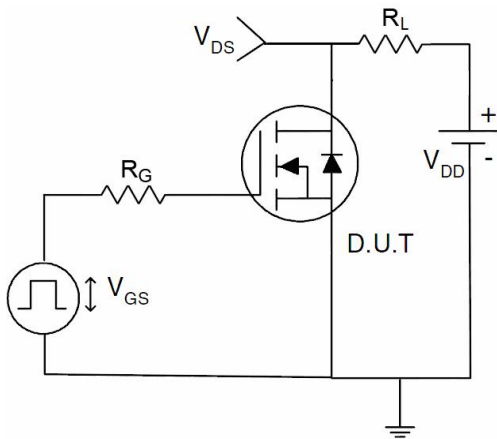
## Electrical Characteristics (TC=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	85	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=80V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b> (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.4	3.0	3.8	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=40A$	-	6	7	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=5V, I_D=40A$	-	70	-	S
<b>Dynamic Characteristics</b> (Note 4)						
Input Capacitance	$C_{iss}$	$V_{DS}=42.5V, V_{GS}=0V,$ $F=1.0MHz$	-	2890	-	pF
Output Capacitance	$C_{oss}$		-	540	-	pF
Reverse Transfer Capacitance (Note 4)	$C_{rss}$		-	22	-	pF
Gate Resistance	$R_g$	$V_{DS}=0V, V_{GS}=0V, F=1.0MHz$	-	1.6	-	$\Omega$
<b>Switching Characteristics</b>						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=40V, I_D=10A, R_L=1\Omega,$ $V_{GS}=10V, R_G=3\Omega$	-	14	-	nS
Turn-on Rise Time	$t_r$		-	11	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	36	-	nS
Turn-Off Fall Time	$t_f$		-	11	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=40V, I_D=20A, V_{GS}=10V$	-	44	-	nC
Gate-Source Charge	$Q_{gs}$		-	12	-	nC
Gate-Drain Charge	$Q_{gd}$		-	9	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=10A$	-	-	1.2	V
Diode Forward Current (Note 2)	$I_S$		-	-	100	A

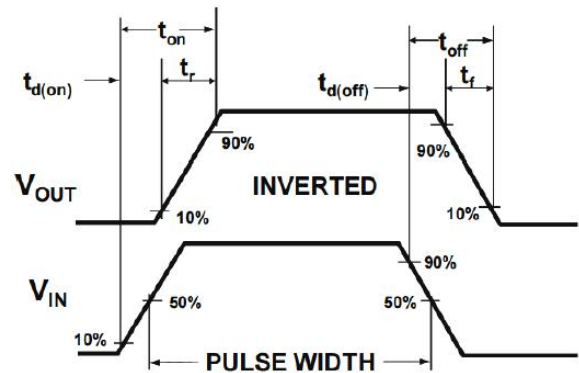
**Notes:**

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to product.

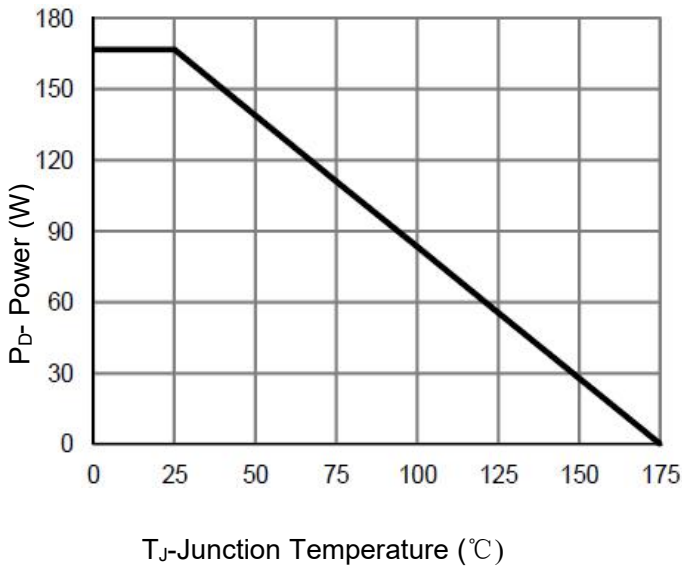
## Typical Electrical and Thermal Characteristics



