

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
500V	280mΩ@10V	18A



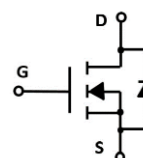
G D S
TO-220F



G D S
TO-220



G D S
TO-247-3L



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

Symbol	Parameter		Value			Unit
Common Ratings (TC=25°C Unless Otherwise Noted)			TO-220F	TO-220	TO-247-3L	
V _{DS}	Drain-Source Breakdown Voltage		500			V
V _{GS}	Gate-Source Voltage		±30			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	Tc=25°C	72		A
I_D	Continuous Drain Current@GS=10V	Tc=25°C	18		A
P_D	Maximum Power Dissipation	Tc=25°C	98	160	W
E_{AS}	Single pulse avalanche energy ^(Notes1)	980		mJ	

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MSY18N50	TO-220		50	1,000	5,000	/
MSYF18N50	TO-220F		50	1,000	5,000	/
MSA18N50	TO-247-3L		/	/	/	/

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	500	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =500V, V _{GS} =0V	--	--	1.0	uA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±30V, V _{DS} =0V	--	--	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	3.0	--	4.0	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =9A	--	280	340	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	--	2367	--	pF
C _{OSS}	Output Capacitance		--	228	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	15	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DD} =400V, I _D =18A, V _{GS} =10V	--	53.4	--	nC
Q _{gs}	Gate Source Charge		--	10	--	nC
Q _{gd}	Gate Drain Charge		--	20	--	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =250V, I _D =18A, R _G =25Ω	--	51.3	--	nS
t _r	Turn-on Rise Time		--	36.5	--	nS
t _{d(off)}	Turn-Off Delay Time		--	232	--	nS
t _f	Turn-Off Fall Time		--	61	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	Tj=25°C, Is=9A,	--	--	1.4	V

Note:

1、L=10mH, $V_{DD}=50V$, $R_G=25\Omega$, Starting $T_J=25^\circ C$

Typical Operating Characteristics

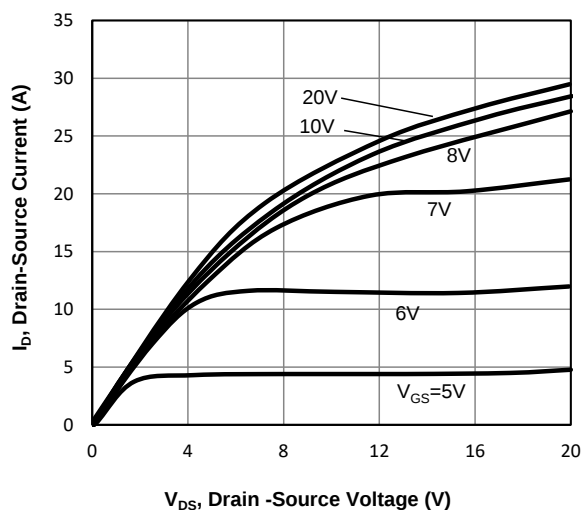


Fig1. Typical Output Characteristics

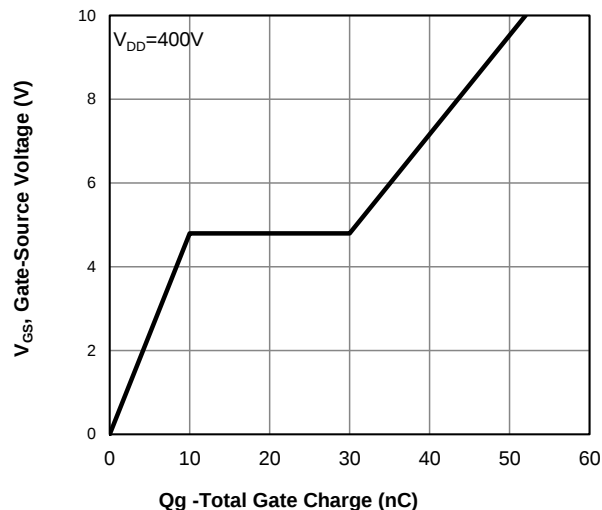


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

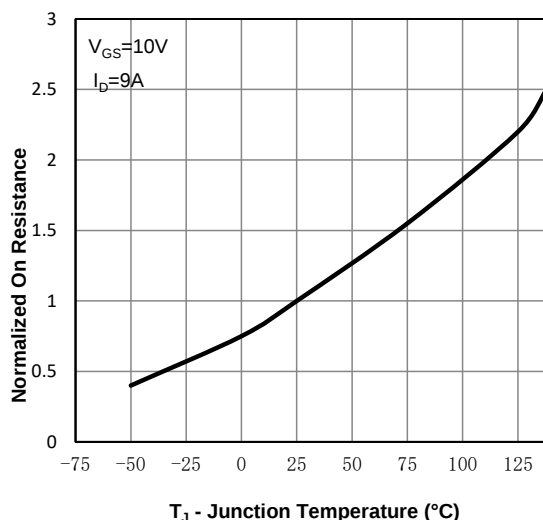


