

## TO-263-2L Plastic-Encapsulate MOSFET

### 40V N-Channel MOSFET

#### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
40V	1.6m $\Omega$ @10V	160A

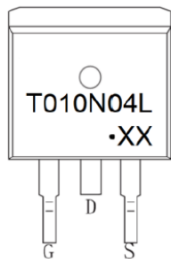
#### Feature

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

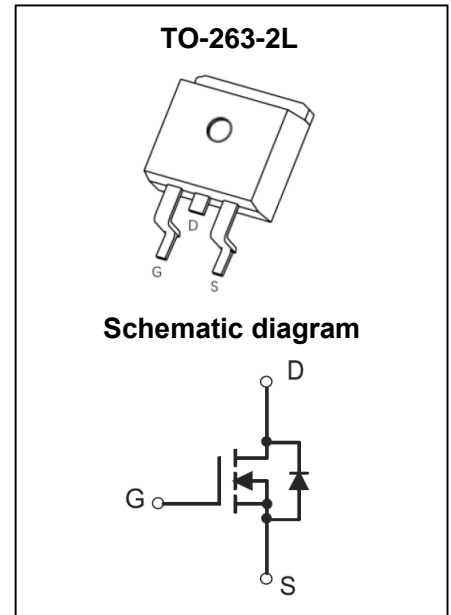
#### Application

- Power Switching Application

#### MARKING:



T010N04L = Device Code  
 XX = Date Code  
 Solid Dot = Green Indicator



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

Parameter	Symbol	Value	Unit	
Drain - Source Voltage	$V_{DS}$	40	V	
Gate - Source Voltage	$V_{GS}$	$\pm 20$	V	
Continuous Drain Current <sup>1</sup>	$T_C = 25^\circ\text{C}$	$I_D$	160	A
	$T_C = 100^\circ\text{C}$	$I_D$	104	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	640	A	
Single Pulsed Avalanche Current <sup>3</sup>	$I_{AS}$	65	A	
Single Pulsed Avalanche Energy <sup>3</sup>	$E_{AS}$	1056	mJ	
Power Dissipation <sup>5</sup>	$T_C = 25^\circ\text{C}$	$P_D$	260	W
Thermal Resistance from Junction to Ambient <sup>6</sup>	$R_{\theta JA}$	45	$^\circ\text{C/W}$	
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.48	$^\circ\text{C/W}$	
Junction Temperature	$T_J$	150	$^\circ\text{C}$	
Storage Temperature	$T_{STG}$	-55~ +150	$^\circ\text{C}$	

