

MD3DFN3 3A Full Bridge Rectifier

GENERAL DESCRIPTION

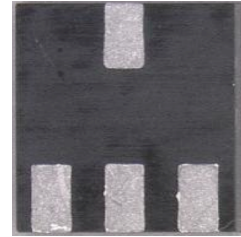
Dual 20 V N-Channel with 3.5 A Schottky Barrier Diode, 4.0 x 4.0 x 0.5 mm DFN Package

FEATURES

- Full-Bridge Rectifier Block
- Up to 3.2 A operation
- Low RDS(on) MOSFET to minimize conduction loss
- Low gate charge MOSFET
- Low VF Schottky diode
- Ultra Low Inductance Package

APPLICATIONS

- Wireless Charging
- AC-DC Rectification
- Optimized for Power Management Applications for Portable Products, such as Cell Phones, PMP, DSC, GPS, and others



RoHS
COMPLIANT

HALOGEN
FREE
Available

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	VDS	700	V
Continuous Drain Current @ TC=25°C	ID	10	A
Continuous Drain Current @ TC=100°C	ID	6.0	A
Pulsed Drain Current	IDM	40	A
Gate-Source Voltage	VGS	±30	V
Single Pulsed Avalanche Energy	EAS	658	mJ
Avalanche Current	IAR	10	A
Repetitive Avalanche Energy	EAR	17.8	mJ
Peak Diode Recovery dV/dt	dV/dt	4.5	V/ns
Power Dissipation (TC=25°C)	PD	35	W
Power Dissipation (TC=100°C)		0.30	W
Operating Junction and Storage Temperature	Tj, Tstg	-55~+150	°C

NOTE:

1. Repeativity rating : pulse width limited by junction temperature
2. L = 15mH, IAS =9.0A, VDD = 50V, RG = 25Ω , Starting TJ = 25°C
3. ISD ≤ 9.0A, di/dt ≤ 200A/us, VDD ≤ BVDSS, Starting TJ = 25°C
4. Pulse Test : Pulse Width ≤ 300us, Duty Cycle ≤ 2%
5. Essentially independent of operating temperature.



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Characteristics (Tc=25°C, unless otherwise specified)

Symbol	Test Conditions	Min.	Typ.	Max.	Unit
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Static Characteristics

VGS	VDS = VGS, ID=250μA	2.5	-	4.5	V
*RDS(ON)	VGS =10V, ID =4.75A	-	0.8	1.0	mΩ
BVDSS	VGS=0, ID=250μA	700	-	-	V
ΔBVDSS/ΔTj	Reference to 25°C, ID=250μA		0.60		
IDSS	VDS =700V, VGS =0V	-	-	1	uA
	VDS =560V, VGS =0, Tj=125°C	-	-	10	
IGSSF	VGS =30V, VDS =0V	-	-	100	nA
IGSSR	VGS =-30V, VDS =0V	-	-	-100	nA

Dynamic Characteristics

Ciss	VGS=0V, VDS=25V, f=1MHz	-	1650	2050	pF
Coss		-	165	217	
Crss		-	18	25	
td(ON)	VDS =325V, ID =10A, RG = 25 Ω	-	25	55	ns
tr		-	70	150	
td(OFF)		-	140	300	
tf		-	80	165	
Qg	VDS =520V, ID =10A, VGS =10V	-	48	58	nC
Qgs		-	7.0	-	
Qgd		-	18.0	-	

Source-Drain Diode Characteristics

IS		-	-	10	A
ISM		-	-	40	
VSD	IS = 10A, VGS = 0 V	-	-	1.4	V
trr	IS = 10 A, VGS = 0 V diF/dt = 100 A/μs	-	430	-	nS
Qrr		-	4.3	-	nC

