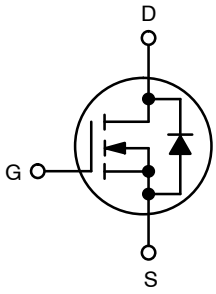
MOSFET – N-Channel, Field Effect Transistor, Enhancement Mode, Logic Level

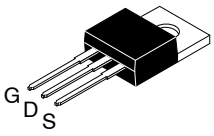
60 V, 12 A, 0.18 Ω

MTP3055VL

V_{DSS}	$R_{DS(ON)}$ MAX	I_D MAX
60 V	0.18 Ω @ 5 V	12 A



N-CHANNEL MOSFET



TO-220-3LD
CASE 340AT

General Description

This N-Channel Logic Level MOSFET has been designed specifically for low voltage, high speed switching applications i.e. power supplies and power motor controls.

This MOSFET features faster switching and lower gate charge than other MOSFETs with comparable $R_{DS(ON)}$ specifications.

The result is a MOSFET that is easy and safer to drive (even at very high frequencies).

Features

- 12 A, 60 V. $R_{DS(ON)}$ = 18 Ω @ V_{GS} = 5 V
- Critical DC Electrical Parameters Specified at Elevated Temperature
- Low Drive Requirements Allowing Operation Directly from Logic Drivers. Vgs(th) < 2 V
- Rugged Internal Source-Drain Diode Can Eliminate the Need for an External Zener Diode Transient Suppressor
- 175 °C Maximum Junction Temperature Rating
- This is a Pb-Free and Halide Free Device

MARKING DIAGRAM



MTP3055VL = Specific Device Code
A = Assembly Location
YWW = Date Code (Year & Week)
ZZ = Assembly Lot

MAXIMUM RATINGS (T_C = 25 °C unless otherwise noted)

Symbol	Rating		Value	Unit
V_{DSS}	Drain-Source Voltage		60	V
V_{GSS}	Drain-Source Voltage		±15	V
I_D	Drain Current	– Continuous	12	A
		– Pulsed	42	A
P_D	Power Dissipation	@ T_C = 25 °C	48	W
		Derate above 25 °C	0.32	W/°C
T_J,T_{STG}	Operating and Storage Junction Temperature Range		–65 to +175	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

Symbol	Rating	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	3.13	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 1)	62.5	°C/W

1. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance.

ORDERING INFORMATION

Device	Package	Shipping
MTP3055VL	TO-220-3LD	800 Units / Tube

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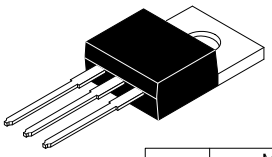
ELECTRICAL CHARACTERISTICS (T_C = 25 °C unless otherwise specified)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE AVALANCHE RATINGS (Note 2)						
W_{DSS}	Single Pulse Drain-Source Avalanche Energy	V_{DD} = 25 V, I_D = 12 A	–	–	72	mJ
I_{AR}	Maximum Drain-Source Avalanche Current		–	–	12	A
OFF CHARACTERISTICS						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250 μA	60	–	–	V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I_D = 250 μA, Referenced to 25 °C	–	55	–	mV/°C
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 60 V, V_{GS} = 0 V	–	–	10	μA
		V_{DS} = 60 V, V_{GS} = 0 V, T_J = 150 °C	–	–	100	
I_{GSSF}	Gate-Body Leakage Current, Forward	V_{GS} = 15 V, V_{DS} = 0 V	–	–	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	V_{GS} = −15 V, V_{DS} = 0 V	–	–	−100	nA
ON CHARACTERISTICS (Note 2)						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250 μA	1	1.6	2	V
$\frac{\Delta V_{GS(th)}}{\Delta T_j}$	Gate Threshold Voltage Temperature Coefficient	I_D = 250 μA, Referenced to 25 °C	–	−4	–	mV/°C
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS} = 5 V, I_D = 6 A	–	0.100	0.180	Ω
$V_{DS(on)}$	Drain-Source On-Voltage On-Resistance	V_{GS} = 5 V, I_D = 12 A	–	–	2.6	V
g_{FS}	Forward Transconductance	V_{DS} = 8 V, I_D = 6 A	5	8.7	–	S
DYNAMIC CHARACTERISTICS						
C_{iss}	Input Capacitance	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz	–	345	570	pF
C_{oss}	Output Capacitance		–	110	160	pF
C_{rss}	Reverse Transfer Capacitance		–	30	40	pF
SWITCHING CHARACTERISTICS (Note 2)						
$t_{D(on)}$	Turn-On Delay Time	V_{DD} = 30 V, I_D = 12 A, V_{GS} = 5 V, R_{GEN} = 9.1 Ω	–	–	20	ns
t_r	Turn-On Rise Time		–	–	190	ns
$t_{D(off)}$	Turn-Off Delay Time		–	–	30	ns
tf	Turn-Off Fall Time		–	–	90	ns
Q_g	Total Gate Charge	V_{DS} = 48 V, I_D = 12 A, V_{GS} = 5 V	–	7.8	10	nC
Q_{gs}	Gate-Source Charge		–	1.7	–	nC
Q_{gd}	Gate-Drain Charge		–	3.2	–	nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
I_S	Maximum Continuous Drain-Source Diode Forward Current (Note 2)		–	–	12	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current (Note 2)		–	–	42	A
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS} = 0 V, I_S = 12 A (Note 2)	–	–	1.3	V
t_{rr}	Drain-Source Reverse Recovery Time	I_F = 12 A, di/dt = 100 A/μs	–	55	–	ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

