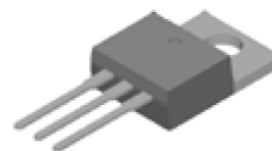


400V/18A Power MOSFET (N-Channel)

General Description

- MSU18N40T is a N-Channel enhancement mode power MOSFET with advanced technology. It is designed to have Better characteristics, such as fast switching time, low gate charge, minimized on-state resistance and withstanding high energy pulse in the avalanche and commutation modes. These devices are well suited for high efficiency switching mode power supply applications.
- MSU18N40T is generally used as a load switch or applied in PWM applications.



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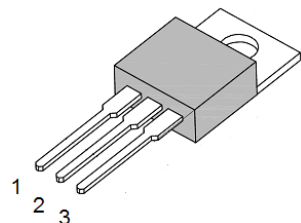


HALOGEN
FREE

Features

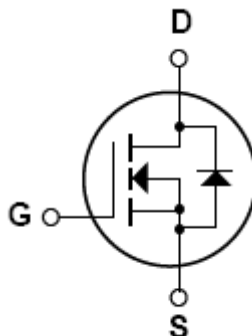
- $R_{DS(ON)} \leq 0.24\Omega @ V_{GS}=10V$
- Fast switching capability
- Avalanche energy tested
- RoHS Compliance and Halogen free

Pin Configuration and Symbol



1: GATE 2: DRAIN 3: SOURCE

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400V/18A POWER MOSFET (N-Channel)

MSU18N40T

Absolute Maximum Ratings *(T_C=25°C unless otherwise specified, Note)*

Symbol	Description	Ratings	Unit
V_{DSS}	Drain-Source Voltage	400	V
V_{GSS}	Gate-Source Voltage	± 30	V
I_D	Drain Current -Continuous	18	A
I_{DM}	Drain Current -Pulsed	72	A
I_{AR}	Avalanche Current	18	A
E_{AS}	Single Pulsed Avalanche Energy	1000	mJ
E_{AR}	Repetitive Avalanche Energy	30	mJ
DV/dt	Peak Diode Recovery	10	V/ns
P_D	Maximum Power Dissipation	235	W
R_{θJC}	Thermal Resistance (Junction-to-Case)	0.53	°C/W
T_J	Junction Temperature	+150	°C
T_{STG}	Storage Temperature Range	-55 to +150	°C

Note1: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

400V/18A POWER MOSFET (N-Channel)

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Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Description	Min.	Typ.	Max.	Unit	Conditions	
OFF CHARACTERISTICS							
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	400	-	-	V	$V_{GS}=0V, I_D=250\mu A$	
I_{DSS}	Drain-Source leakage Current	-	-	25	μA	$V_{DS}=400V, V_{GS}=0V$	
I_{GSS}	Gate-Source leakage Current	Forward	-	-	100	nA	$V_{GS}=30V$
		Reverse	-	-	-100	nA	$V_{GS}=-30V$
ON CHARACTERISTICS							
$V_{GS(th)}$	Gate-Source Threshold Voltage	2.0	-	4.0	V	$V_{DS}=V_{GS}, I_D=250\mu A$	
$R_{DS(on)}$	Static Drain-Source On-State Resistance	-	0.18	0.24	Ω	$V_{GS}=10V, I_D=9A$	
DYNAMIC CHARACTERISTICS							
C_{iss}	Input Capacitance	-	2500	-	pF	$V_{DS}=25V, V_{GS}=0V, f=1.0MHz$	
C_{oss}	Output Capacitance	-	280	-	pF		
C_{rss}	Reverse Transfer Capacitance	-	23	-	pF		
SWITCHING CHARACTERISTICS							
$t_d(on)$	Turn-on Delay Time	-	21	-	nS	$V_{GS}=10V, V_{DS}=0.5V_{DSS}, I_D=9A$ (Note 1,2)	
t_r	Turn-on Rise Time	-	22	-	nS		
$t_d(off)$	Turn-off Delay Time	-	62	-	nS		
t_f	Turn-off Fall Time	-	22	-	nS		
Q_g	Total Gate Charge	-	50	-	nC	$V_{GS}=10V, V_{DS}=0.5V_{DSS}, I_D=18A, R_G=5\Omega$ (Note 1,2)	
Q_{gs}	Gate-Source Charge	-	15	-	nC		
Q_{gd}	Gate-Drain Charge	-	18	-	nC		
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS							
V_{SD}	Drain-Source Diode Forward Voltage	-	-	1.5	V	$V_{GS}=0V, I_F=I_S$	
I_S	Maximum Continuous Drain-Source Diode Forward Current	-	-	18	A	$V_{GS}=0V$	
I_{SM}	Maximum Pulse Drain-Source Diode Forward Current	-	-	72	A	Repetitive	
t_{rr}	Reverse Recovery Time	-	-	200	nS	$V_{GS}=0V, I_S=18A$ $di_F/dt=100A/\mu s, V_R=100V$ (Note 1)	
Q_{rr}	Reverse Recovery Charge	-	0.8	-	μC		

