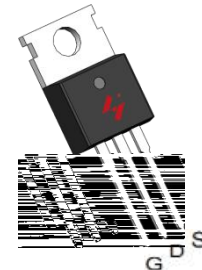


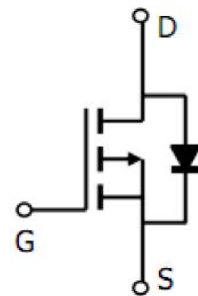
## Single P-Channel Enhancement Mode MOSFET

- -125V/-45A  
 $R_{DS(ON)} = 34m$  (typ.) @  $V_{GS} = -10V$
- 100% Avalanche Tested
- Reliable and Rugged
- Lead- Free Devices Available  
 (RoHS Compliant)




TO-220FB-3L

- High Frequency Point-of-Load Synchronous Buck Converter
- Power Tool Application



Single P-Channel MOSFET

 <b>P</b> <b>G350P13</b> XYMXXXXXX	Package Code P: TO-220FB-3L  Date Code XYMXXXXXX
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Note: HUAYI lead-free products contain molding compounds/die attach materials and 100% matte tin plate Termination finish; which are fully compliant with RoHS. HUAYI lead-free products meet or exceed the lead-Free requirements of IPC/JEDEC J-STD-020 for MSL classification at lead-free peak reflow temperature. HUAYI defines “Green” to mean lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500ppm by weight).

HUAYI reserves the right to make changes, corrections, enhancements, modifications, and improvements to this product and/or to this document at any time without notice.

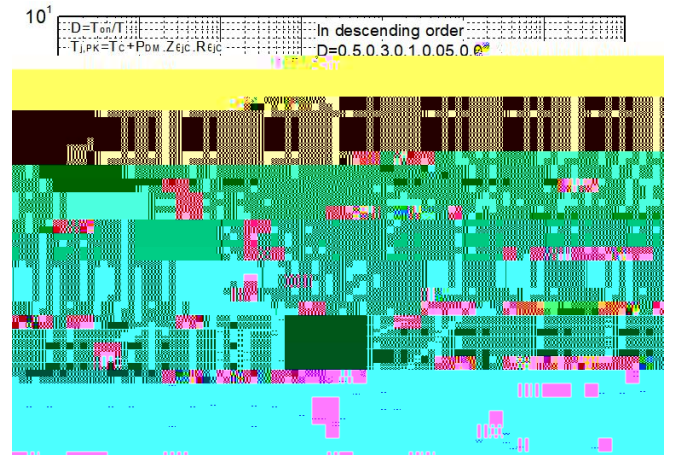
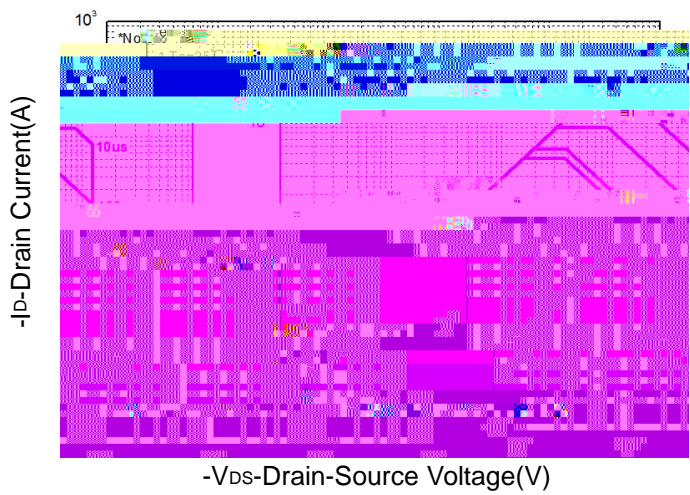
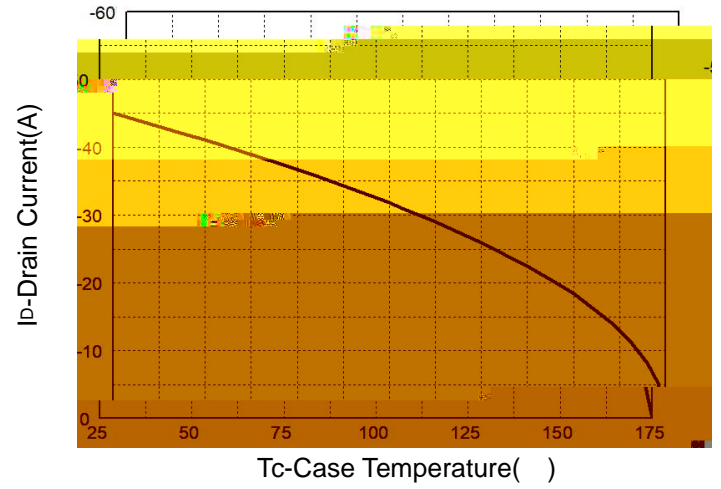
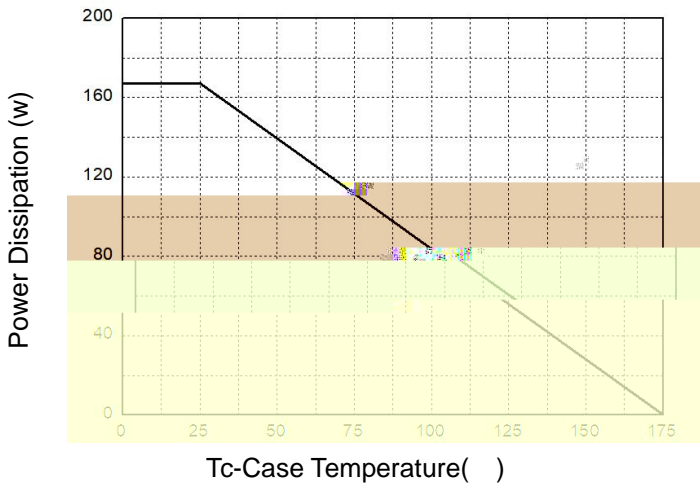
(Tc=25°C Unless Otherwise Noted)

