



Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
30V	3.5mΩ@10V	100A
	5.0mΩ@4.5V	

Feature

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

Application

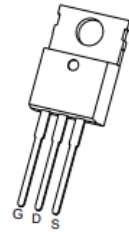
- Power Switching Application

MARKING:

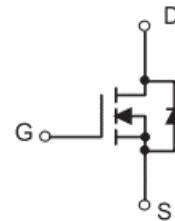


M041N03L = Device Code
XX = Date Code
Solid Dot = Green Indicator

TO-220-3L-C



Schematic diagram



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

Parameter	Symbol	Value	Unit	
Drain - Source Voltage	V_{DS}	30	V	
Gate - Source Voltage	V_{GS}	±20	V	
Continuous Drain Current ¹	$T_C = 25^\circ\text{C}$	I_D	100	A
	$T_C = 100^\circ\text{C}$	I_D	55	A
Continuous Drain Current ⁶	$T_A = 25^\circ\text{C}$	I_D	22	A
Pulsed Drain Current ²	I_{DM}	240	A	
Single Pulsed Avalanche Current ³	I_{AS}	28	A	
Single Pulsed Avalanche Energy ³	E_{AS}	196	mJ	
Power Dissipation ⁵	$T_C = 25^\circ\text{C}$	P_D	84	W
	$T_A = 25^\circ\text{C}$	P_D	2.5	W
Thermal Resistance from Junction to Ambient ⁶	$R_{\theta JA}$	50	$^\circ\text{C/W}$	
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.5	$^\circ\text{C/W}$	
Junction Temperature	T_J	150	$^\circ\text{C}$	
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$	

