

Features

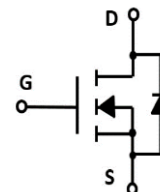
- Integrate fast recovery diode
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

Product Summary

V_{DS}	$R_{DS(ON)}$ TYP	I_D
200V	30mΩ@10V	50A

Application

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



Halogen-Free

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

Symbol	Parameter	Value	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)		TO-247	TO-3P
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	$T_C=25^{\circ}C$ 50	A
Mounted on Large Heat Sink			
I_{DM}	Pulse Drain Current Tested	$T_C=25^{\circ}C$ 200	A
I_D	Continuous Drain Current@GS=10V	$T_C=25^{\circ}C$ 50	A
P_D	Maximum Power Dissipation	$T_C=25^{\circ}C$ 250	W
E_{AS}	Single pulse avalanche energy ^(Notes1)	780	mJ

Ordering Information (Example)

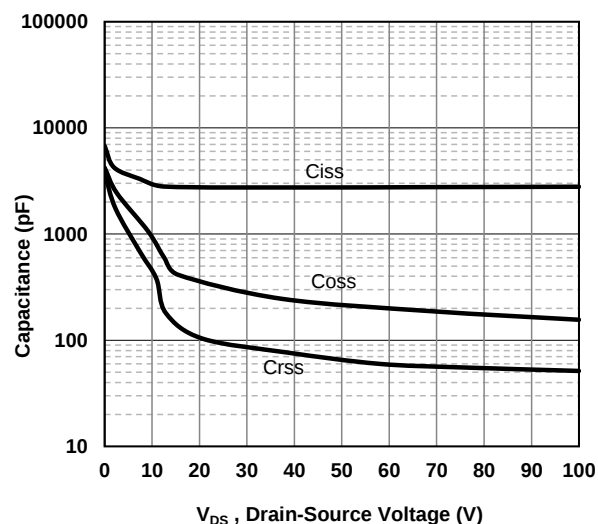
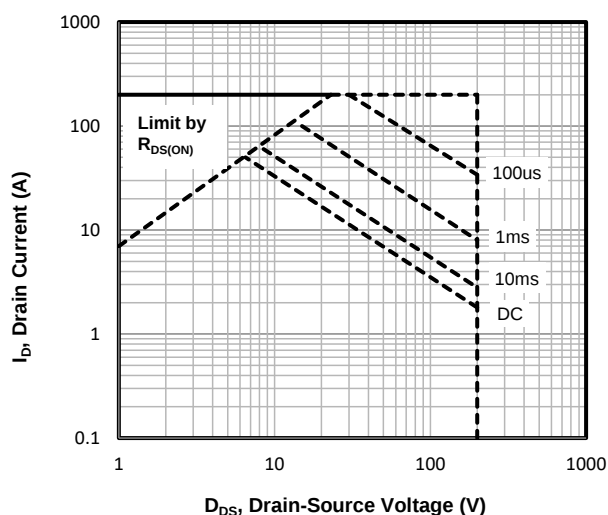
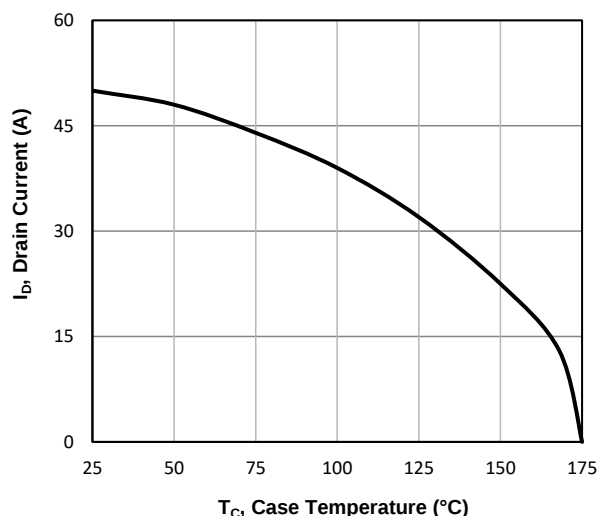
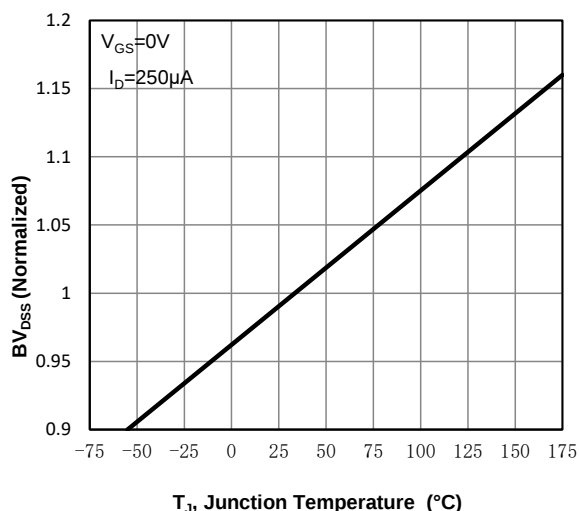
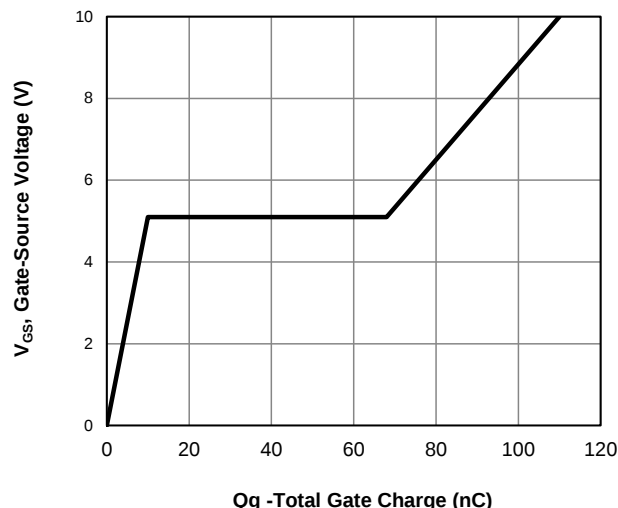
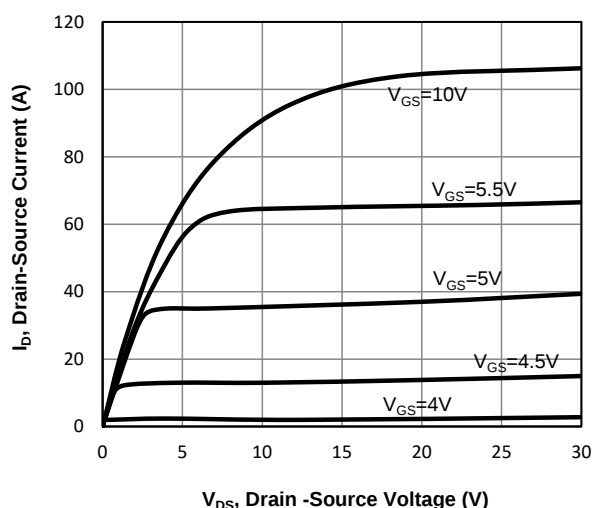
Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLSA50N20	TO-247-3L	MLSA50N20	30	270	2,160	/
MLSP50N20	TO-3P	MLSP50N20	30	270	2,160	/