Note 1: Pulse test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
 2: Essentially independent of operating temperature

Typical Characteristics Curves

Fig.1- Drain Current vs. Source to Drain Voltage

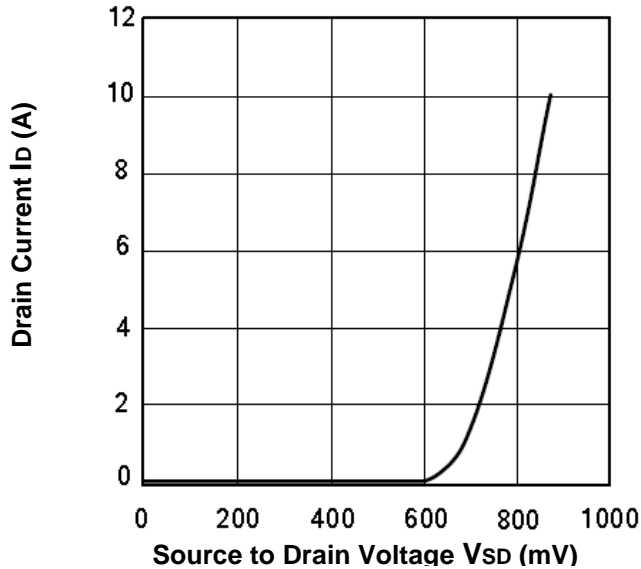


Fig.2- Drain to Source On-State Resistance Characteristics

