



#### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
60V	8.5mΩ@10V	75A

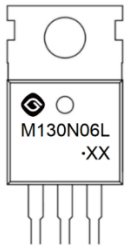
#### Feature

- Trench Technology Power MOSFET
- Low  $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance
- 100% UIS Tested
- 100%  $\Delta V_{DS}$  Tested

#### Application

- Power Switching Application

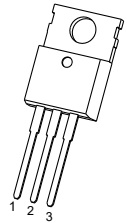
#### MARKING:



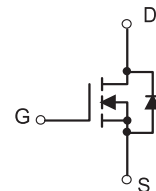
M130N06L = Device Code  
 XX = Date Code  
 Solid Dot = Green Indicator

#### TO-220-3L-C

1. GATE
2. DRAIN
3. SOURCE



#### Schematic diagram



#### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain - Source Voltage	$V_{DS}$	60	V
Gate - Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current <sup>1</sup>	$I_D$	75	A
Continuous Drain Current <sup>1</sup>	$I_D$	50	A
Continuous Drain Current <sup>6</sup>	$I_D$	13	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	225	A
Single Pulsed Avalanche Current <sup>3</sup>	$I_{AS}$	32	A
Single Pulsed Avalanche Energy <sup>3</sup>	$E_{AS}$	256	mJ
Power Dissipation <sup>5</sup>	$P_D$	83	W
Thermal Resistance from Junction to Ambient <sup>6</sup>	$R_{\theta JA}$	50	$^\circ\text{C}/\text{W}$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.5	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-55~ +150	$^\circ\text{C}$

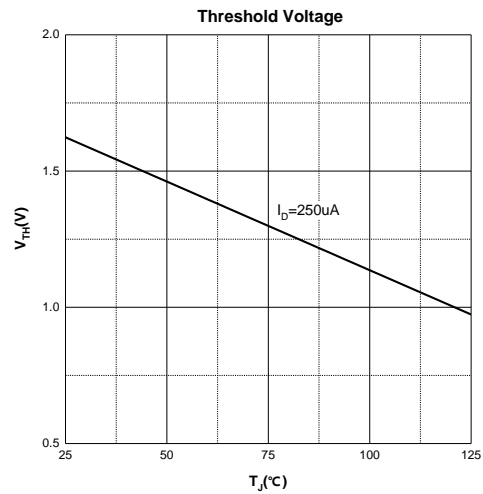
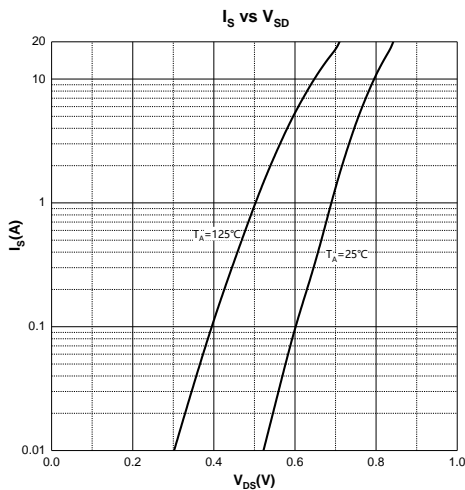
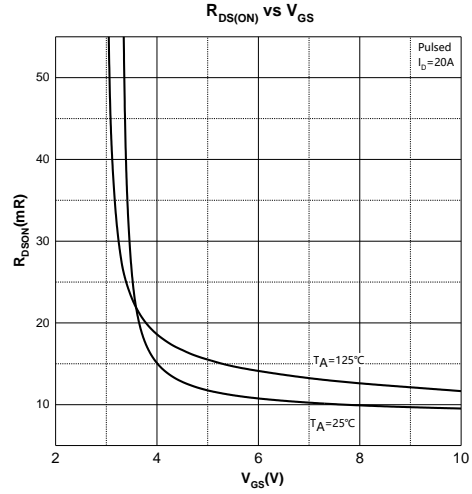
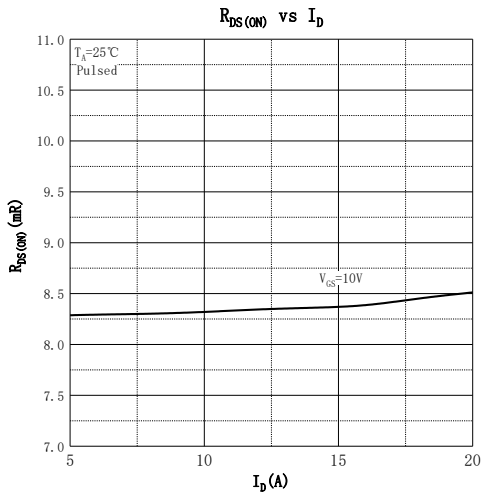
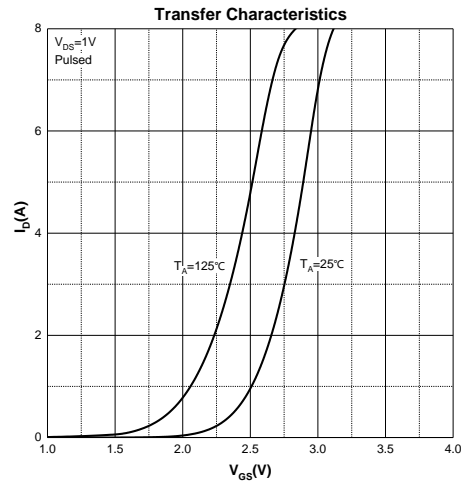
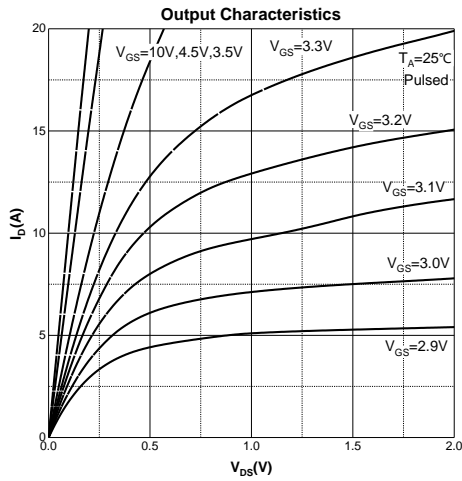
## MOSFET ELECTRICAL CHARACTERISTICS ( $T_J = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Off Characteristics</b>						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 48V, V_{GS} = 0V$			1	$\mu A$
Gate - Body Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
<b>On Characteristics<sup>4</sup></b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.5	3	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		8.5	13	m $\Omega$
		$V_{GS} = 4.5V, I_D = 10A$		11.5	25	
Forward Transconductance	$g_{FS}$	$V_{DS} = 5V, I_D = 10A$		32		S
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 30V, V_{GS} = 0V, f = 1MHz$		2682		pF
Output Capacitance	$C_{oss}$			174		
Reverse Transfer Capacitance	$C_{rss}$			158		
Gate Resistance	$R_g$	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		2		$\Omega$
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 30V, V_{GS} = 10V, I_D = 20A$		50		nC
Gate-source Charge	$Q_{gs}$			15		
Gate-drain Charge	$Q_{gd}$			21		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 30V, V_{GS} = 10V, R_L = 1.5\Omega$ $R_G = 3\Omega$		20		ns
Turn-on Rise Time	$t_r$			12		
Turn-off Delay Time	$t_{d(off)}$			44		
Turn-off Fall Time	$t_f$			15		
<b>Source - Drain Diode Characteristics</b>						
Diode Forward Voltage <sup>4</sup>	$V_{SD}$	$V_{GS} = 0V, I_S = 20A$			1.2	V