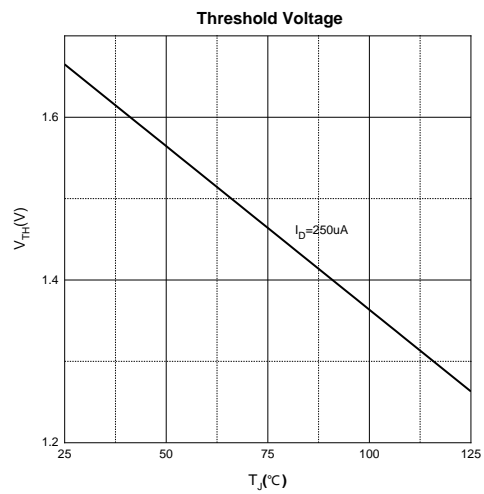
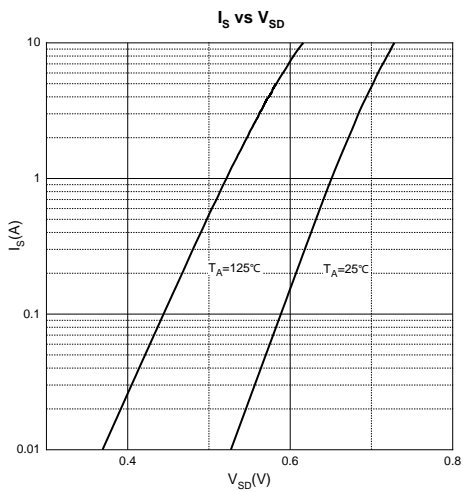
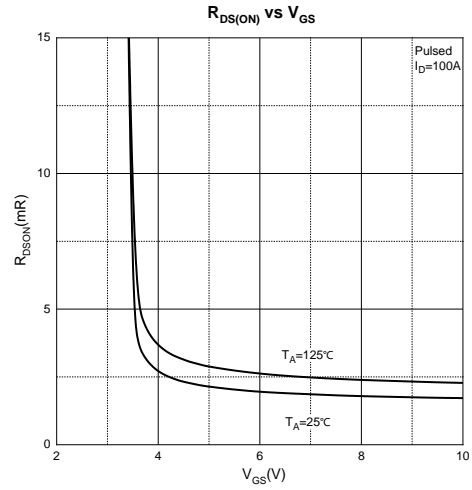
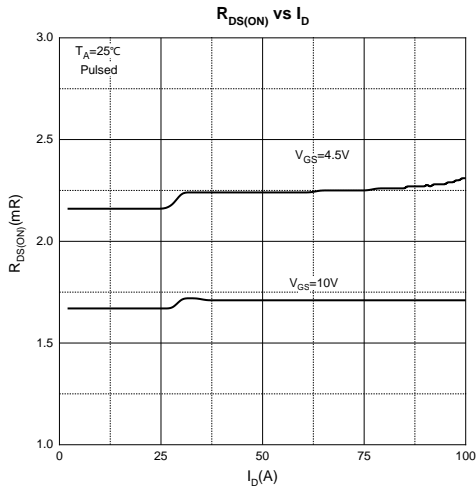
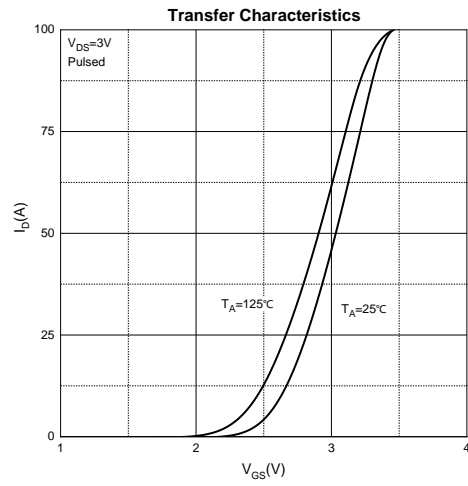
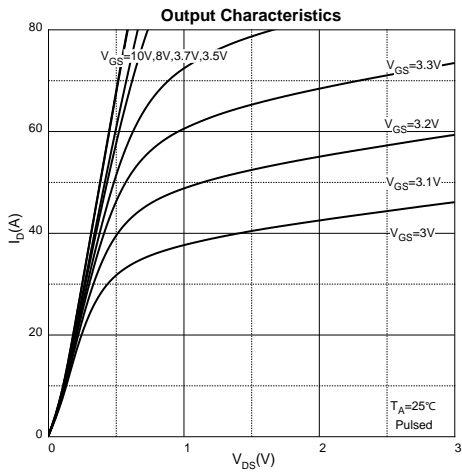
## Electrical Characteristics ( $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Off Characteristics</b>						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 40V, V_{GS} = 0V$			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	1.7	3	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		1.6	2.1	$m\Omega$
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 20V, V_{GS} = 0V, f = 1MHz$		6985		pF
Output Capacitance	$C_{oss}$			1534		
Reverse Transfer Capacitance	$C_{rss}$			252		
Gate Resistance	$R_g$	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		2.9		$\Omega$
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 20V, V_{GS} = 10V, I_D = 10A$		104		nC
Gate-source Charge	$Q_{gs}$			19		
Gate-drain Charge	$Q_{gd}$			16		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 20V, V_{GS} = 10V, I_D = 50A,$ $R_G = 4\Omega$		15		ns
Turn-on Rise Time	$t_r$			8		
Turn-off Delay Time	$t_{d(off)}$			58		
Turn-off Fall Time	$t_f$			10		
<b>Source - Drain Diode Characteristics</b>						
Diode Forward Voltage <sup>4</sup>	$V_{SD}$	$V_{GS} = 0V, I_S = 10A$			1.2	V

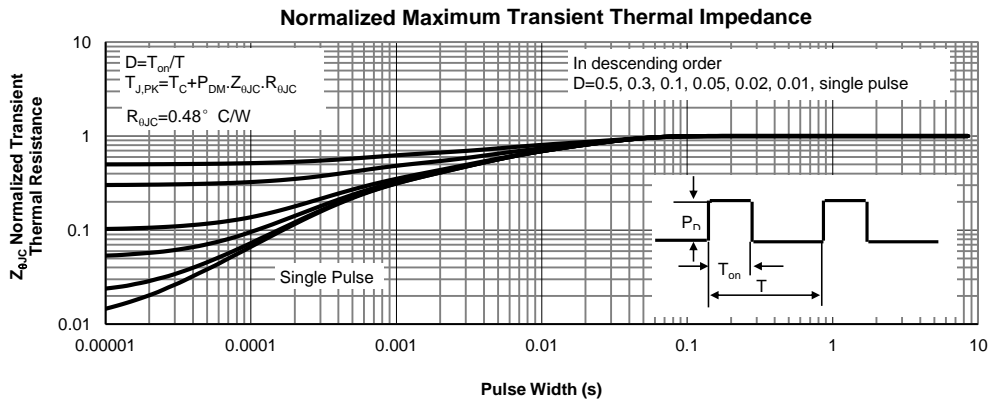
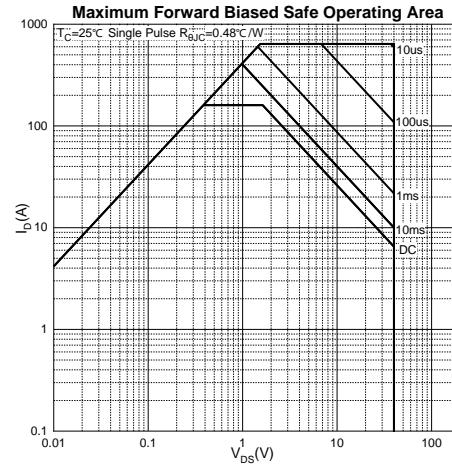
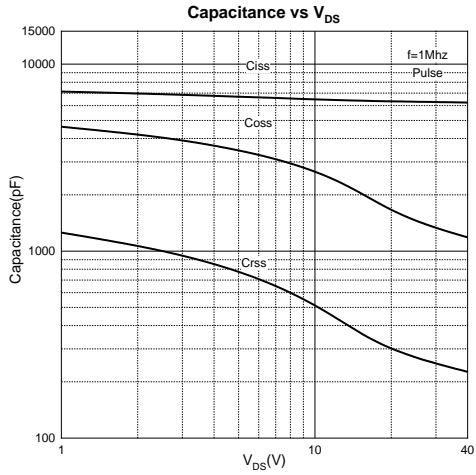
Notes :