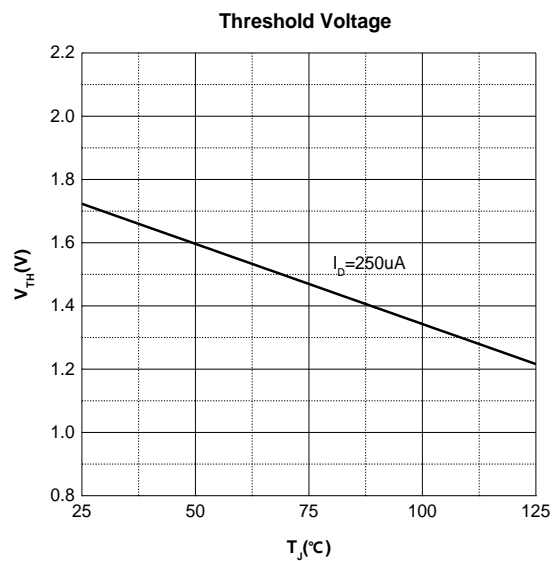
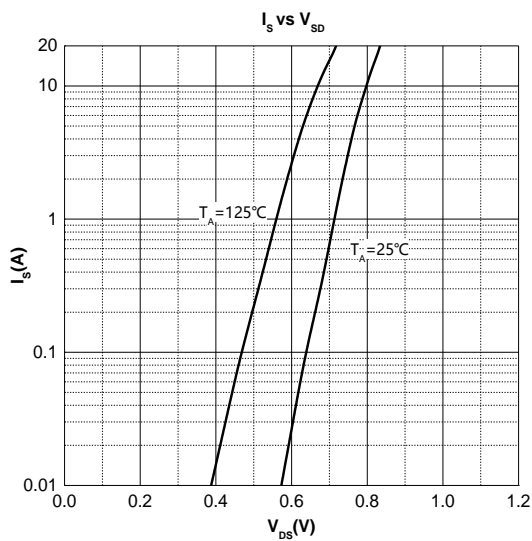
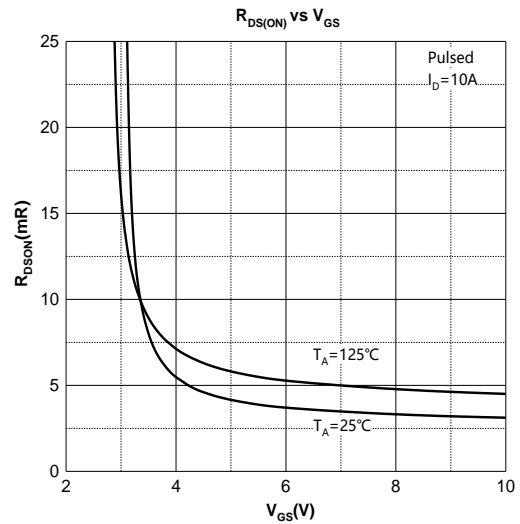
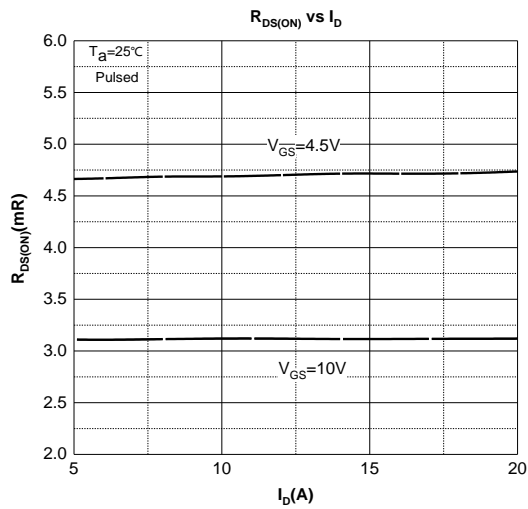
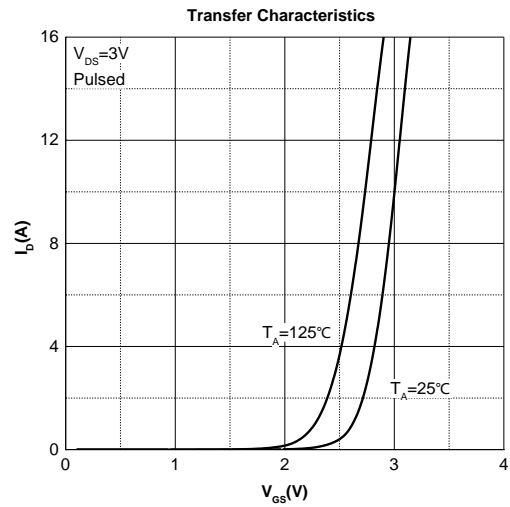
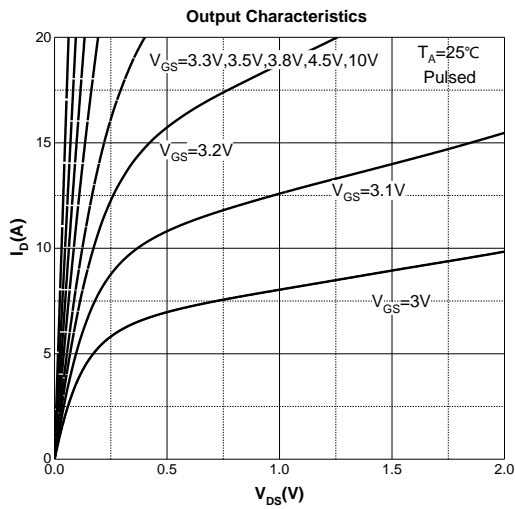
MOSFET ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)