Fig3. Normalized On-Resistance Vs. Temperature

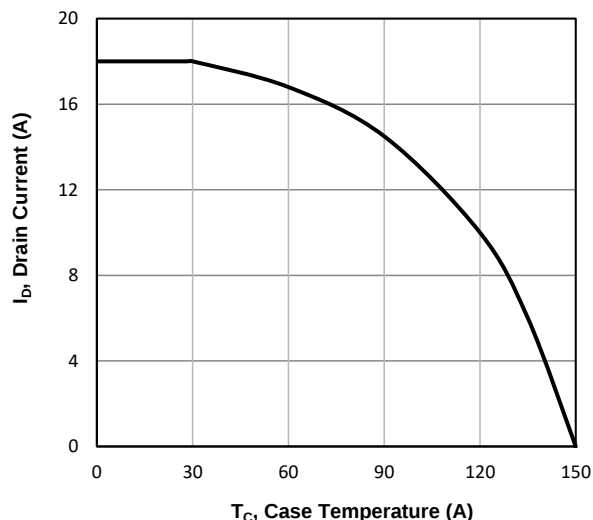


Fig4. Drain Current vs. Temperature

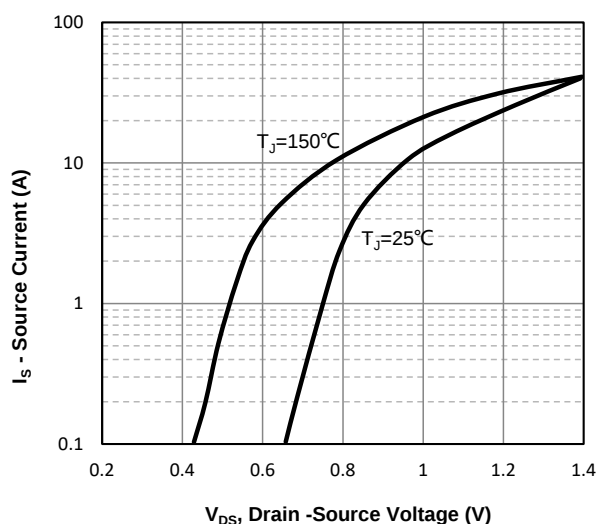


Fig5. Body Diode Forward Voltage

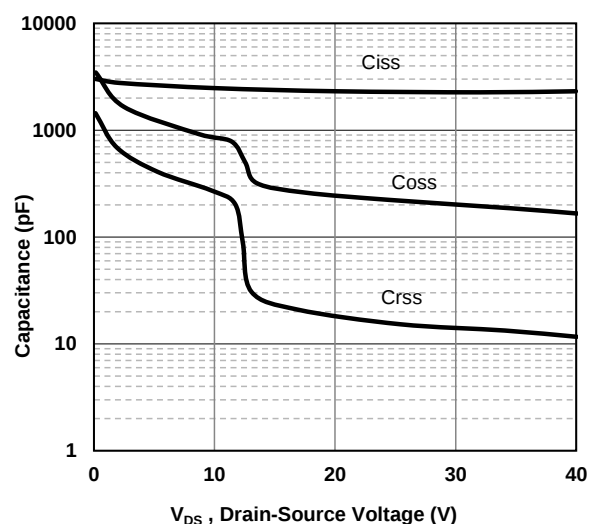
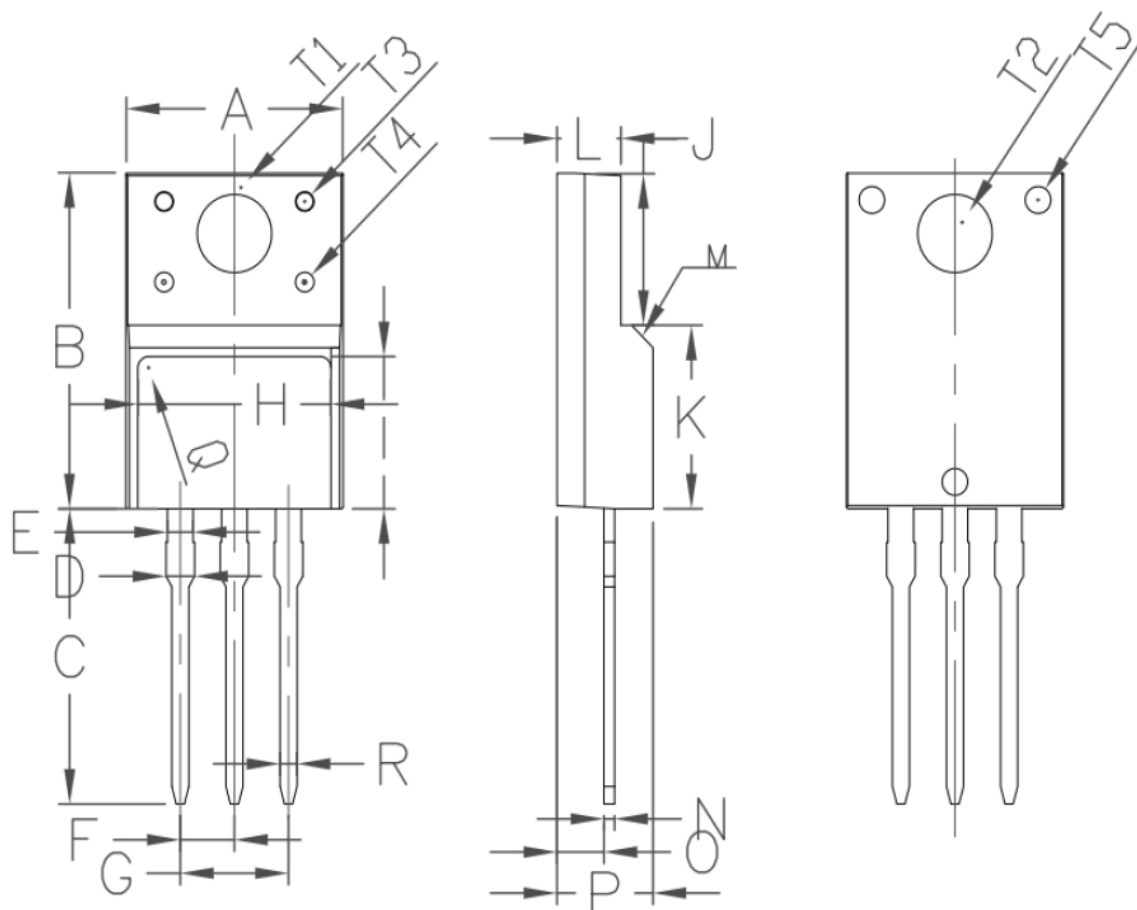
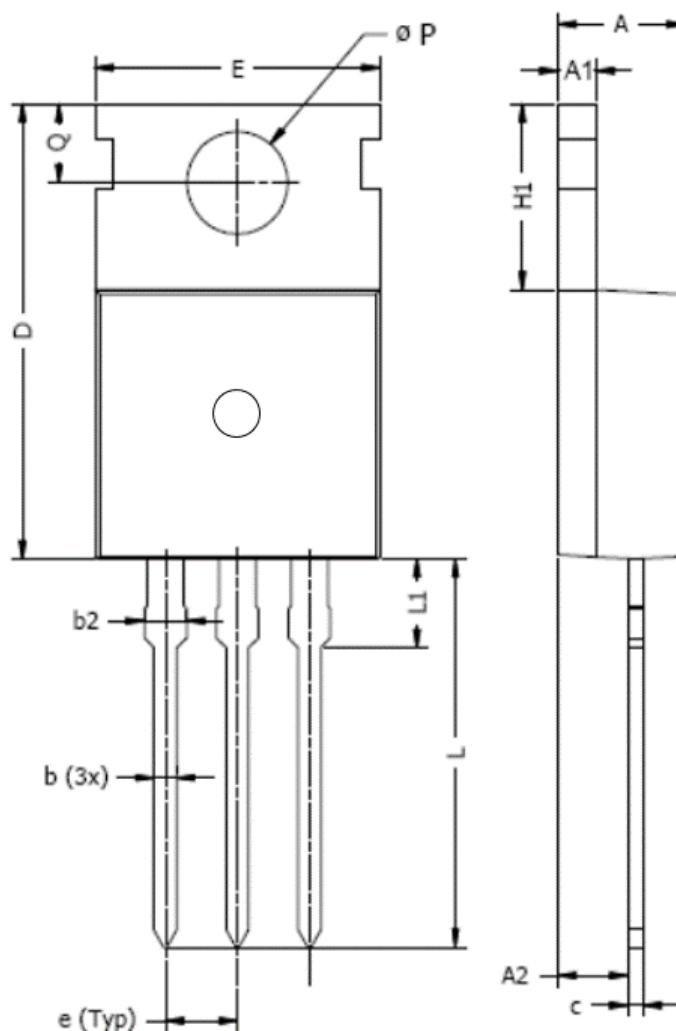