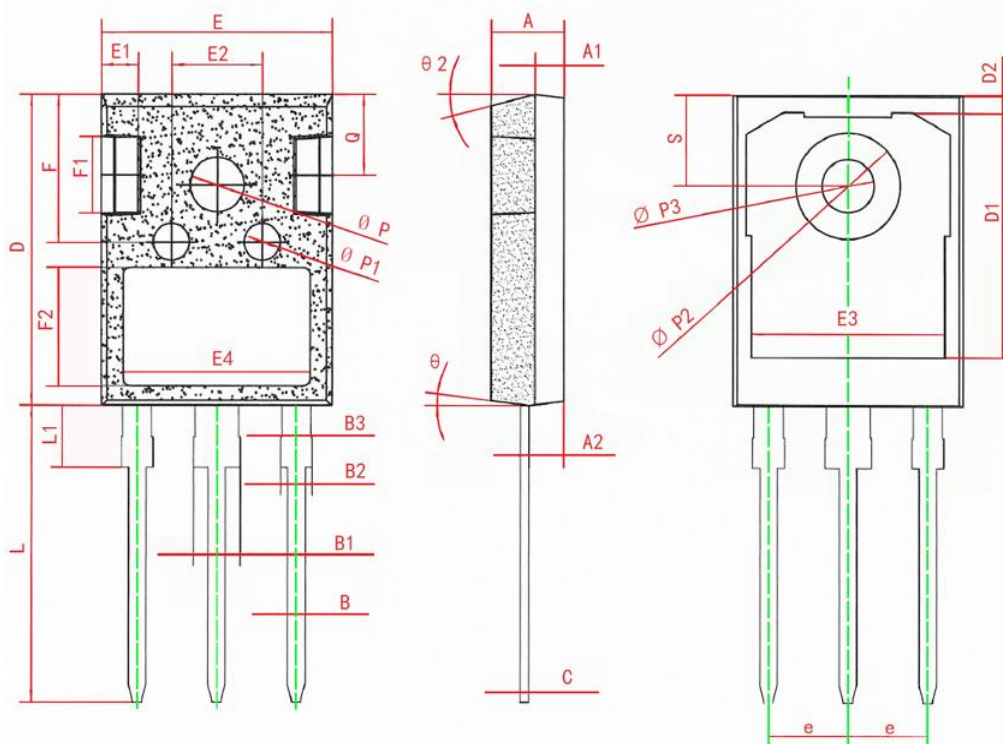
Electrical Characteristics (TJ=25°C unless otherwise noted)						
Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
BV _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	200	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =200V, V _{GS} =0V	--	--	1.0	μA
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 =25A	--	30	48	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	--	3538	--	pF
C _{OSS}	Output Capacitance		--	657	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	280	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DD} =160V, I _D =25A, V _{GS} =0 to 10V	--	244	--	nC
Q _{gs}	Gate Source Charge		--	16	--	nC
Q _{gd}	Gate Drain Charge		--	144	--	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =100V, I _D =25A, R _G =25Ω, V _{GS} =10V	--	53	--	nS
t _r	Turn-on Rise Time		--	65	--	nS
t _{d(off)}	Turn-Off Delay Time		--	689	--	nS
t _f	Turn-Off Fall Time		--	230	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	Tj=25°C, Is=25A,	--	--	1.5	V