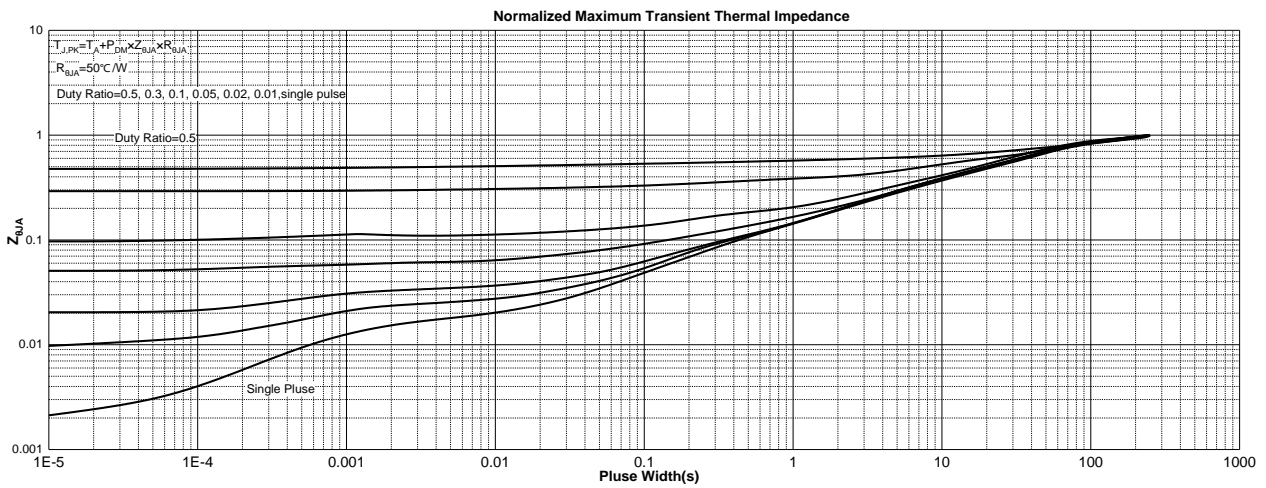
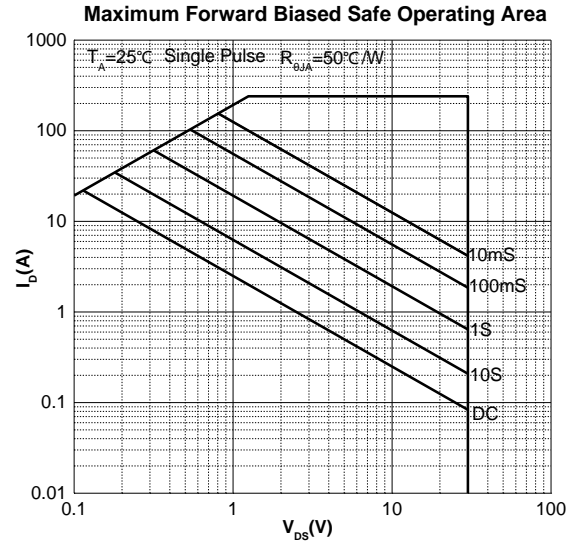
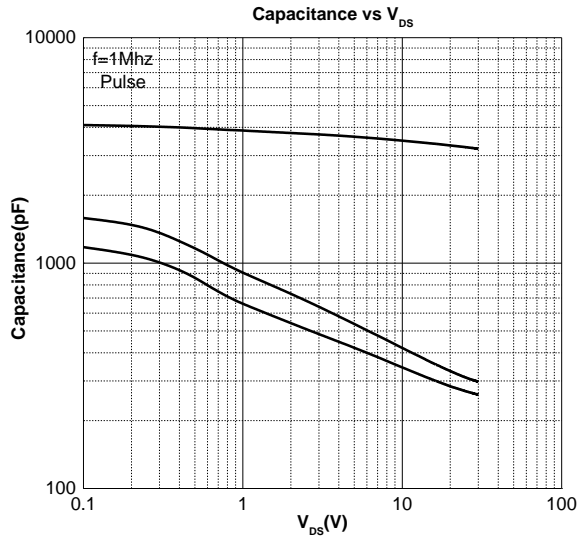
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	30			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 24V, V _{GS} = 0V			1	μA
Gate - Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
On Characteristics⁴						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.0	1.7	3.0	V
Drain-source On-resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 10A		3.5	4.1	mΩ
		V _{GS} = 4.5V, I _D = 10A		5.0	6.5	
Forward Transconductance	g _{FS}	V _{DS} = 10V, I _D = 10A	10	20		S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 15V, V _{GS} = 0V, f = 1MHz		3380		pF
Output Capacitance	C _{oss}			620		
Reverse Transfer Capacitance	C _{rss}			300		
Gate Resistance	R _g	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz		1.9		Ω
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = 15V, V _{GS} = 4.5V, I _D = 20A		33		nC
Gate-source Charge	Q _{gs}			10.6		
Gate-drain Charge	Q _{gd}			20		
Turn-on Delay Time	t _{d(on)}	V _{DD} = 15V, V _{GS} = 10V, R _L = 0.75Ω R _G = 3Ω		13		ns
Turn-on Rise Time	t _r			17		
Turn-off Delay Time	t _{d(off)}			42		
Turn-off Fall Time	t _f			16		
Source - Drain Diode Characteristics						
Diode Forward Voltage ⁴	V _{SD}	V _{GS} = 0V, I _S = 10A			1.2	V