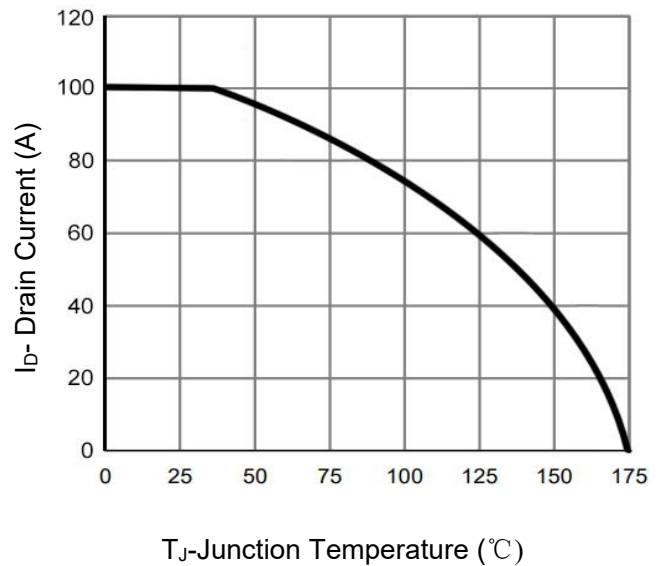
**Figure 1 Switching Test Circuit**



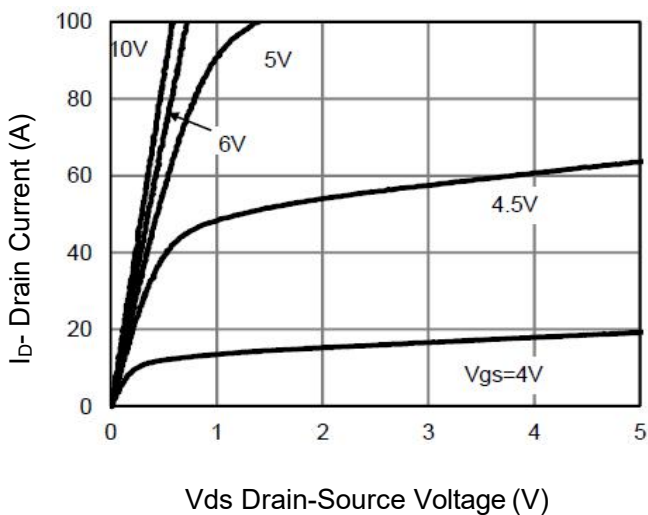
**Figure 2 Switching Waveform**



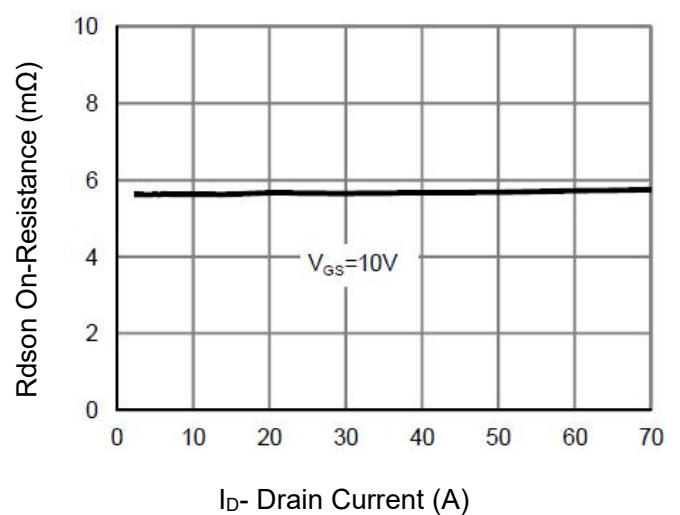
**Figure 3 Power De-rating**



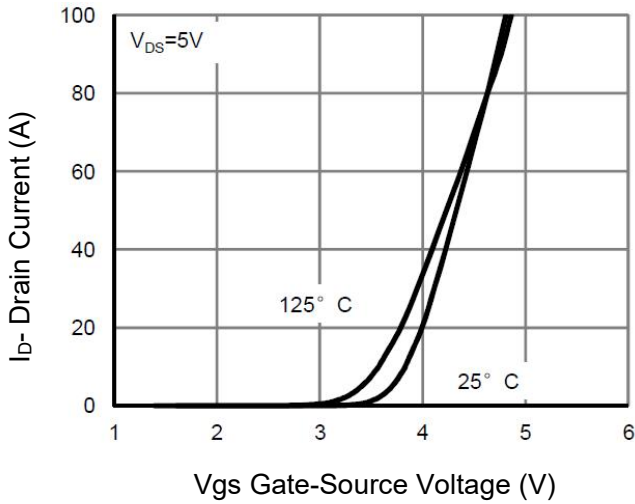
**Figure 4 Drain Current**



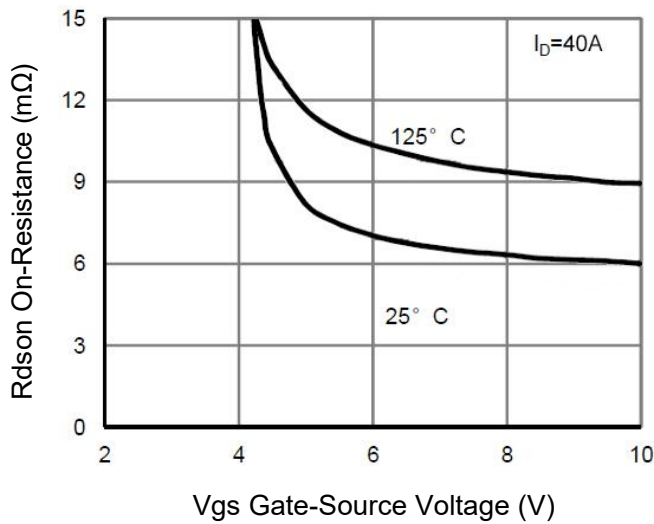