V <sub>DSS</sub>	Drain-Source Voltage	-125	V
V <sub>GSS</sub>	Gate-Source Voltage	± 20	V
T <sub>J</sub>	Maximum Junction Temperature		

(Tc =25°C Unless Otherwise Noted)

$R_G$	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$		-	3.4	-	
$C_{iss}$	Input Capacitance	$V_{GS}=0V,$ $V_{DS}= -25V,$ Frequency=1.0MHz		-	4064	-	pF
$C_{oss}$	Output Capacitance			-	286	-	
$C_{rss}$	Reverse Transfer Capacitance			-	195.4	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-62V, R_G=4 \Omega,$ $I_{DS}=-20A, V_{GS}=-10V$		-	35.4	-	ns
$T_r$	Turn-on Rise Time			-	101.2	-	
$t_{d(OFF)}$	Turn-off Delay Time			-	34.3	-	
$T_f$	Turn-off Fall Time			-	78.4	-	
$Q_{g \ 10V}$	Total Gate Charge	$V_{DS} =-100V, V_{GS}=-10V,$ $I_D=-20A$		-	79.4	-	nC
$Q_{gs}$	Gate-Source Charge			-	13.0	-	
$Q_{gd}$	Gate-Drain Charge			-	30.3	-	

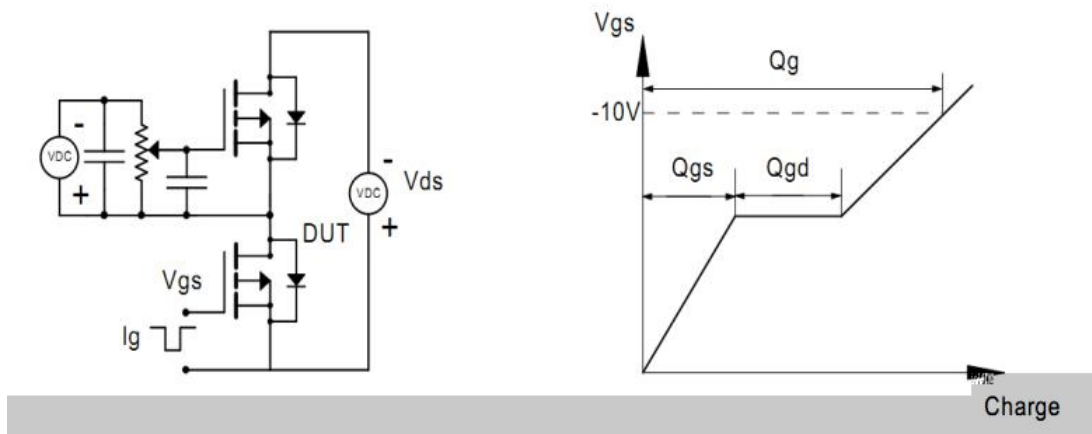
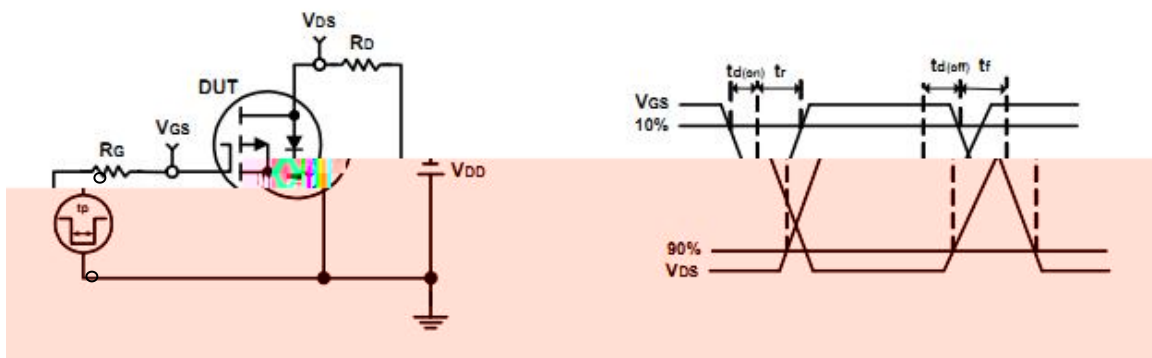
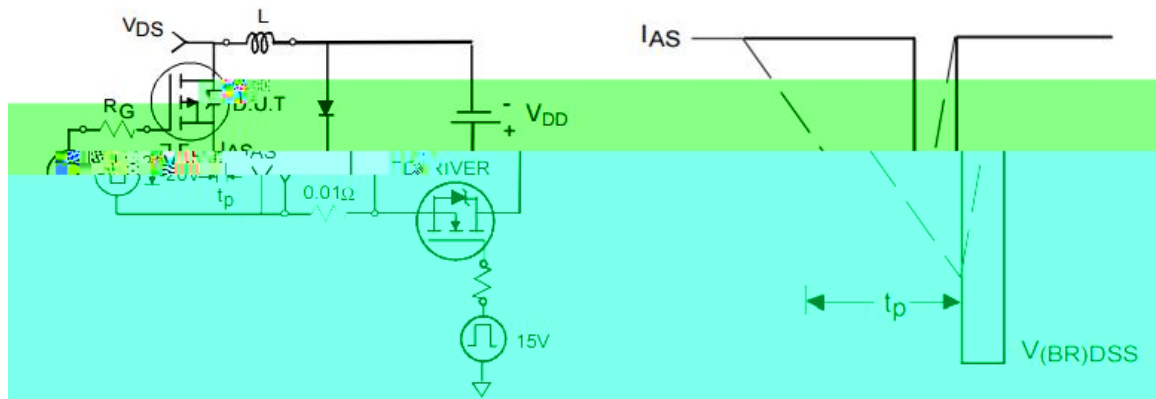
Note: \*Pulse test pulse width 300us duty cycle 2%



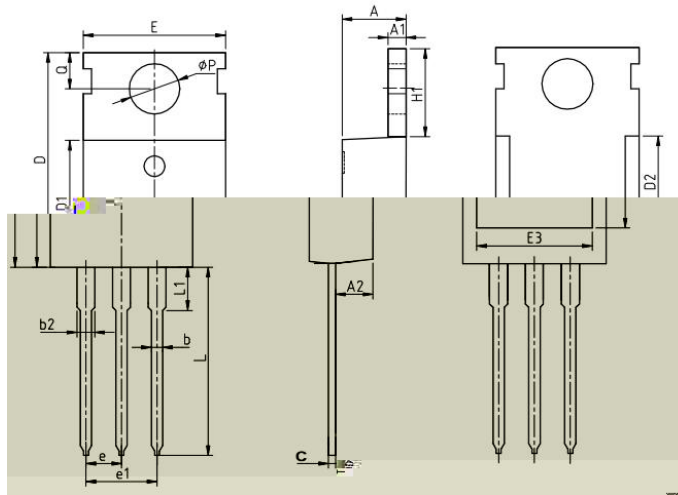
$T_j$ -Junction Temperature ( )

$V_{SD}$ -Source-Drain Voltage(V)

$V_{DS}$ -Drain-Source Voltage(V)

