

Features

- Integrate fast recovery diode
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

Application

- Switch Mode Power Supply (SMPS)
- Motor Controls
- Power Factor Correction (PFC)



Halogen-Free

Product Summary

V_{DS}	$R_{DS(ON)}$ TYP	I_D
200V	120mΩ@10V	18A



TO-252



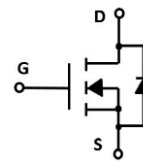
TO-220



TO-247



TO-251



Absolute Maximum Ratings (TA=25°C unless otherwise noted)

Symbol	Parameter		Value				Unit
Common Ratings (TC=25°C Unless Otherwise Noted)			TO-252	TO-220	TO-247	TO-251	
V _{DS}	Drain-Source Breakdown Voltage		200				V
V _{GS}	Gate-Source Voltage		±20				V
T _J	Maximum Junction Temperature		150				°C
T _{STG}	Storage Temperature Range		-50 to 155				°C
I _S	Diode Continuous Forward Current	Tc=25°C	18				A

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	$T_C=25^{\circ}C$	72			A
I_D	Continuous Drain Current@GS=10V	$T_C=25^{\circ}C$	18			A
P_D	Maximum Power Dissipation	$T_C=25^{\circ}C$	63.7	104		W
R_{thJA}	Thermal Resistance, Junction-to-Ambient		62.5	60		°C/W
E_{AS}	Single pulse avalanche energy ^(Notes1)		262.7			mJ

Ordering Information (Example)