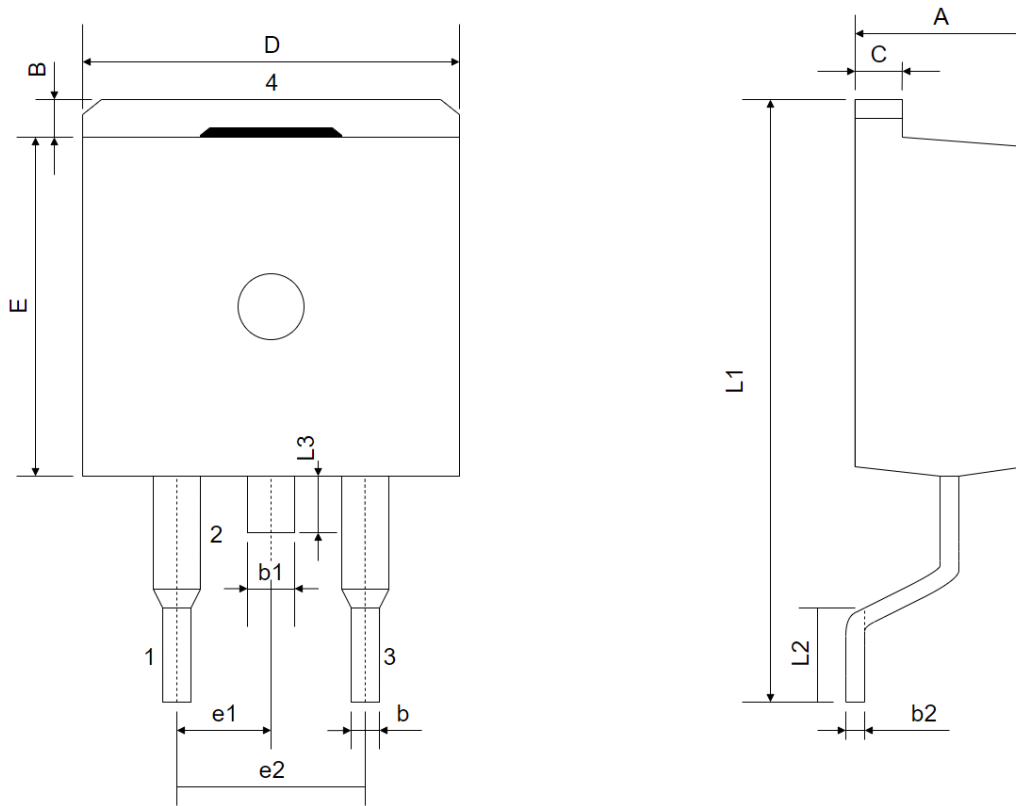
- 1.The maximum current rating is limited by package.And device mounted on a large heatsink
- 2.Pulse Test : Pulse Width  $\leq 10\mu s$ , duty cycle  $\leq 1\%$ .
3. $E_{AS}$  condition:  $V_{DD} = 20V, V_{GS} = 10V, L = 0.5mH, R_G = 25\Omega$  Starting  $T_J = 25^{\circ}\text{C}$ .
- 4.Pulse Test : 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



# Typical Characteristics





Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.300	4.700	0.169	0.185
B	1.000	1.400	0.039	0.055
b	0.700	0.900	0.028	0.035
b1	1.150	1.350	0.045	0.053
b2	0.400	0.600	0.016	0.024
C	1.200	1.400	0.047	0.055
D	9.800	10.200	0.386	0.402
E	9.000	9.400	0.354	0.370
e1	2.340	2.740	0.092	0.108
e2	4.880	5.280	0.192	0.208
L1	15.000	16.000	0.591	0.630
L2	2.240	2.840	0.088	0.112
L3	1.200	1.600	0.047	0.063

NOTICE

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