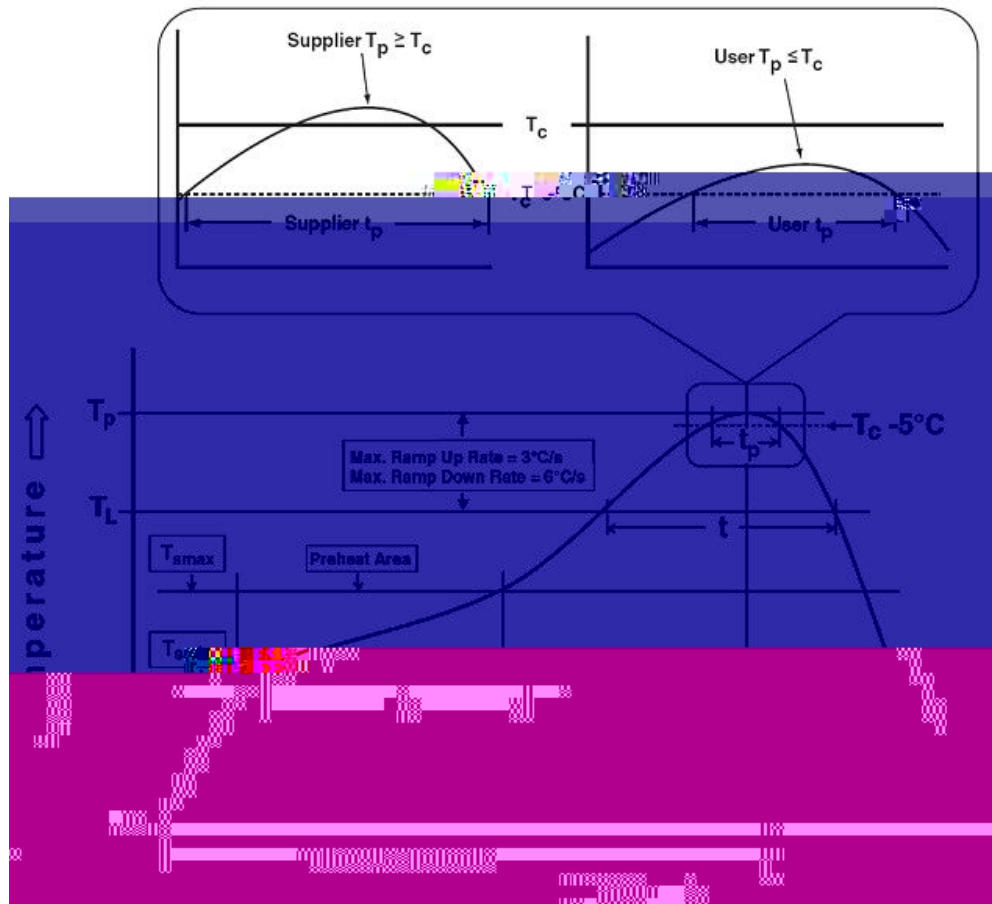


TO-220FB-3L	Tube	50
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COMMON DIMENSIONS

SYMBOL	mm		
	MIN	NOM	MAX
A	4.37	4.57	4.77
A1	1.25	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
P	3.40	3.60	3.80
Q	2.60	2.80	3.00



Temperature min ( $T_{smin}$ )	100 °C	150 °C
Temperature max ( $T_{smax}$ )	150 °C	200 °C
Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60-120 seconds	60-120 seconds
Average ramp-up rate ( $T_{smax}$ to $T_P$ )	3 °C/second max.	3°C/second max.
Liquidous temperature ( $T_L$ )	183 °C	217 °C
Time at liquidous ( $t_L$ )	60-150 seconds	60-150 seconds
Peak package body Temperature ( $T_P$ )*	See Classification Temp in table 1	See Classification Temp in table 2
Time ( $t_P$ )** within 5°C of the specified classification temperature ( $T_c$ )	20** seconds	30** seconds
Average ramp-down rate ( $T_P$ to $T_{smax}$ )	6 °C/second max.	6 °C/second max.
Time 25°C to peak temperature	6 minutes max.	8 minutes max.
*Tolerance for peak profile Temperature ( $T_P$ ) is defined as a supplier minimum and a user maximum.		
** Tolerance for time at peak profile temperature ( $t_P$ ) is defined as a supplier minimum and a user maximum.		



Table 1.SnPb Eutectic Process – Classification Temperatures (Tc)

	3	3
2.5 mm	235 °C	220 °C
2.5 mm	220 °C	220 °C

Table 2.Pb-free Process – Classification Temperatures (Tc)

	3	3	3
<1.6 mm	260 °C	260 °C	260 °C
1.6 mm – 2.5 mm	260 °C	250 °C	245 °C
2.5 mm	250 °C	245 °C	245 °C

SOLDERABILITY	JESD-22, B102	5 Sec, 245°C
HTRB	JESD-22, A108	168Hrs//500Hrs/1000Hrs, Bias @ 150°C
HTGB	JESD-22, A108	168 Hrs/500Hrs/1000Hrs, V <sub>gs</sub> 100% @ 150°C
PCT	JESD-22, A102	96 Hrs, 100%RH, 2atm, 121°C
TCT	JESD-22, A104	500 Cycles, -55°C~150°C

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