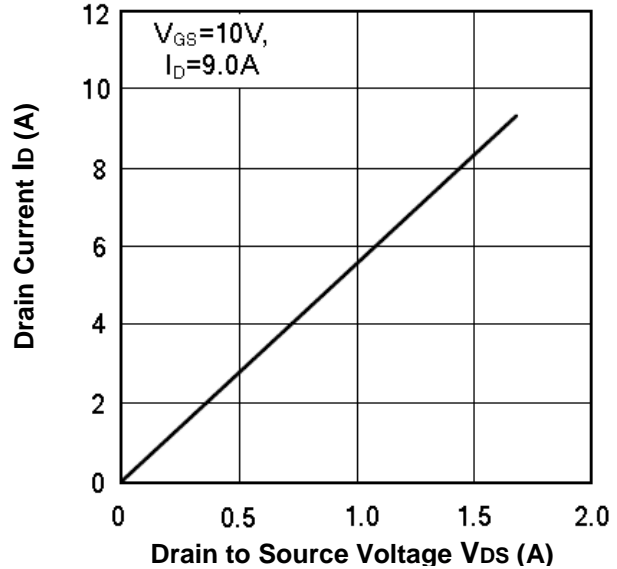


Fig.3- Drain Current vs. Gate Threshold Voltage

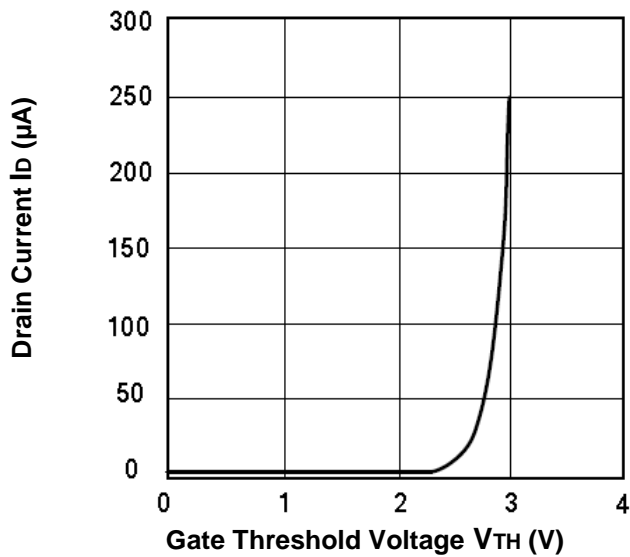
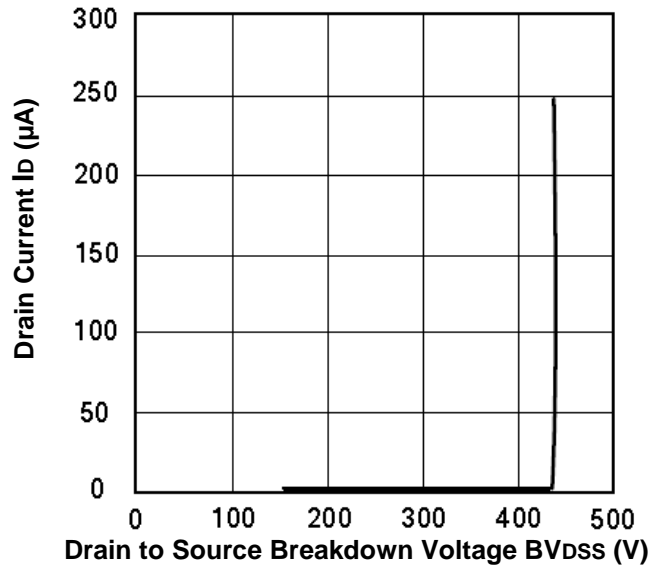


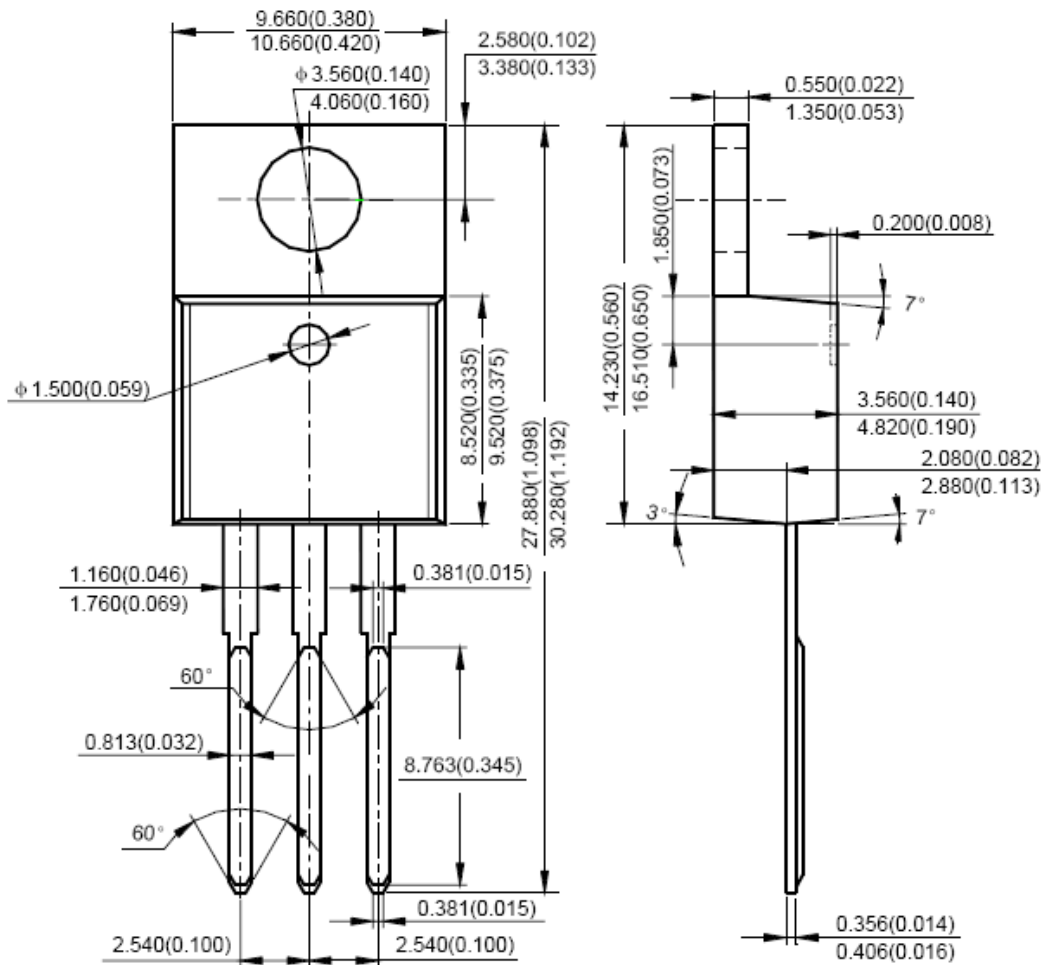
Fig.2- Drain Current vs. Drain to Source Breakdown Voltage