- Characteristic Curves

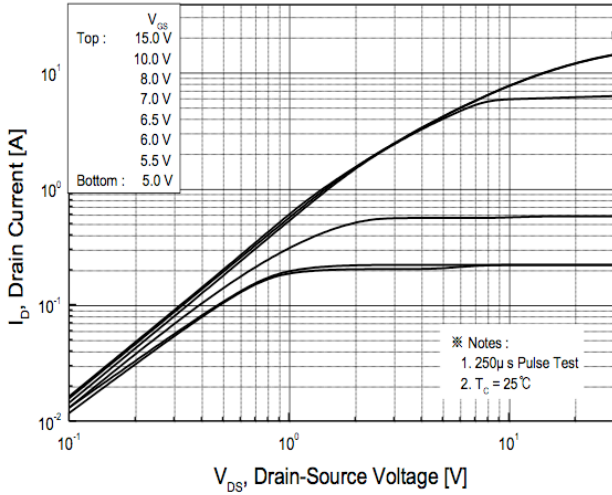


Figure 1. On Region Characteristics

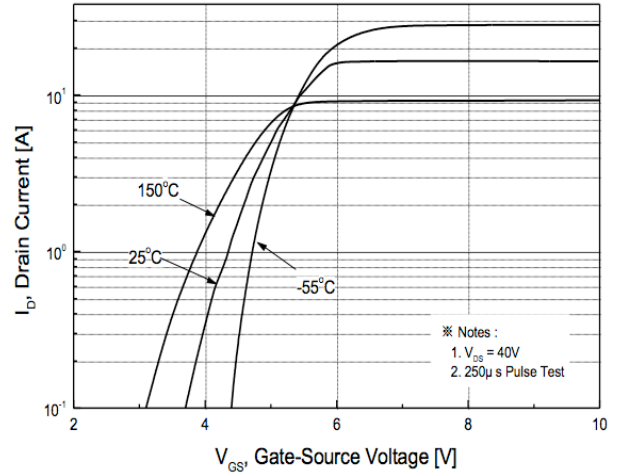


Figure 2. Transfer Characteristics

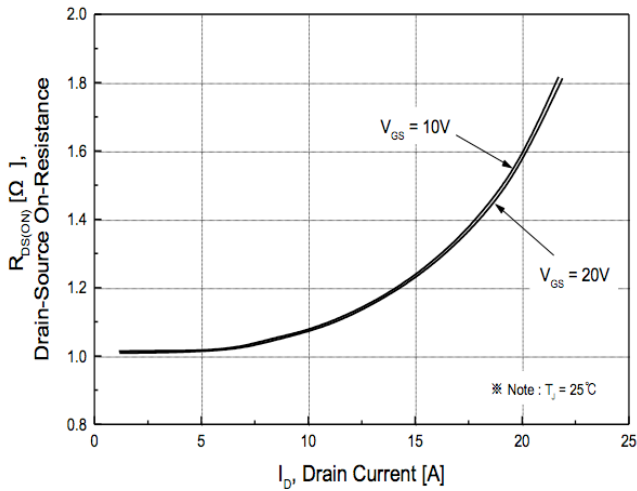


Figure 3. On Resistance Variation vs Drain Current and Gate Voltage

