

### SWITCHING REGULATOR APPLICATIONS

#### Features

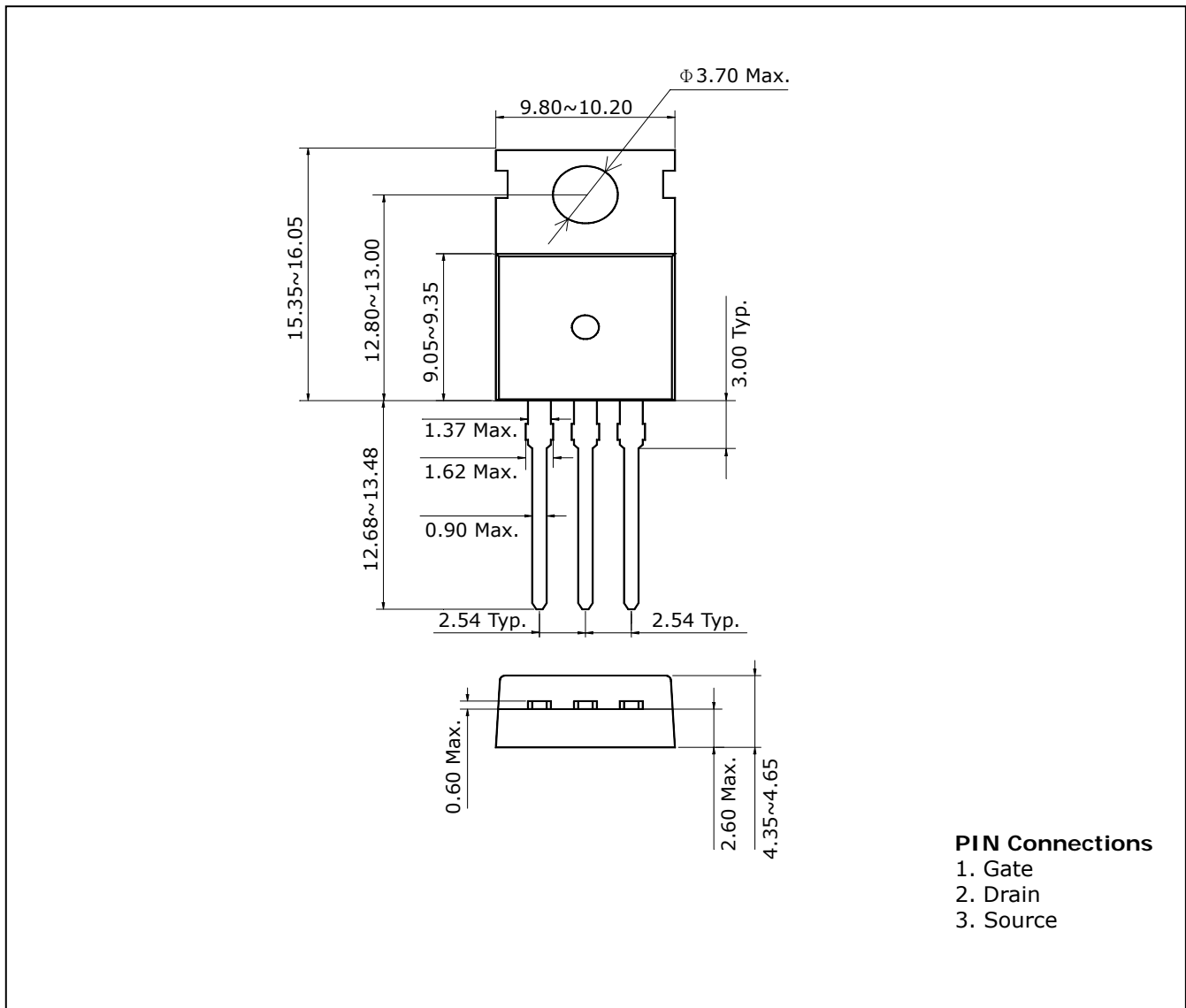
- High Voltage:  $BV_{DSS}=800V(\text{Min.})$
- Low  $C_{rSS}$  :  $C_{rSS}=5.0F(\text{Typ.})$
- Low gate charge :  $Qg=18nC(\text{Typ.})$
- Low  $R_{DS(on)}$  :  $R_{DS(on)}=4.8\Omega(\text{Max.})$