400V/18A POWER MOSFET (N-Channel)

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Dimensions in mm (inch)

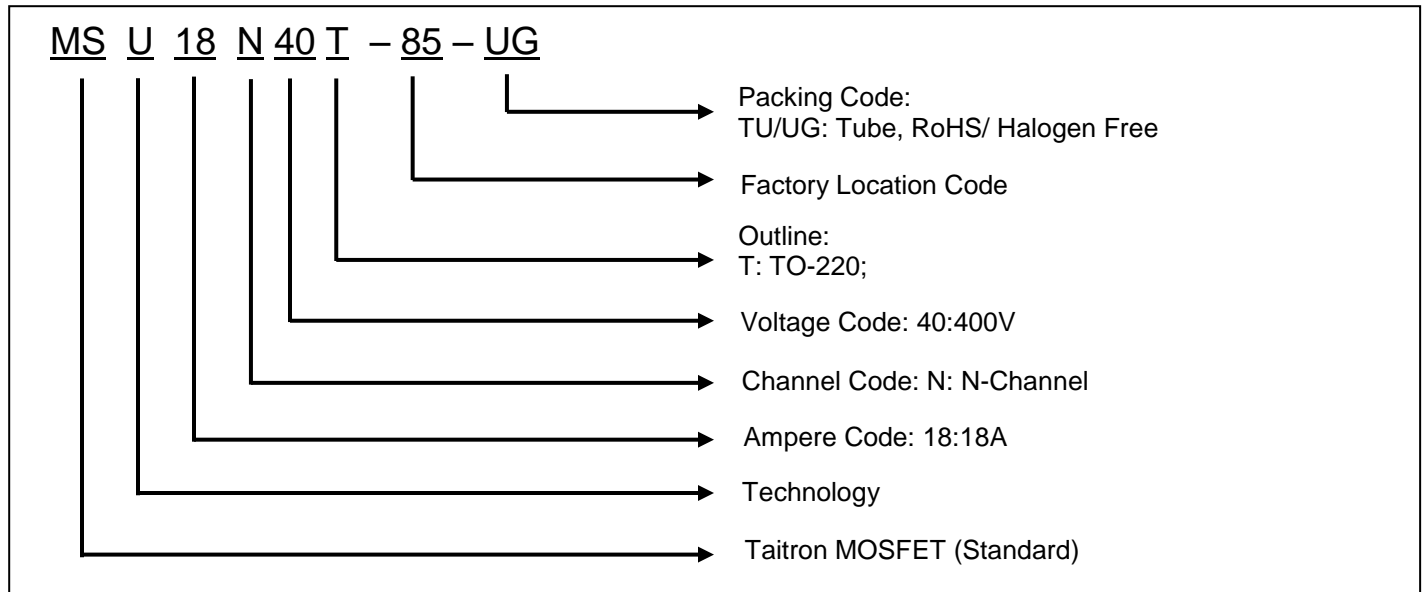


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400V/18A POWER MOSFET (N-Channel)

MSU18N40T

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