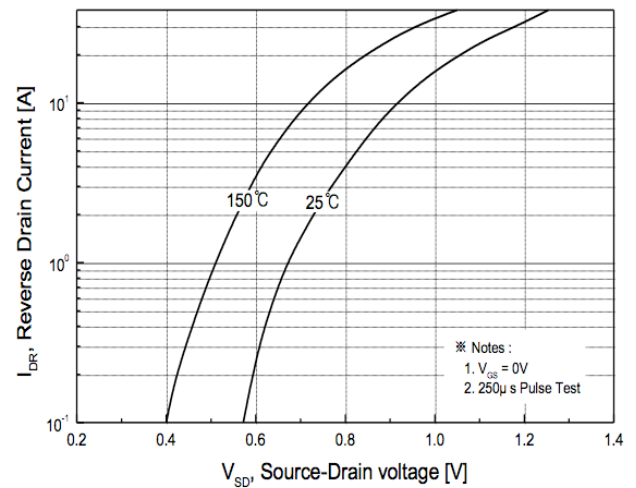


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

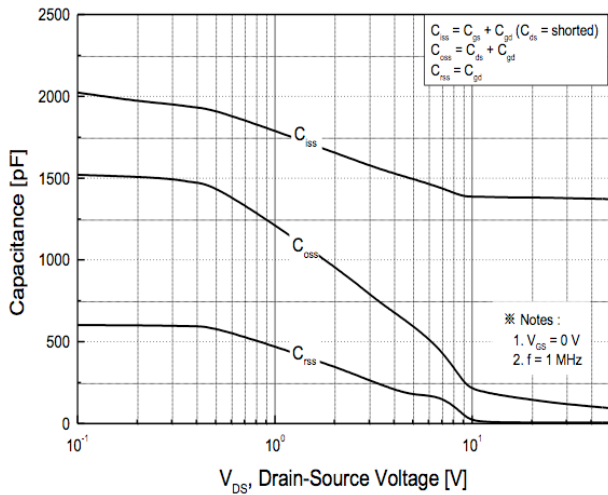


Figure 5. Capacitance Characteristics

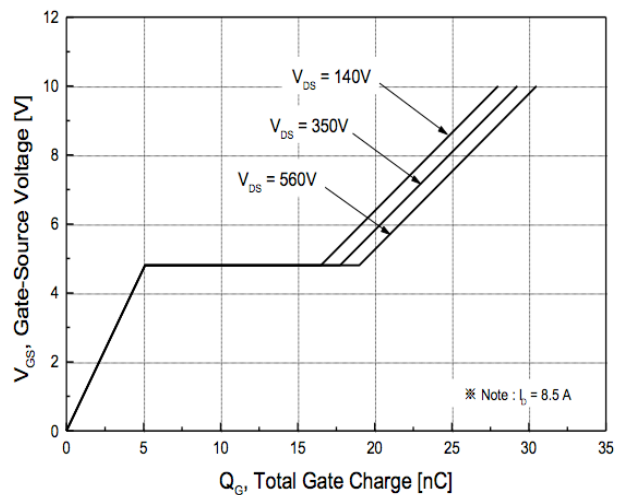


Figure 6. Gate Charge Characteristics