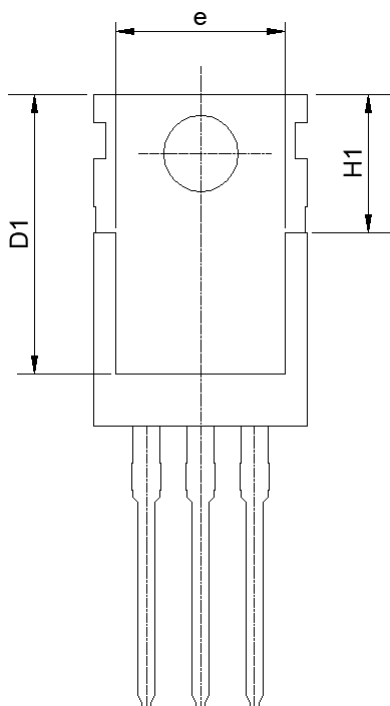
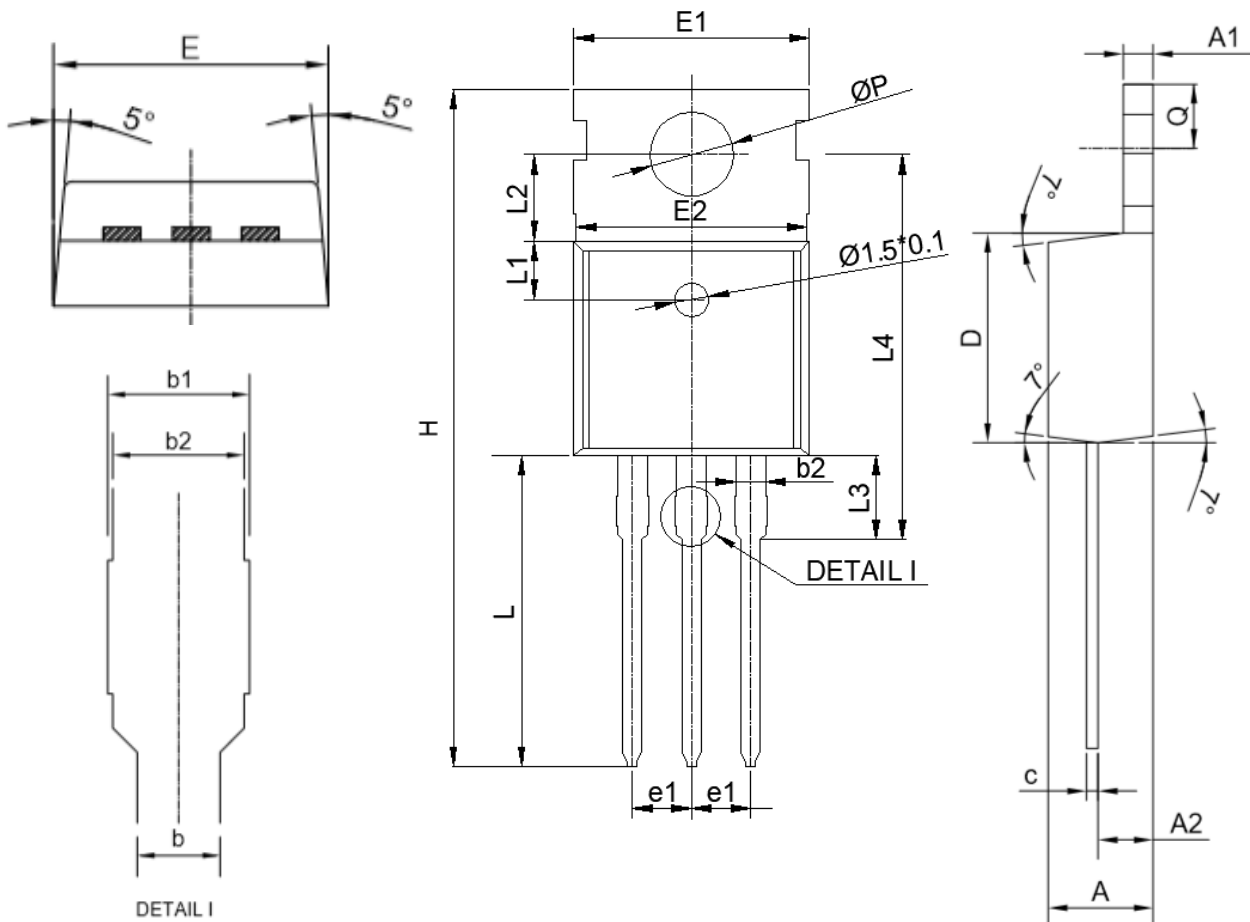
### Notes :

