MLSY162N04

40V/162A N-Channel MOSFET

Features

- Low $R_{DS(on)}$ & FOM
- Extremely low switching loss
- Excellent stability and uniformity
- Fast switching and soft recovery

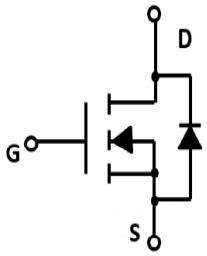
Application

- Power switch circuit of POWER
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)

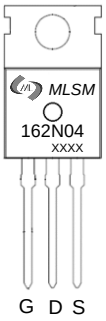
Product Summary

V_{DS}	$R_{DS(ON)}$ TYP	I_D
40V	4mΩ@10V	162A

TO-220 top view



Schematic diagram



162N04 : Device code
XXXX : Code

Marking and pin assignment

Pb-Free RoHS Halogen-Free

Absolute Maximum Ratings (T_A=25℃unless otherwise noted)

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DS}	Drain-Source Breakdown Voltage		40	V
V_{GS}	Gate-Source Voltage		±20	V
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	°C
I_S	Diode Continuous Forward Current	Tc=25°C	162	A
Mounted on Large Heat Sink				
I_{DM}	Pulse Drain Current Tested	Tc=25°C	648	A
I_D	Continuous Drain Current	Tc=25°C	162	A
P_D	Maximum Power Dissipation	Tc=25°C	171	W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient		62.5	°C/W
E_{AS}	Single Pulse Avalanche Energy[Note1]		1980	mJ

Ordering Information (Example)

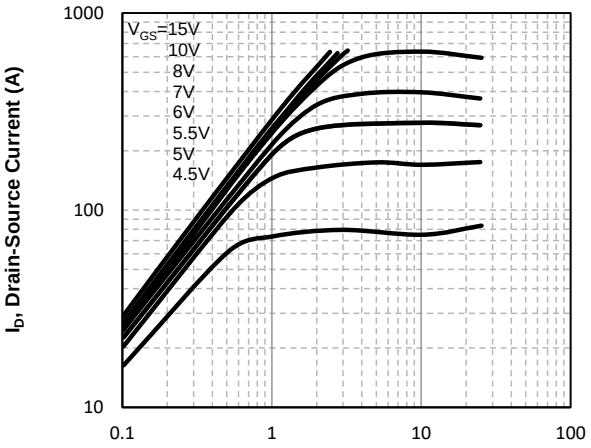
Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)
MLSY162N04	TO-220	162N04	50	1,000	5,000

Electrical Characteristics (TJ=25℃ unless otherwise noted)						
Symbol	**Parameter**	**Condition**	**Min**	**Typ**	**Max**	**Unit**
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
$BV_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V，I_D=250μA	40	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=40V，V_{GS}=0V	--	--	20	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V，V_{DS}=0V	--	--	±200	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}，I_D=250μA	2.0	--	4.0	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V， I_D=60A	--	4.0	5.0	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C_{ISS}	Input Capacitance	V_{DS}=25V，V_{GS}=0V， f=1MHz	--	3840	--	pF
C_{OSS}	Output Capacitance		--	1710	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	470	--	pF
Switching Characteristics						
Q_g	Total Gate Charge	V_{DD}=20V，I_D=162A，V_{GS}=10V	--	96	--	nC
Q_{gs}	Gate Source Charge		--	19	--	nC
Q_{gd}	Gate Drain Charge		--	46	--	nC
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=20V，I_D=162A，V_{GS}=10V，R_G=10Ω	--	32	--	nS
t_r	Turn-on Rise Time		--	92	--	nS
$t_{d(off)}$	Turn-Off Delay Time		--	101	--	nS
t_f	Turn-Off Fall Time		--	69	--	nS
Source- Drain Diode Characteristics						
V_{SD}	Forward on voltage	Tj=25℃，Is=30A	--	--	1.2	V

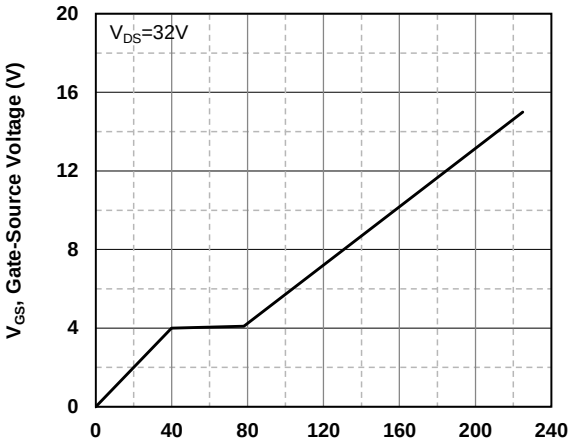
Note :

1、EAS Test condition : V_{DD}=20V,V_{GS}=10V,L=1mH,R_G=25Ω,Starting Tj=25° C.