• Characteristic Curves

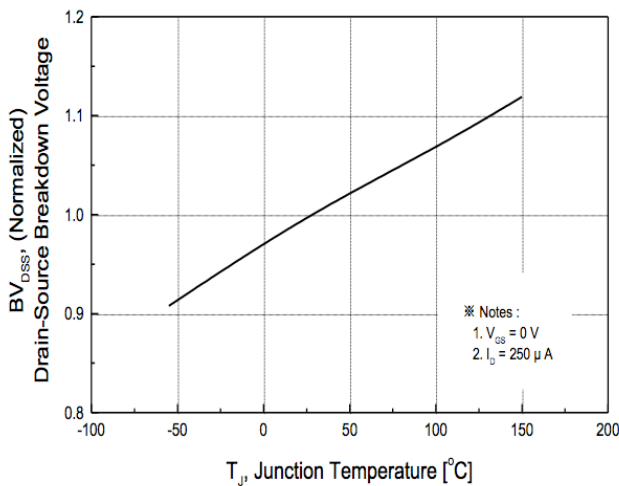


Figure 7. Breakdown Voltage Variation vs. Temperature

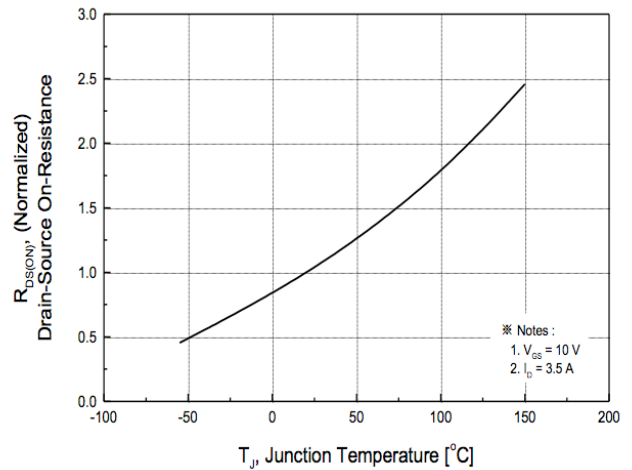


Figure 8. On-Resistance Variation vs. Temperature

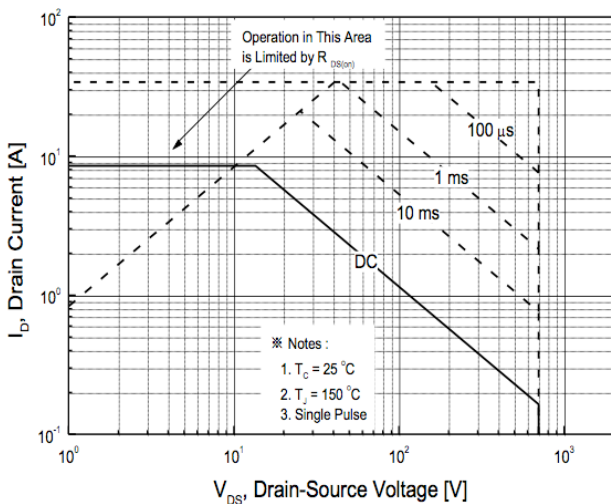