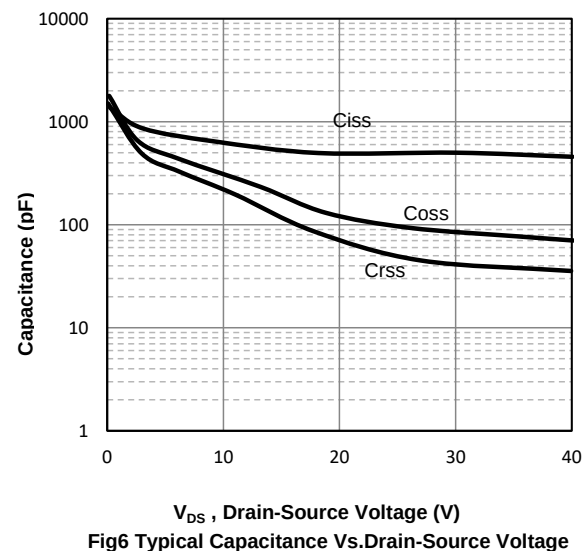
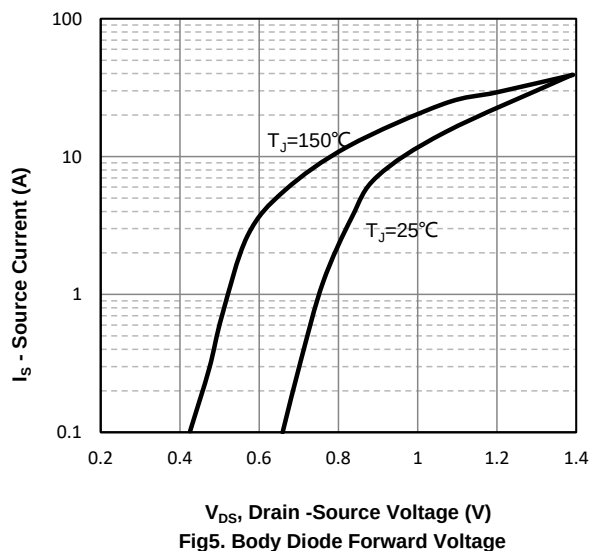
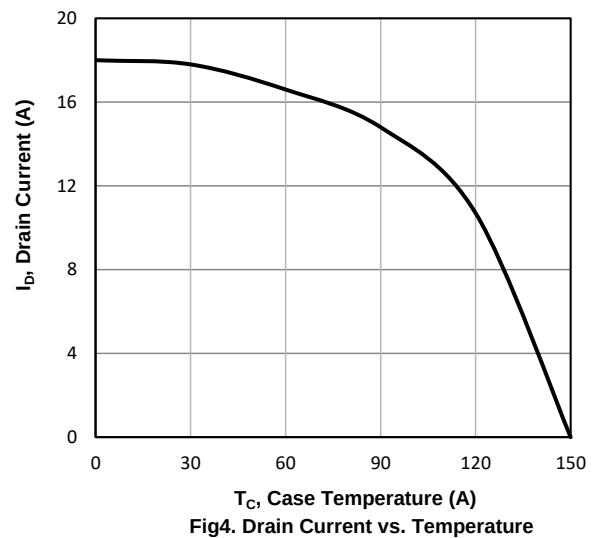
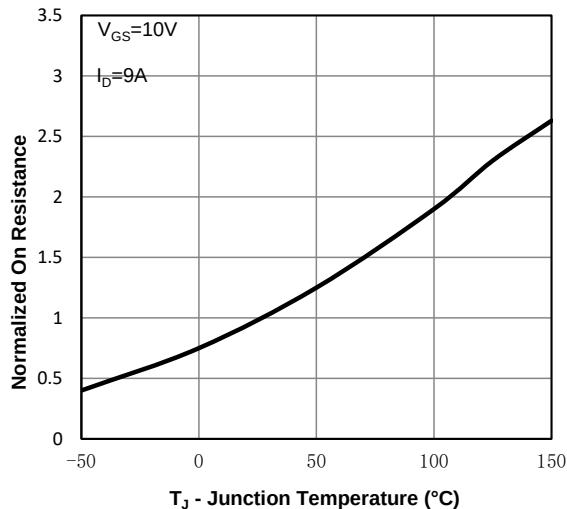
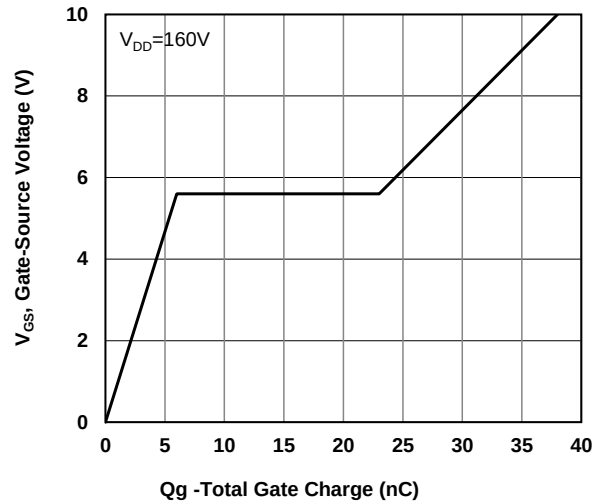
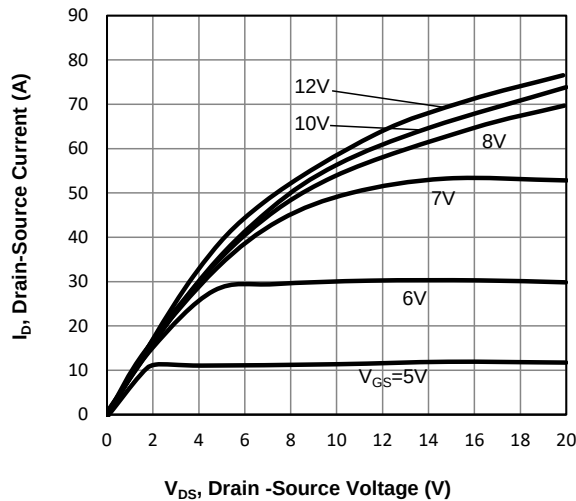
Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLSU18N20	TO-252	MLSU18N20	2,500	5,000	35,000	13"reel
MLSY18N20	TO-220	MLSY18N20	50	1,000	5,000	/
MLSA18N20	TO-247	MLSA18N20	30	270	2,160	/
MLSD18N20	TO-251	MLSD18N20	80	4,000	20,000	/