Fig6 Typical Capacitance Vs. Drain-Source Voltage

TO-220F Package information


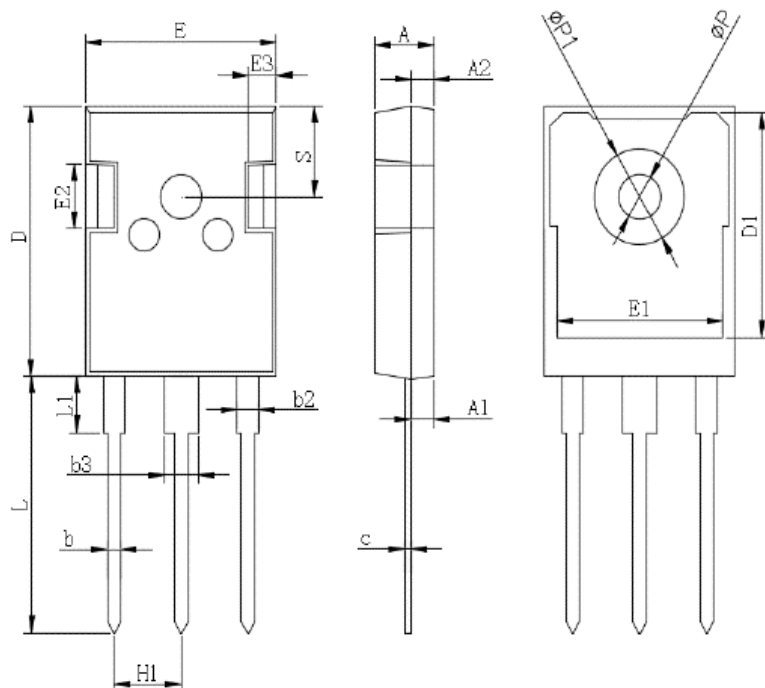
Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	9.960	10.360	0.392	0.407
B	15.670	16.070	0.616	0.632
C	13.140	13.540	0.517	0.533
D	1.200	1.400	0.047	0.055
E	1.200TYP		0.047TYP	
F	2.540TYP		0.100TYP	
G	5.080TYP		0.200TYP	
H	7.600	8.000	0.299	0.314
I	7.100	7.500	0.279	0.295
J	6.480	6.880	0.255	0.270
K	8.990	9.390	0.353	0.369
L	2.340	2.740	0.092	0.107
M	45°TYP		45°TYP	
N	0.490	0.520	0.019	0.020
O	2.150	2.550	0.084	0.100
P	4.500	4.900	0.177	0.192
Q	0.500TYP		0.019TYP	
S	4.5°TYP		4.5°TYP	
T1	3.450TYP		0.135TYP	
T2	3.180TYP		0.125TYP	
T3	1.500TYP		0.059TYP	
T4	1.200TYP		0.047TYP	
T5	1.500TYP		0.059TYP	
R	0.770	0.830	0.030	0.032

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
ϕP	3.500	4.000	0.138	0.158
Q	2.540	3.400	0.100	0.134

TO-247-3L Package information



Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	4.800	5.200	0.188	0.204
A1	2.210	2.610	0.087	0.102
A2	1.850	2.150	0.072	0.084
b	1.000	1.400	0.039	0.055
b2	1.910	2.210	0.075	0.087
C	0.500	0.700	0.019	0.027
D	20.700	21.300	0.814	0.838
D1	16.250	16.850	0.639	0.663
E	15.500	16.100	0.610	0.633
E1	13.000	13.600	0.511	0.535
E2	4.800	5.200	0.188	0.204
E3	2.300	2.700	0.090	0.106
L	19.620	20.220	0.772	0.796
L1	-	4.300	-	0.169
ØP	3.400	3.800	0.133	0.149
ØP1	-	7.300	-	0.287
S	6.15TYP		0.242TYP	
H1	5.44TYP		0.214TYP	
b3	2.800	3.200	0.110	0.125