Figure 9. Maximum Safe Operating Area

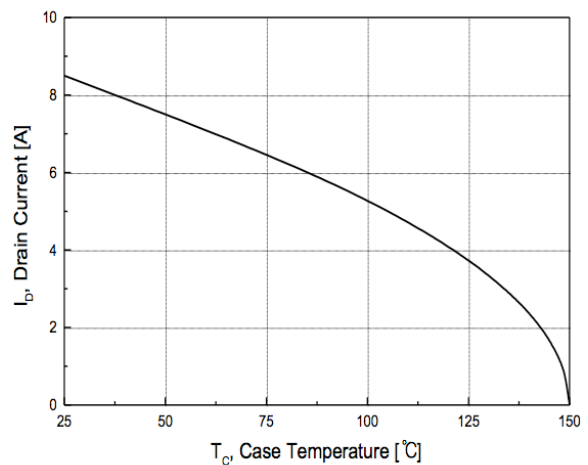


Figure 10. Maximum Drain Current vs. Case Temperature

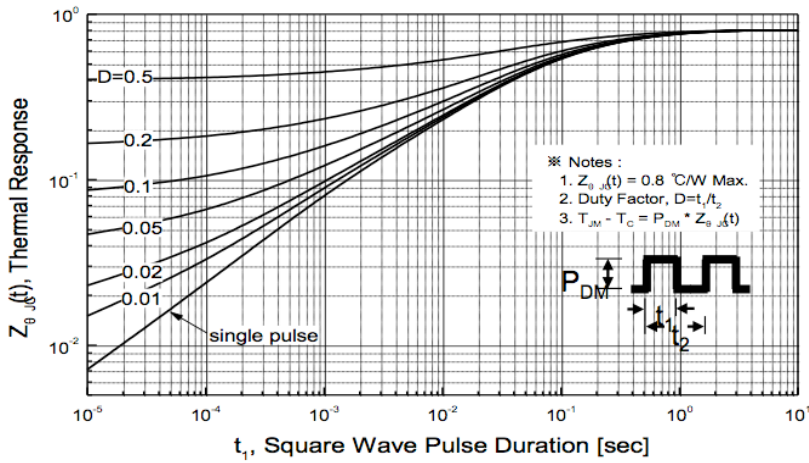


Figure 11. Transient Thermal Response Curve

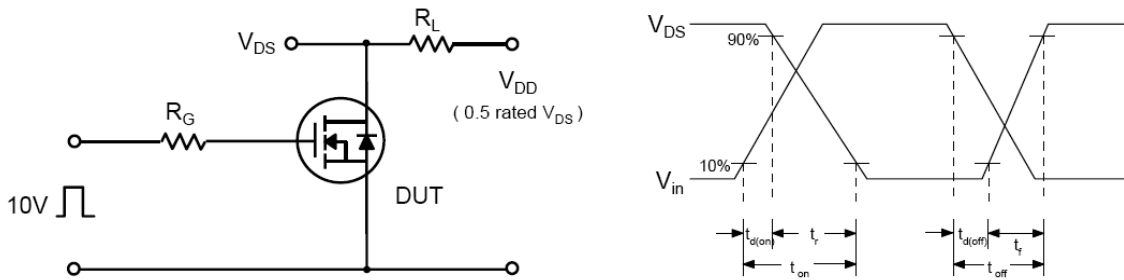