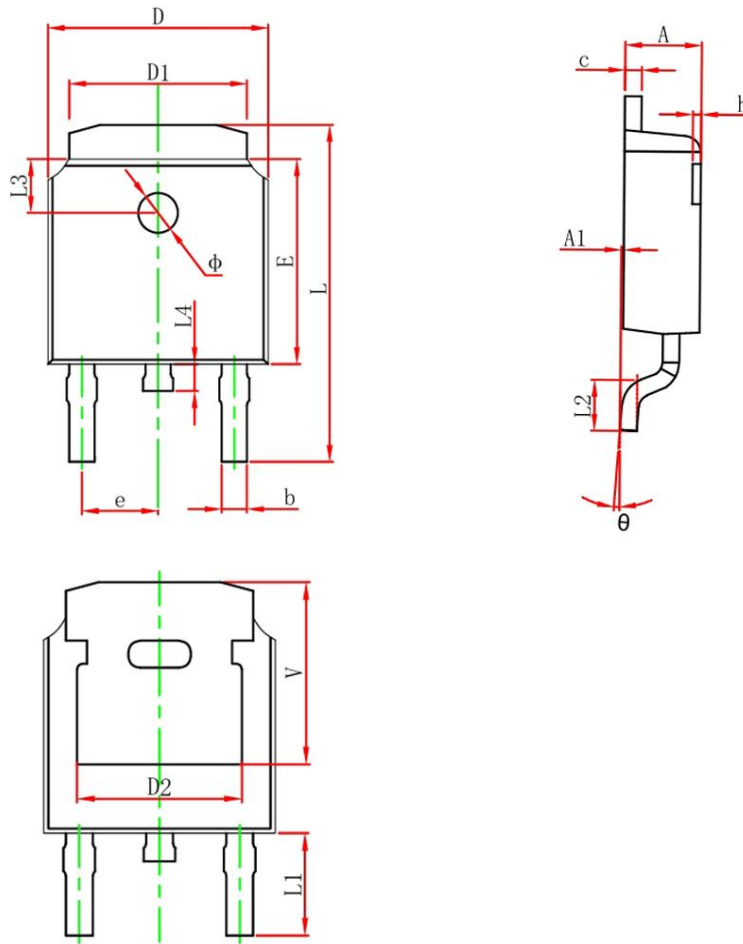
Electrical Characteristics (TJ=25℃ unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ TJ = 25℃ (unless otherwise stated)						
BV _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	200	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =200V, V _{GS} =0V	--	--	1.0	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V	--	--	±100	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 =9A	--	120	150	mΩ
Dynamic Electrical Characteristics @ TJ = 25℃ (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	--	1200	--	pF
C _{OSS}	Output Capacitance		--	161	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	70	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DD} =160V, I _D =18A, V _{GS} =10V	--	38	--	nC
Q _{gs}	Gate Source Charge		--	6	--	nC
Q _{gd}	Gate Drain Charge		--	16	--	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =100V, I _D =18A, R _G =25Ω	--	40	--	nS
t _r	Turn-on Rise Time		--	33	--	nS
t _{d(off)}	Turn-Off Delay Time		--	166	--	nS
t _f	Turn-Off Fall Time		--	60	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	Tj=25℃, Is=9A,	--	--	1.4	V

Note:

1、 $I_{AS}=15A, V_{DD}=50V, R_G=25\Omega$, Starting $T_J=25^\circ C$

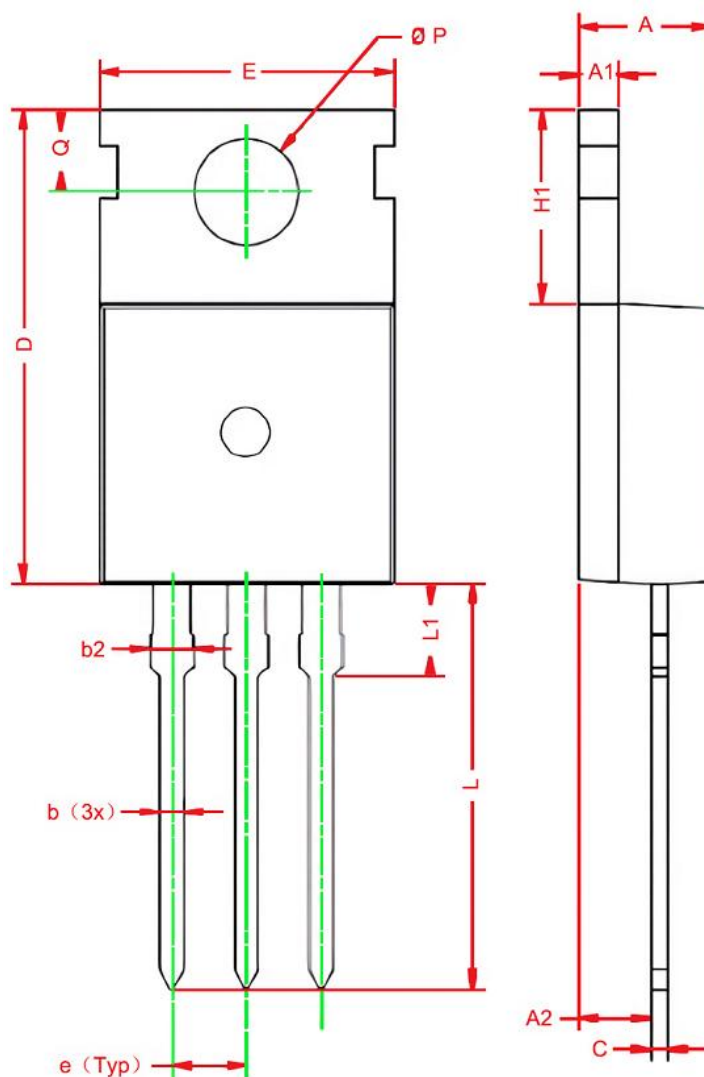
Typical Operating Characteristics



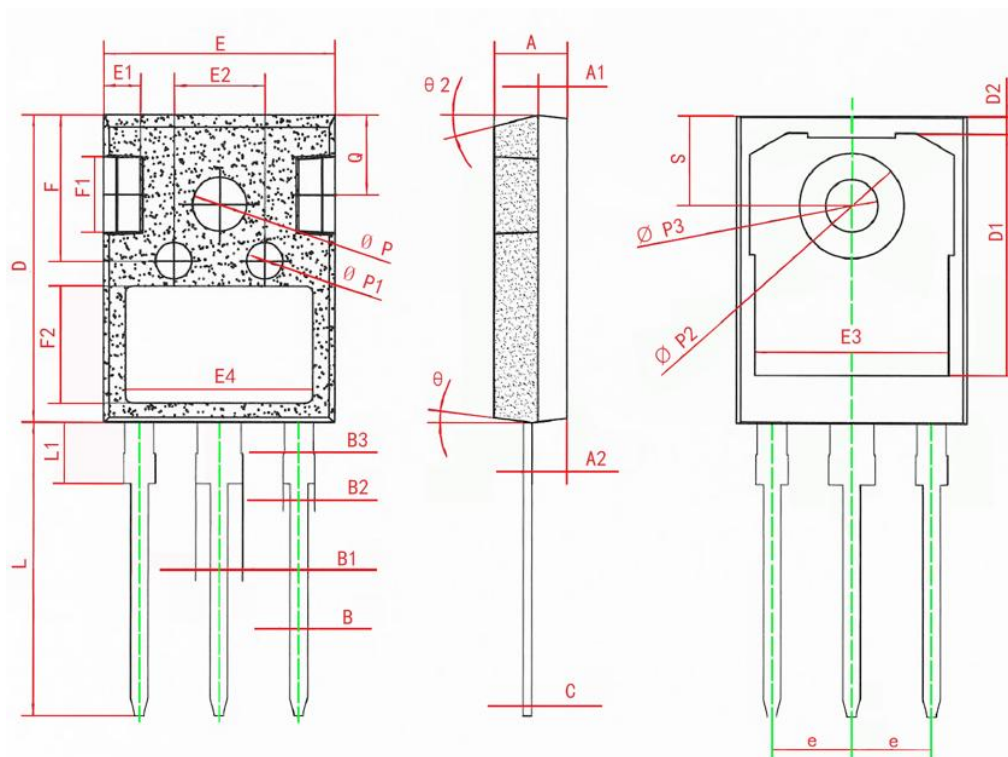
TO-252 Package information


Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.450	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.386	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
ϕ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