2. Pulse Test: pulse width ≤ 300 μs, duty cycle ≤ 2.0%.

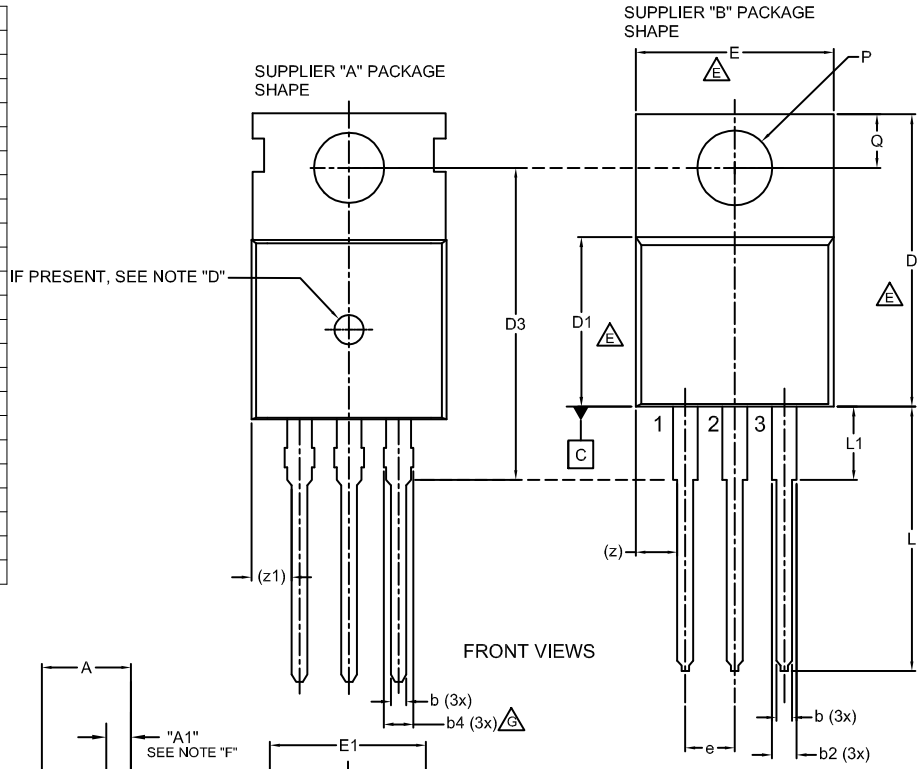
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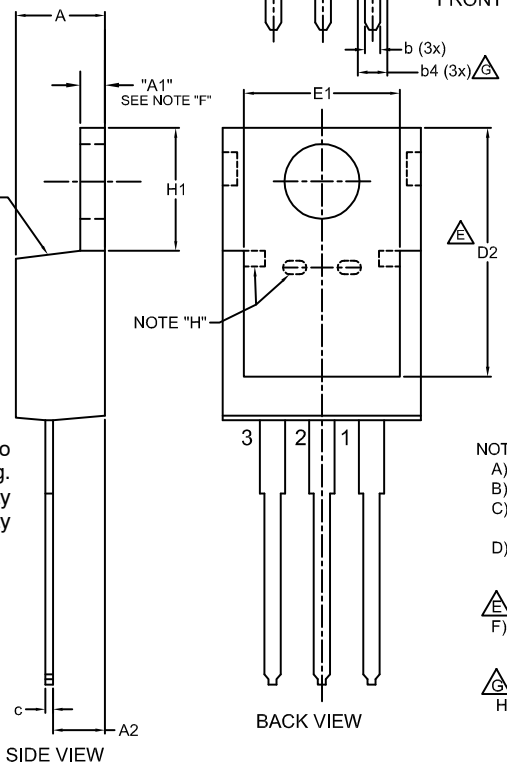


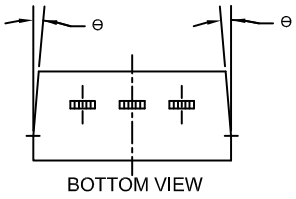
TO−220−3LD
CASE 340AT
ISSUE B

DATE 08 AUG 2022

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	4.00	--	4.70
A1	SEE NOTE "F"		
A2	2.10	--	2.85
b	0.55	--	1.00
b2	1.10	--	1.62
b4	1.42	--	1.62
c	0.36	--	0.60
D	13.90	--	16.30
D1	8.13	--	9.40
D2	11.50	--	14.30
D3	15.42	--	16.51
E	9.65	--	10.67
E1	7.59	--	8.65
e	2.40	--	2.67
H1	6.06	--	6.69
L	12.70	--	14.04
L1	2.70	--	4.10
P	3.50	--	4.00
Q	2.50	--	3.40
z	2.13 REF		
z1	2.06 REF		
Θ	3°	–	5°







GENERIC MARKING DIAGRAM*



XXXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
ZZ = Assembly Lot Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

NOTES:
A) REFERENCE JEDEC, TO-220, VARIATION AB
B) ALL DIMENSIONS ARE IN MILLIMETERS.
C) DIMENSIONS COMMON TO ALL PACKAGE SUPPLIERS EXCEPT WHERE NOTED [ ].
D) LOCATION OF MOLDED FEATURE MAY VARY (LOWER LEFT CORNER, LOWER CENTER AND CENTER OF THE PACKAGE)
E) DOES NOT COMPLY JEDEC STANDARD VALUE.
F) "A1" DIMENSIONS AS BELOW:
SINGLE GAUGE = 0.51 - 0.61
DUAL GAUGE = 1.10 - 1.45
G) PRESENCE IS SUPPLIER DEPENDENT
H) SUPPLIER DEPENDENT MOLD LOCKING HOLES IN HEATSINK.

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DESCRIPTION:	**TO−220−3LD**	**PAGE 1 OF 1**

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