Fig 12. Resistive Switching Test Circuit & Waveforms

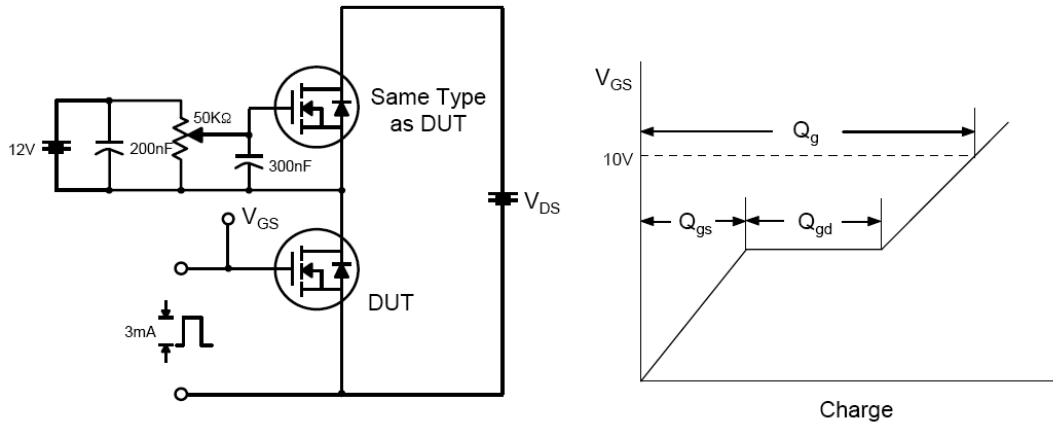


Fig 13. Gate Charge Test Circuit & Waveform

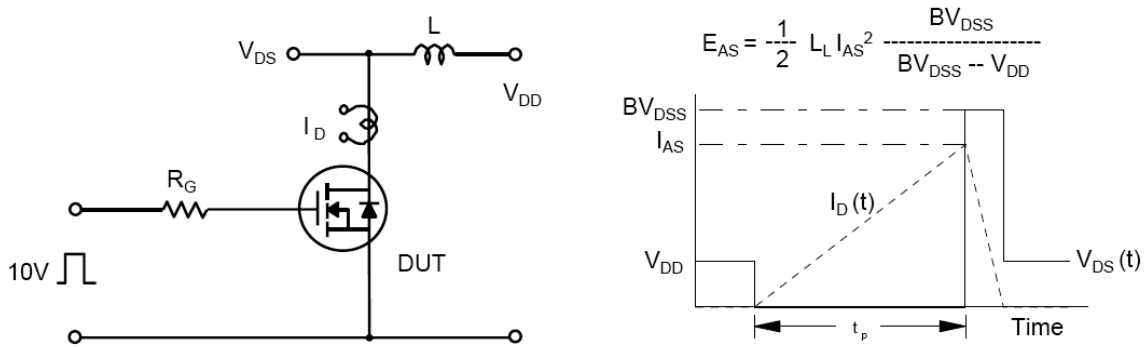


Fig 14. Unclamped Inductive Switching Test Circuit & Waveforms

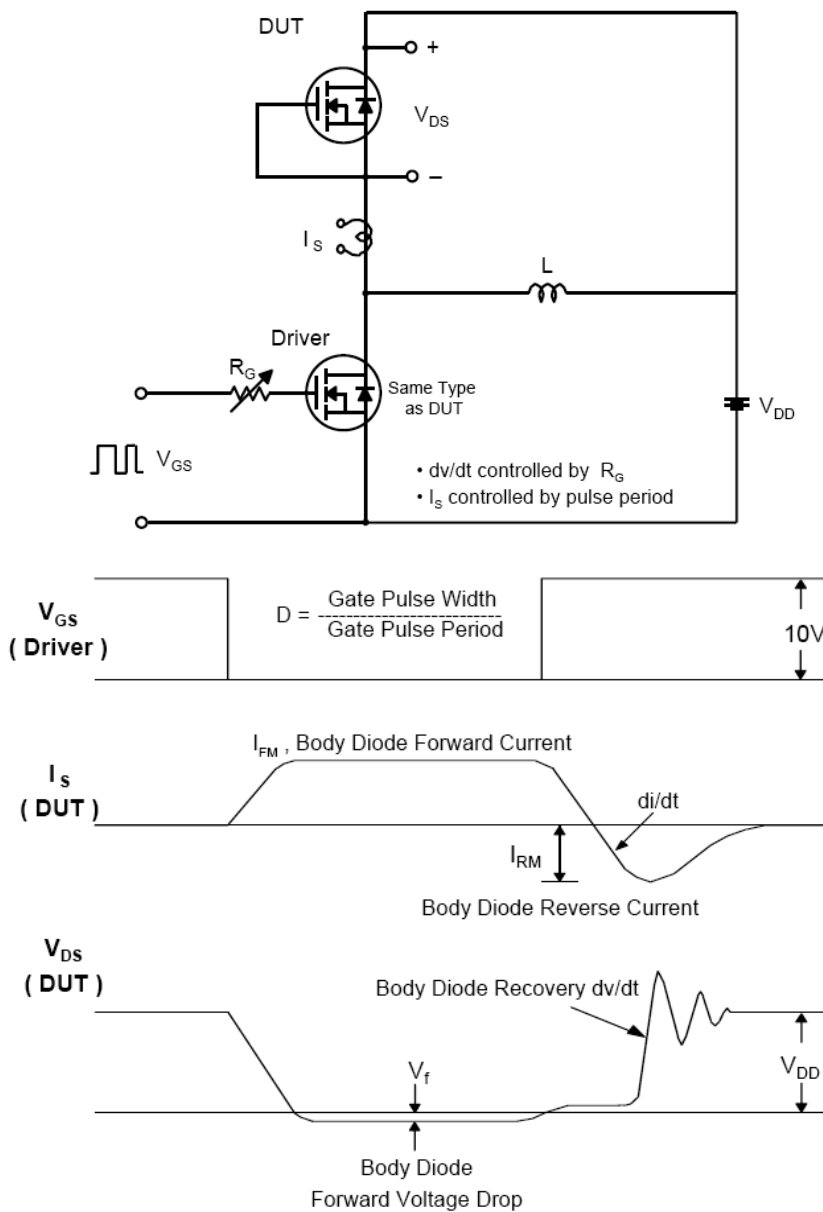