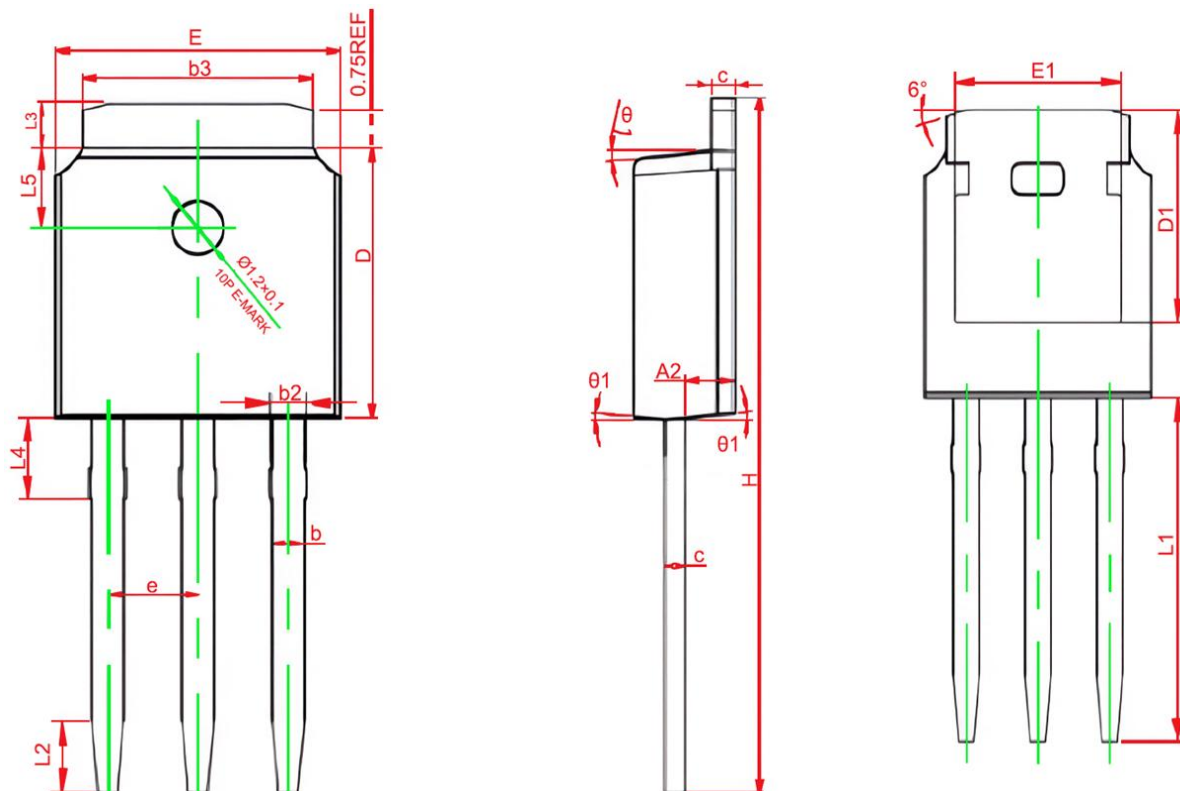
TO-220 Package information



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
$\varnothing P$	3.500	4.000	0.138	0.158
Q	2.540	3.400	0.100	0.134

TO-247 Package information


Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	4.900	5.100	0.192	0.200
A1	1.900	2.100	0.074	0.082
A2	2.300	2.500	0.090	0.098
B	1.140	1.240	0.044	0.048
B1	3.050	3.250	0.120	0.127
B2	2.000	2.200	0.078	0.086
B3	1.900	2.100	0.074	0.082
C	0.550	0.650	0.021	0.025
D	20.800	21.200	0.818	0.834
D1	16.350	16.750	0.643	0.659
D2	1.020	1.320	0.040	0.051
E	15.600	16.000	0.614	0.629
E1	2.400	2.600	0.094	0.102
E2	6.100	6.300	0.240	0.248
E3	13.060	13.460	0.514	0.529
E4	12.700	12.900	0.500	0.507
F	9.800	10.200	0.385	0.401
F1	4.800	5.400	0.188	0.212
F2	7.900	8.100	0.311	0.318
e	5.436BSC		0.214BSC	
L	19.720	20.120	0.776	0.792
L1	3.900	4.300	0.153	0.169
ØP	3.550	3.950	0.139	0.155
ØP1	2.400	2.600	0.094	0.102
ØP2	7.090	7.290	0.279	0.287
ØP3	3.500	3.700	0.137	0.145
S	6.050	6.250	0.238	0.246
Q	5.400	5.600	0.212	0.220
θ	5°	9°	5°	9°
θ1	5°	9°	5°	9°
θ2	13°	17°	13°	17°

TO-251 Package information


Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	2.200	2.380	0.087	0.094
A2	0.970	1.170	0.038	0.046
b	0.720	0.850	0.028	0.034
b2	0.720	0.950	0.028	0.038
b3	5.230	5.460	0.207	0.216
c	0.470	0.580	0.019	0.023
D	6.000	6.200	0.237	0.245
D1	5.300 REF		0.210 REF	
E	6.500	6.700	0.257	0.265
E1	4.700	4.920	0.186	0.195
e	2.286 REF.		0.114 REF.	
H	16.100	16.600	0.637	0.656
L1	9.200	9.600	0.364	0.380
L2	1.250	1.460	0.049	0.058
L3	0.900	1.220	0.036	0.048
L4	0.950	1.150	0.038	0.045
L5	1.700	1.900	0.067	0.075
θ 1	5°	7°	5°	7°