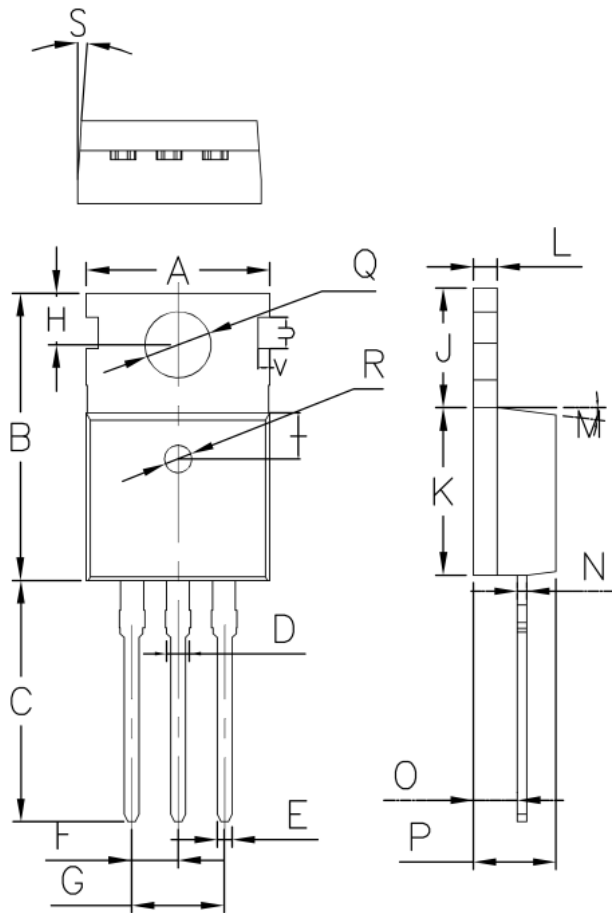
Notes :

- 1.The maximum current rating is limited by package.And device mounted on a large heatsink
- 2.Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.
- 3.E_{AS} condition: V_{DD} = 25V, V_{GS} = 10V, L = 0.5mH, R_G = 25Ω Starting T_J = 25°C.
- 4.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.
- 5.The power dissipation P_D is limited by T_{J(MAX)} = 150°C.And device mounted on a large heatsink
- 6.Device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

Typical Characteristics





TO-220-3L-C Package Information


Symbol	Min	Non	Max
A	9.80	10.00	10.20
B	15.40	15.60	15.80
C	13.02	13.37	13.72
D	1.18	1.31	1.44
E	0.70	0.80	0.90
F	2.42	2.54	2.66
G	4.84	5.08	5.32
H	2.73	2.80	2.87
I	2.40	2.50	2.60
J	6.40	6.50	6.60
K	9.00	9.10	9.20
L	1.29	1.30	1.32
M	6.5°	7.0°	7.5°
N	0.48	0.50	0.56
O	2.35	2.4	2.5
P	4.4	4.5	4.7
Q	3.5	3.6	3.7
R	1.3	1.4	1.5
S	2°	2.5°	3°
U	1.65	1.75	1.85
V	0.58	0.68	0.78