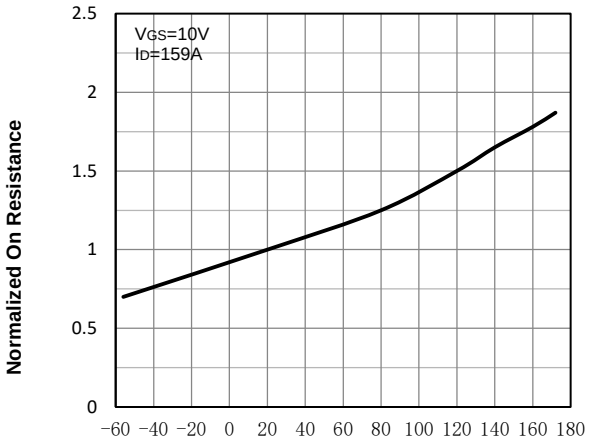
Typical Operating Characteristics



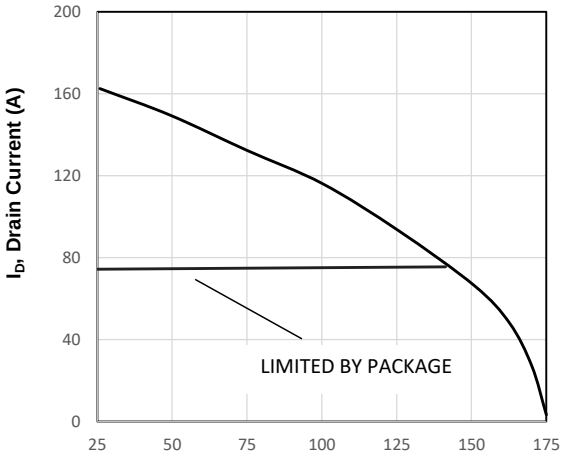
V_{DS}, Drain -Source Voltage (V)
Fig1. Typical Output Characteristics



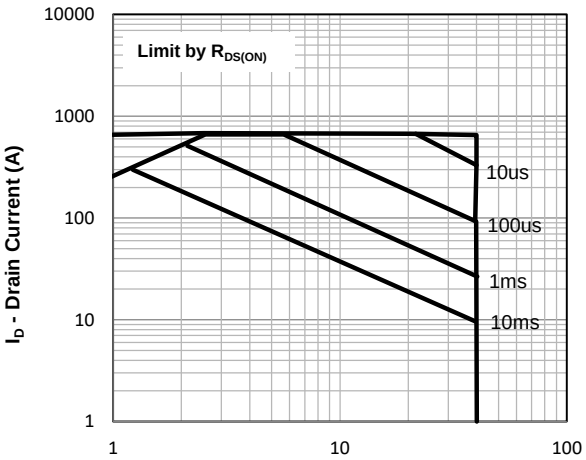
Qg -Total Gate Charge (nC)
Fig2. Typical Gate Charge Vs.Gate-Source Voltage



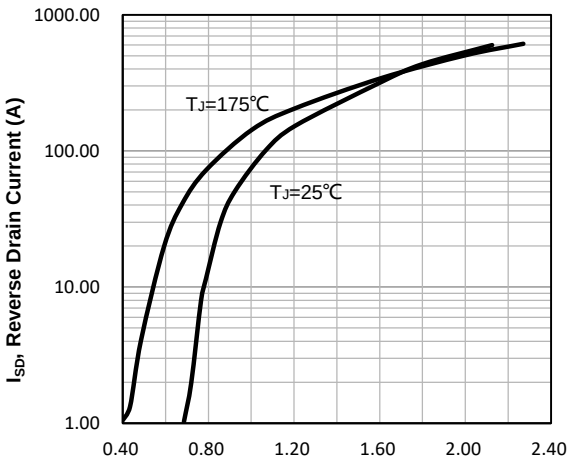
Tj - Junction Temperature (°C)
Fig3. Normalized On-Resistance Vs. Temperature