#### Ordering Information

Type NO.	Marking	Package Code
STK0380P	STK0380	TO-220AB-3L

#### Outline Dimensions

**unit : mm**



- PIN Connections**
1. Gate
  2. Drain
  3. Source

### Absolute maximum ratings

(T<sub>c</sub>=25°C)

Characteristic	Symbol	Rating	Unit	
Drain-source voltage	V <sub>DSS</sub>	800	V	
Gate-source voltage	V <sub>GSS</sub>	±30	V	
Drain current (DC)	I <sub>D</sub>	T <sub>C</sub> =25°C	3.0	A
		T <sub>C</sub> =100°C	1.9	A
Drain current (Pulsed) *	I <sub>DM</sub>	12	A	
Drain power dissipation	P <sub>D</sub>	107	W	
Avalanche current (Single) ②	I <sub>AS</sub>	3	A	
Single pulsed avalanche energy ②	E <sub>AS</sub>	320	mJ	
Avalanche current (Repetitive) ①	I <sub>AR</sub>	12	A	
Repetitive avalanche energy ①	E <sub>AR</sub>	10.7	mJ	
Junction temperature	T <sub>J</sub>	150	°C	
Storage temperature range	T <sub>stg</sub>	-55~150	°C	

\* Limited by maximum junction temperature

Characteristic		Symbol	Typ.	Max	Unit
Thermal resistance	Junction-case	R <sub>th(J-C)</sub>	-	1.17	°C/W
	Junction-ambient	R <sub>th(J-A)</sub>	-	62.5	

### Electrical Characteristics

(Tc=25°C)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit	
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=250\ \mu A, V_{GS}=0V$	800	-	-	V	
Gate threshold voltage	$V_{GS(th)}$	$I_D=250\ \mu A, V_{GS}=V_{DS}$	3.0	-	5.0	V	
Drain-source cut-off current	$I_{DSS}$	$V_{DS}=800V, V_{GS}=0V$	-	-	10	$\mu A$	
Gate leakage current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 30V$	-	-	$\pm 100$	nA	
Drain-source on-resistance ④	$R_{DS(on)}$	$V_{GS}=10V, I_D=1.5A$	-	4.0	4.8	$\Omega$	
Forward transfer conductance ④	$g_{fs}$	$V_{DS}=50V, I_D=1.5A$	-	3	-	S	
Input capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=25V$ $f=1\ MHz$	-	562	705	pF	
Output capacitance	$C_{oss}$		-	50	70		
Reverse transfer capacitance	$C_{rss}$		-	5.0	7.5		
Turn-on delay time	$t_{d(on)}$	$V_{DD}=400V, I_D=3.0A$ $R_G=25\ \Omega$	-	15	40	ns	
Rise time	$t_r$		-	43.5	95		
Turn-off delay time	$t_{d(off)}$		③④	-	22.5		55
Fall time	$t_f$		-	32	75		
Total gate charge	$Q_g$	$V_{DS}=640V, V_{GS}=10V$ $I_D=3.0A$	-	18	21.5	nC	
Gate-source charge	$Q_{gs}$		③④	-	3.4		-
Gate-drain charge	$Q_{gd}$		-	5.9	-		

### Source-Drain Diode Ratings and Characteristics

(Tc=25°C)

Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Source current (DC)	$I_S$	Integral reverse diode in the MOSFET	-	-	3.0	A
Source current (Pulsed) ①	$I_{SP}$		-	-	12	
Forward voltage ④	$V_{SD}$	$V_{GS}=0V, I_S=3.0A$	-	-	1.4	V
Reverse recovery time	$t_{rr}$	$I_S=3.0A, V_{GS}=0V$ $dI_S/dt=100A/\mu s$	-	642	-	ns
Reverse recovery charge	$Q_{rr}$		-	4.0	-	$\mu C$

Note ;

- ① Repetitive rating : Pulse width limited by maximum junction temperature
- ②  $L=67mH, I_{AS}=3.0A, V_{DD}=50V, R_G=25\ \Omega$
- ③ Pulse Test : Pulse width  $\leq 300\ \mu s$ , Duty cycle  $\leq 2\%$
- ④ Essentially independent of operating temperature

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