**Figure 5 Output Characteristics**



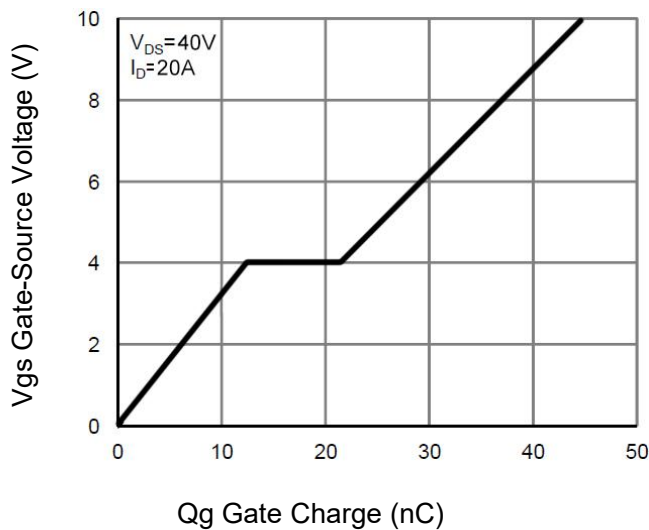
**Figure 6 Rdson vs Drain Current**



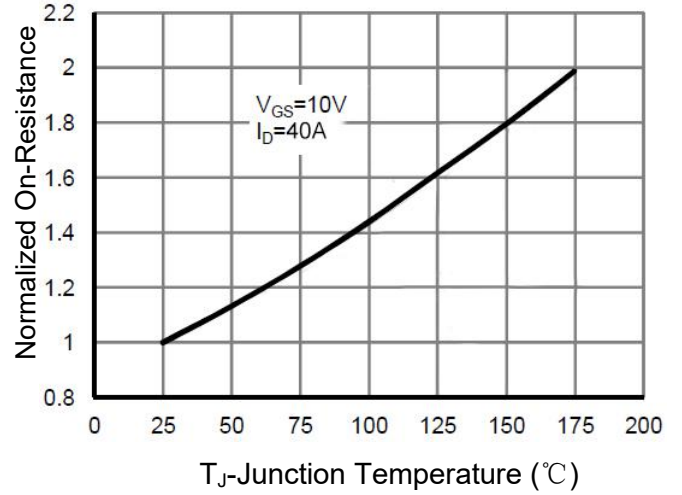
**Figure 7 Transfer Characteristics**



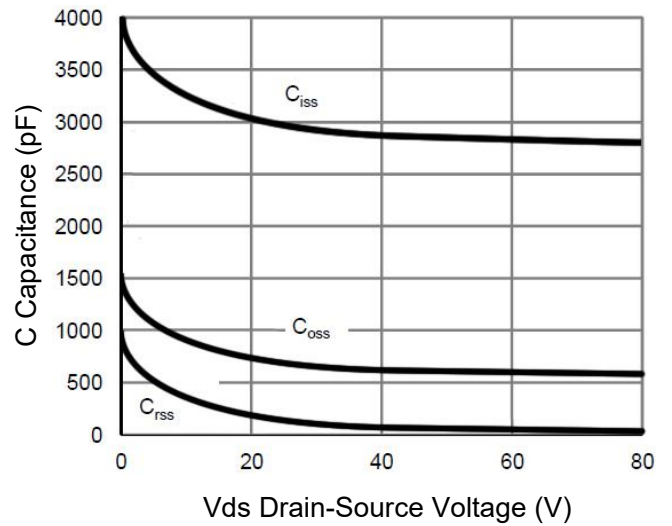
**Figure 9 Rdson vs Vgs**



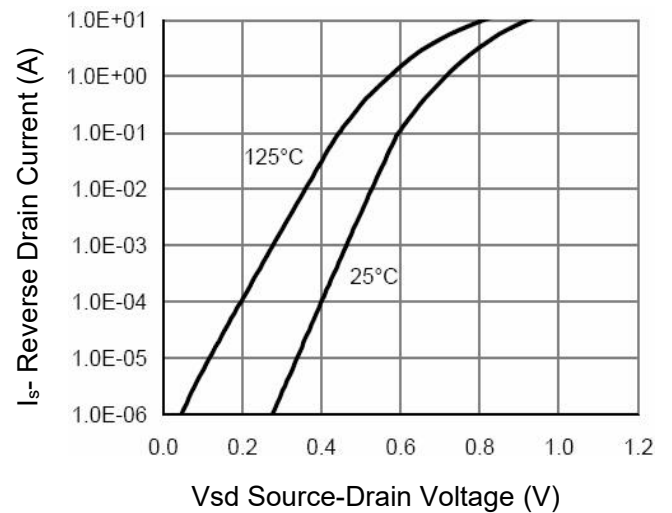