T_C, Case Temperature
Fig4. Maximum Drain Current Vs. Case Temperature

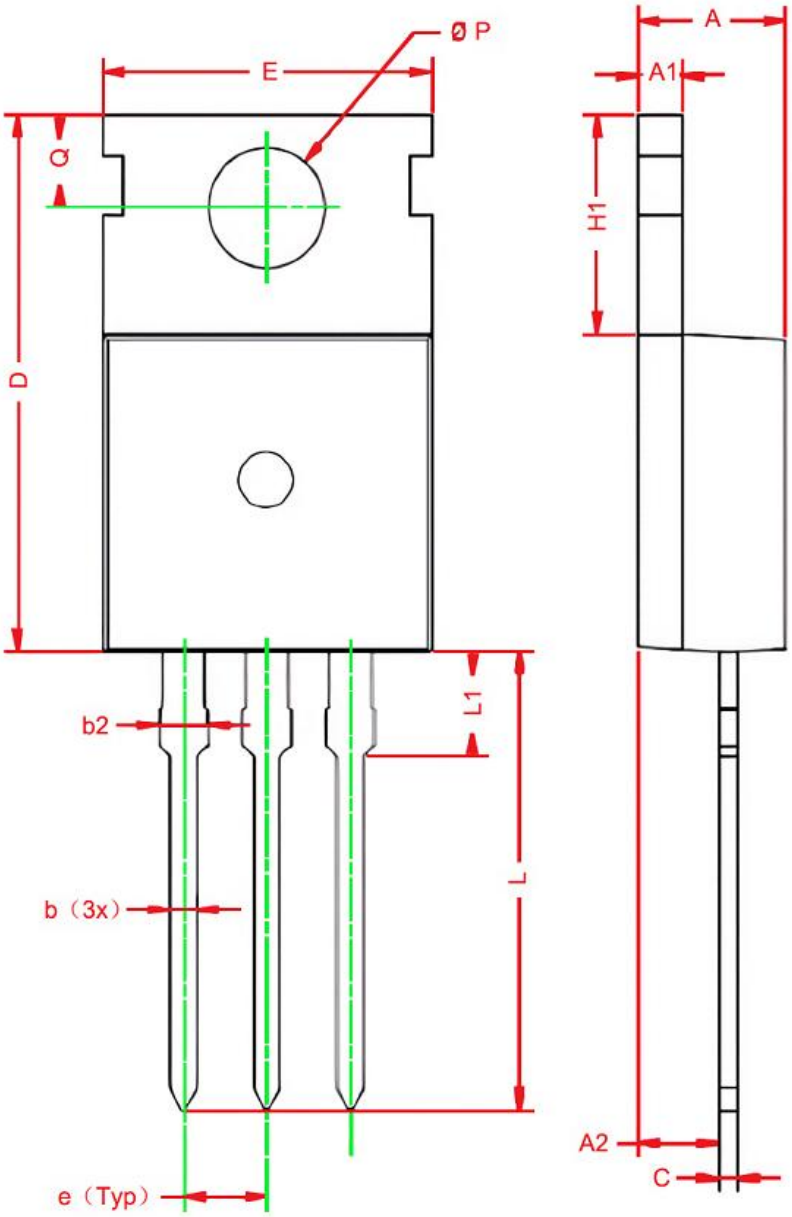


V_{DS}, Drain -Source Voltage (V)
Fig5. Maximum Safe Operating Area



V_{SD} , Source-Drain Voltage (V)
Fig6 Typical Source-Drain Diode Forward Voltage

TO-220 Package information



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	3.600	4.800	0.142	0.189
A1	1.200	1.400	0.047	0.055
A2	2.030	2.900	0.080	0.114
b	0.400	1.000	0.016	0.039
b2	1.200	1.780	0.047	0.070
c	0.360	0.600	0.014	0.024
D	14.220	16.500	0.561	0.651
e	2.340	2.740	0.092	0.108
E	9.700	10.600	0.383	0.418
H1	5.840	6.850	0.230	0.270
L	12.700	14.700	0.501	0.580
L1	2.700	3.300	0.106	0.130
ØP	3.500	4.000	0.138	0.158
Q	2.540	3.400	0.100	0.134