Fig 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms

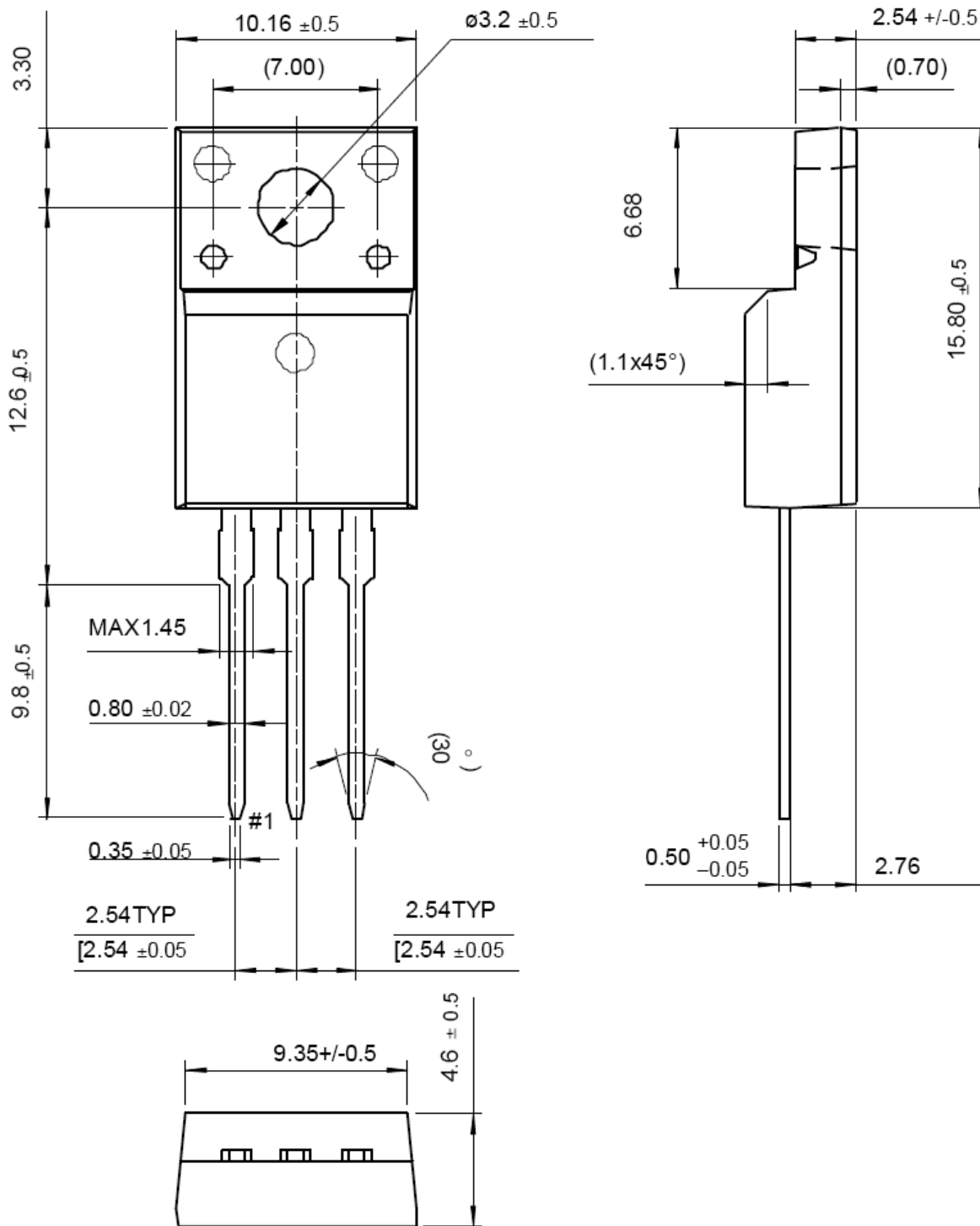


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Package Dimensions

Dimensions in Millimeters

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