- 1.The maximum current rating is limited by package.And device mounted on a large heatsink
- 2.Pulse Test : Pulse Width  $\leq 10\mu s$ , duty cycle  $\leq 1\%$ .
- 3.EAS condition:  $V_{DD} = 30V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$  Starting  $T_J = 25^\circ\text{C}$ .
- 4.Pulse Test : Pulse Width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
- 5.The power dissipation  $P_D$  is limited by  $T_{J(MAX)} = 150^\circ\text{C}$ .And device mounted on a large heatsink
- 6.Device mounted on  $1in^2$  FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ\text{C}$ .

**Typical Characteristics**



## TO-220-3L-C Package Information



SYMBOL	MIN	NOM	MAX
A	4.56	4.57	4.58
A1	1.28	1.3	1.32
A2	2.3	2.4	2.5
b	0.7	0.8	0.9
b1	1.27	1.37	1.47
b2	1.26	1.27	1.28
c	0.45	0.5	0.6
D	9.14	9.15	9.16
D1	13.2	13.21	13.22
E	9.95	10.05	10.15
E1	10.0	10.05	10.1
E2	9.87	9.88	9.89
e	7.50	8.00	8.40
e1	2.53	2.54	2.55
H	28.8	29	29.2
H1	6.4	6.5	6.6
L	13.05	13.35	13.65
L1	2.4	2.5	2.6
L2	3.6	3.7	3.8
L3	2.92	3	3.08
L4	15.82	15.9	15.98
Q	2.73	2.8	2.87
P	3.6	-	3.65