Note:

1、I_{AS}=30A, V_{DD}=30V, R_G=25Ω, Starting T_J=25°C

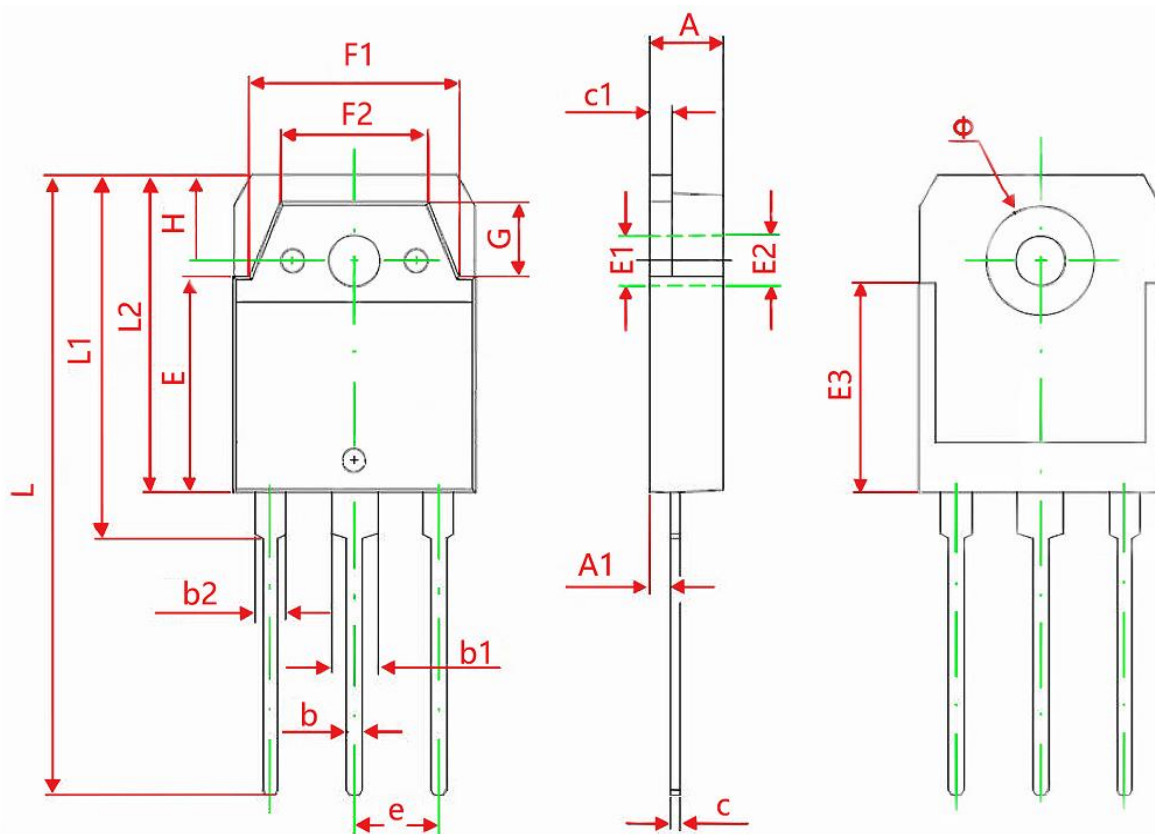
Typical Operating Characteristics



TO-247-3L 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
ΦP	3.550	3.950	0.139	0.155
ΦP1	2.400	2.600	0.094	0.102
ΦP2	7.090	7.290	0.279	0.287
ΦP3	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-3P Package information



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	4.600	5.000	0.181	0.196
A1	2.300	2.500	0.090	0.098
b	0.800	1.200	0.031	0.047
b1	2.800	3.200	0.110	0.125
b2	1.800	2.200	0.070	0.086
c	0.500	0.700	0.019	0.027
c1	1.450	1.650	0.057	0.064
D	15.450	15.850	0.608	0.624
E	13.700	14.100	0.539	0.555
E1	3.200REF		0.126REF	
E2	3.300REF		0.130REF	
E3	13.450REF		0.530REF	
F1	13.200	13.400	0.519	0.527
F2	9.400	9.800	0.370	0.385
L	39.780	39.980	1.566	1.574
L1	23.200	23.600	0.913	0.929
L2	19.780	19.980	0.778	0.786
Φ	6.900	7.100	0.271	0.279
G	5.150	5.550	0.203	0.219
e	5.450TYP		0.215TYP	
H	5.000REF		0.197REF	
h	0.000	0.300	0.000	0.011