**Figure 11 Gate Charge**



**Figure 8 Rdson vs Junction Temperature**



**Figure 10 Capacitance vs Vds**



**Figure 12 Source- Drain Diode Forward**

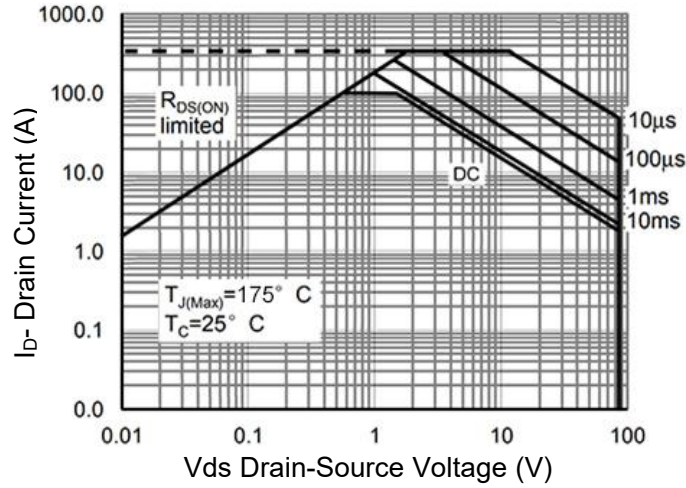


Figure 13 Safe Operation Area

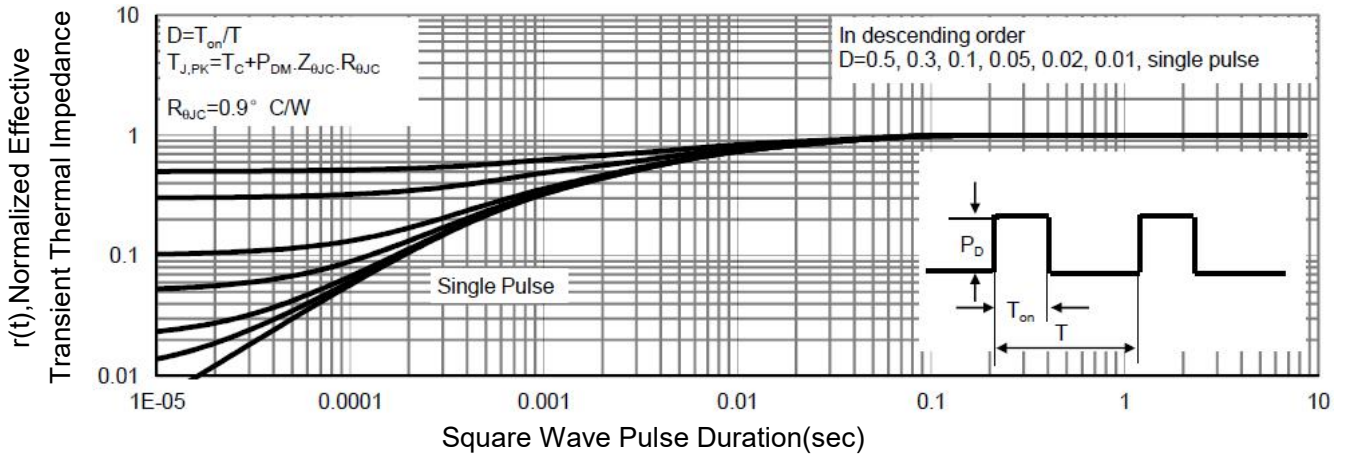
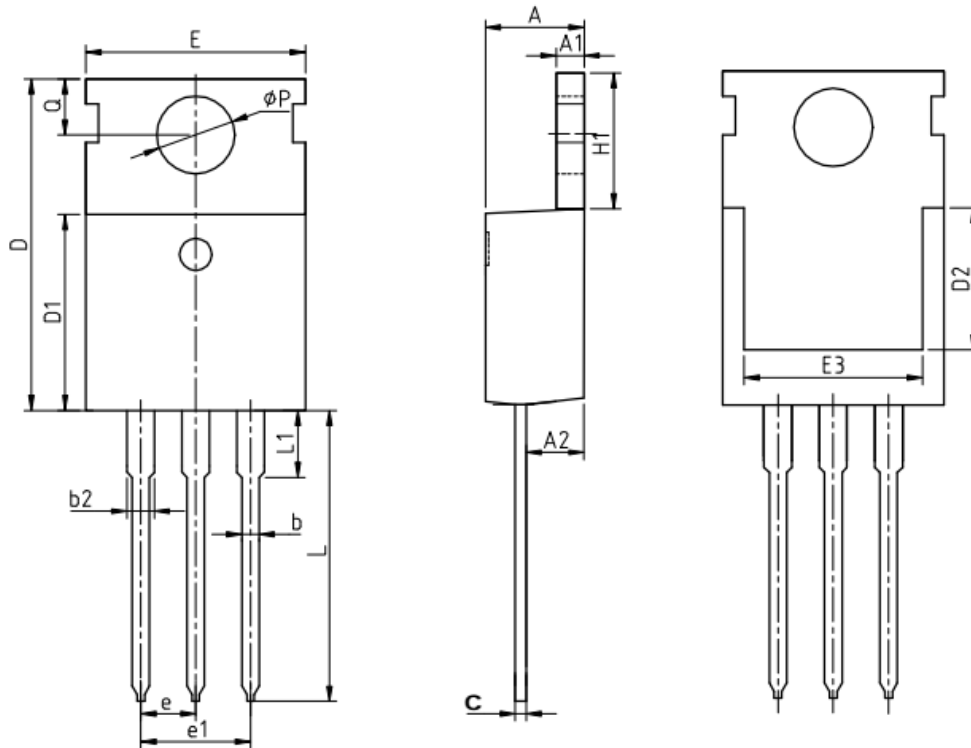


Figure 14 Normalized Maximum Transient Thermal Impedance

## Package Information : TO-220



COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.15	1.30	1.45
A2	2.20	2.40	2.60
b	0.70	0.80	0.95
b2	1.17	1.27	1.47
c	0.40	0.50	0.65
D	15.10	15.60	16.10
D1	8.80	9.10	9.40
D2	5.50	-	-
E	9.70	10.00	10.30
E3	7.00	-	-
e	2.54 BSC		
e1	5.08 BSC		
H1	6.25	6.50	6.85
L	12.75	13.50	13.80
L1	-	3.10	3.40
ΦP	3.40	3.60	3.80
Q	2.60	2.80	3.00