

Features

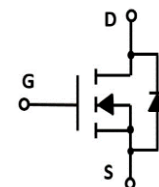
- Integrate fast recovery diode
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

Application

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

Product Summary

V_{DS}	$R_{DS(ON)}$ TYP	I_D
650V	900mΩ@10V	8A



Halogen-Free

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

Symbol	Parameter	Value	Unit
Common Ratings (TC=25°C Unless Otherwise Noted)		TO-220	TO-220F
V_{DS}	Drain-Source Breakdown Voltage	650	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	$T_C=25^{\circ}C$	8

Mounted on Large Heat Sink

I_{DM}	Pulse Drain Current Tested	$T_C=25^{\circ}C$	32	A
I_D	Continuous Drain Current@GS=10V	$T_C=25^{\circ}C$	8	A
P_D	Maximum Power Dissipation	$T_C=25^{\circ}C$	104	62.5
E_{AS}	Single pulse avalanche energy ^(Notes1)		432	mJ

Ordering Information (Example)

Type	Package	Marking	Minimum Package(pcs)	Inner Box Quantity(pcs)	Outer Carton Quantity(pcs)	Delivery Mode
MLSY8N65	TO-220		50	1,000	5,000	/
MLSYF8N65	TO-220F		50	1,000	5,000	/

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	650	--	--	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =650V, V _{GS} =0V	--	--	1	μA
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	2.5	--	4.5	V
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =5A	--	900	1100	mΩ
Dynamic Electrical Characteristics @ TJ = 25°C (unless otherwise stated)						
C _{ISS}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	--	1602	--	pF
C _{OSS}	Output Capacitance		--	102	--	pF
C _{RSS}	Reverse Transfer Capacitance		--	67	--	pF
Switching Characteristics						
Q _g	Total Gate Charge	V _{DD} =520V, I _D =10A, V _{GS} =10V	--	29.3	--	nC
Q _{gs}	Gate Source Charge		--	7.1	--	nC
Q _{gd}	Gate Drain Charge		--	6.8	--	nC
t _{d(on)}	Turn-on Delay Time	V _{DD} =325V, I _D =10A, R _G =10Ω	--	17	--	nS
t _r	Turn-on Rise Time		--	1.8	--	nS
t _{d(off)}	Turn-Off Delay Time		--	17	--	nS
t _f	Turn-Off Fall Time		--	1.8	--	nS
Source- Drain Diode Characteristics						
V _{SD}	Forward on voltage	Tj=25°C, Is=8A,	--	--	1.5	V

Note:

1、L=10mH, V_{DD}=50V, R_G=25Ω, Starting T_J=25°C

Typical Operating Characteristics

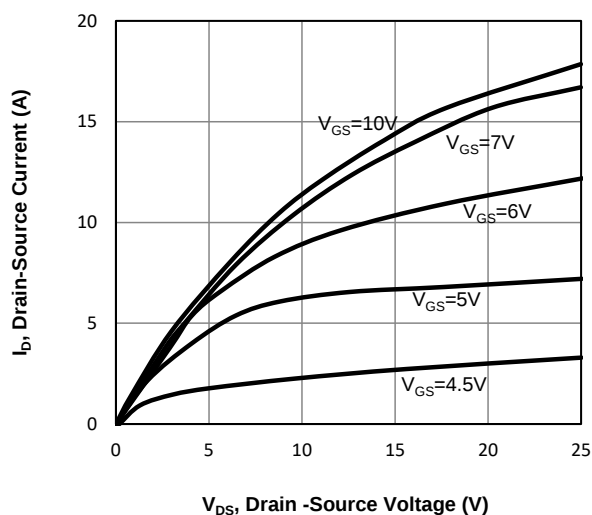


Fig1. Typical Output Characteristics

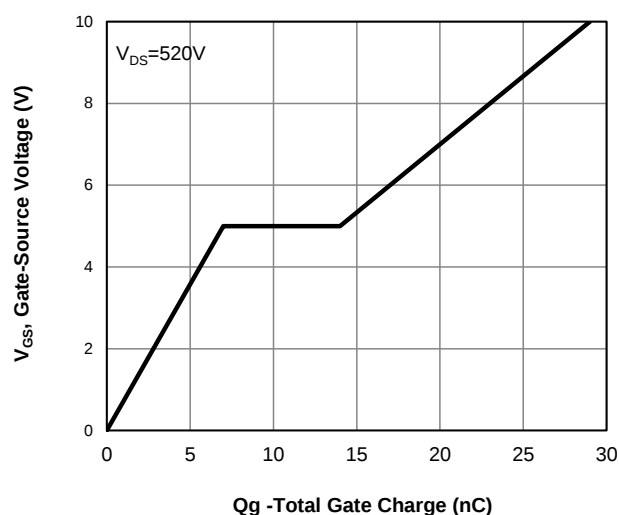


Fig2. Typical Gate Charge Vs. Gate-Source Voltage

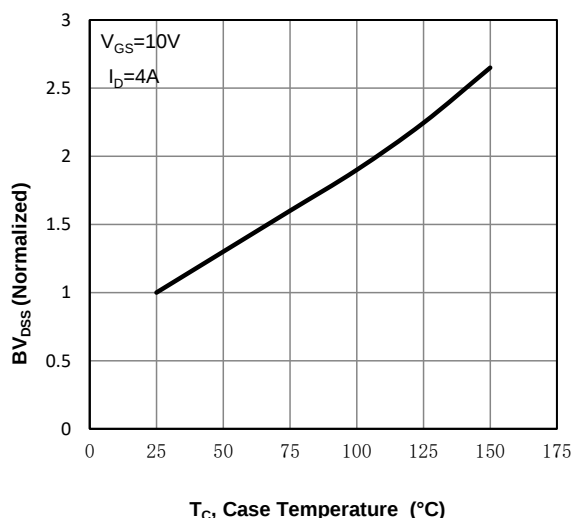


Fig3. BV_{DSS} Variation vs. Temperature

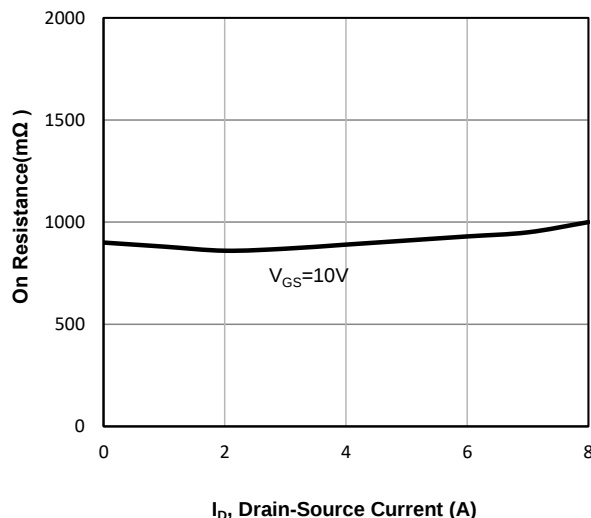


Fig4. On-Resistance Vs. Drain-Source Current

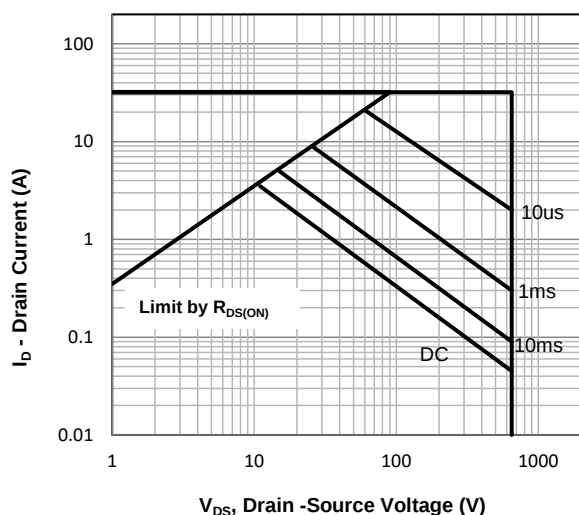


Fig5. Maximum Safe Operating Area

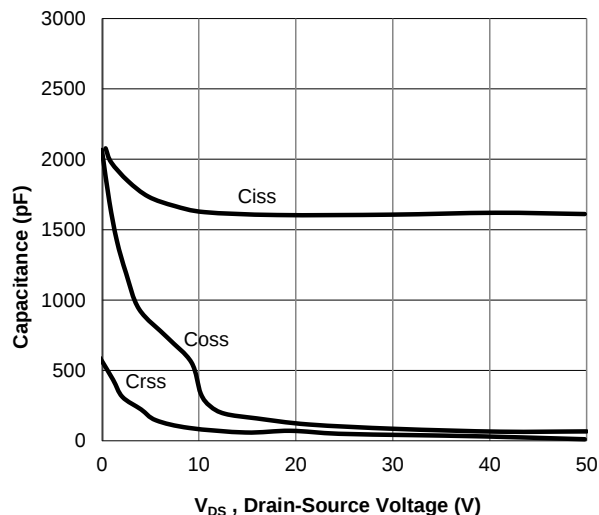
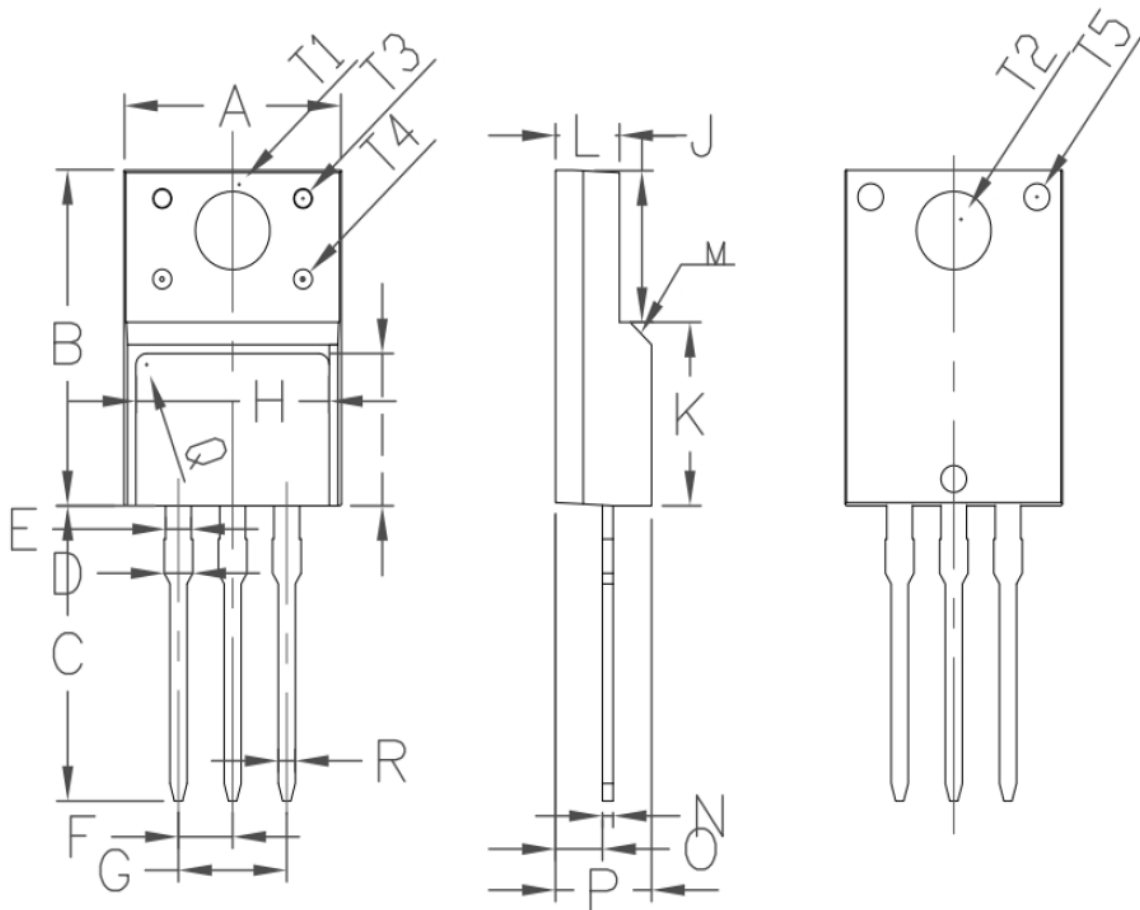
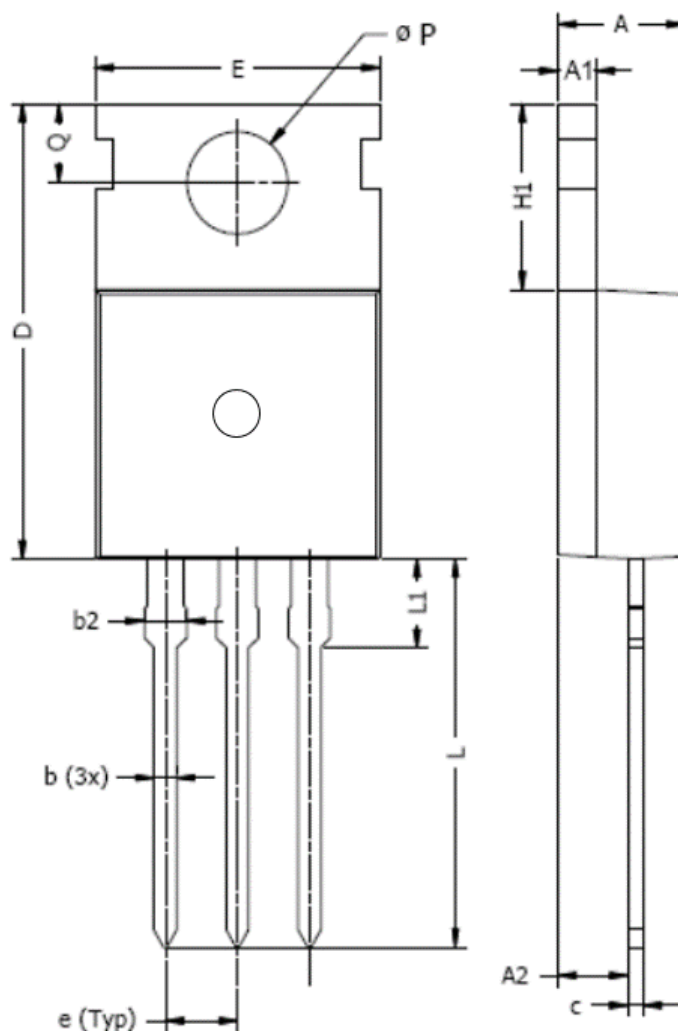


Fig6. Typical Capacitance Vs. Drain-Source Voltage

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