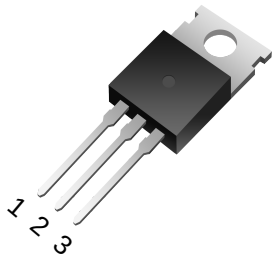
WGP50P10

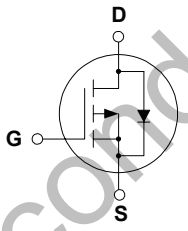
Features:

- ☐ Low Intrinsic Capacitances.
- ☐ Excellent Switching Characteristics.
- ☐ Extended Safe Operating Area.
- ☐ Unrivalled Gate Charge :Qg= 102nC (Typ.)
- ☐ BVDSS=-100V,I_D=- 50A
- ☐ R_{DS}(on) : 37m Ω (Max) @V_G=10V
- ☐ 100% Avalanche Tested

TO-220

RoHS COMPLIANT





1. Gate (G)
2. Drain (D)
3. Source (S)

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Absolute Maximum Ratings (T_C=25℃unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	-100	V
Continuous drain current T_C = 25°C (Silicon limit) T_C = 25°C (Package limit) T_C = 100°C (Silicon limit)	I_D	 -50 -120 -25	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	-480	A
Avalanche energy, single pulse (L=0.5mH, Rg=25Ω)	E_{AS}	110	mJ
Gate-Source voltage	V_{GS}	±20	V
Power dissipation (T_C = 25°C)	P_{tot}	111	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+150	°C
Soldering temperature, wave soldering only allowed at leads (1.6mm from case for 10s)	T_{sold}	260	°C

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	1.13	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	84	

Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Static Characteristic						
Drain-source breakdown voltage	BV_{DSS}	-100	-	-	V	V_{GS}=0V, I_D=-250uA
Gate threshold voltage	$V_{GS(th)}$	-1.5	-2	-2.5	V	V_{DS}=V_{GS},I_D=-250uA
Zero gate voltage drain current	I_{DSS}	- -	-0.05 -5	-1 -20	μA	V_{DS}=-100V,V_{GS}=0V T_j=25°C T_j=150°C
Gate-source leakage current	I_{GSS}	-	-10	-100	nA	V_{GS}=-20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	- -	31 61	37 73	mΩ	V_{GS}=-10V, I_D=-22A, Tj=25°C Tj=150°C
Transconductance	g_{fs}	-	60	-	S	V_{DS}=-5V,I_D=-22A
Dynamic Characteristic						
Input Capacitance	C_{iss}	-	5612	-	pF	V_{GS}=0V, V_{DS}=-50V, f=1MHz
Output Capacitance	C_{oss}	-	180	-		
Reverse Transfer Capacitance	C_{rss}	-	80	-		
Gate Total Charge	$_G$	-	102	-	nC	V_{GS}=-10V, V_{DS}=-50V, I_D=-22A, f=1MHz
Gate-Source charge	$_{gs}$	-	25	-		
Gate-Drain charge	$_{gd}$	-	19	-		
Turn-on delay time	$t_{d(on)}$	-	15	-	ns	V_{GS}=-10V, V_{DD}=-50V, R_{G_ext}=2.7Ω,ID=-22A
Rise time	t_r	-	38	-		
Turn-off delay time	$t_{d(off)}$	-	86	-		
Fall time	t_f	-	68	-		
Gate resistance	R_G	-	4.3	-	Ω	V_{GS}=0V, V_{DS}=0V, f=1MHz

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Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Body Diode Forward Voltage	V_{SD}	-	-0.9	-1.3	V	V_{GS}=0V,I_{SD}=-22A
Body Diode Forward Current	I_S			-50	A	T_C = 25°C
Body Diode Reverse Recovery Time	t_{rr}	-	36	-	ns	I_F=-22A, dI/dt=100A/µs
Body Diode Reverse Recovery Charge	$_{rr}$	-	62	-	nC	

*The value of R_{thJA} is measured by placing the device in a still air box which is one cubic foot.

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Typical Characteristics (T_J =25℃ Noted)

Fig 1: Output Characteristics

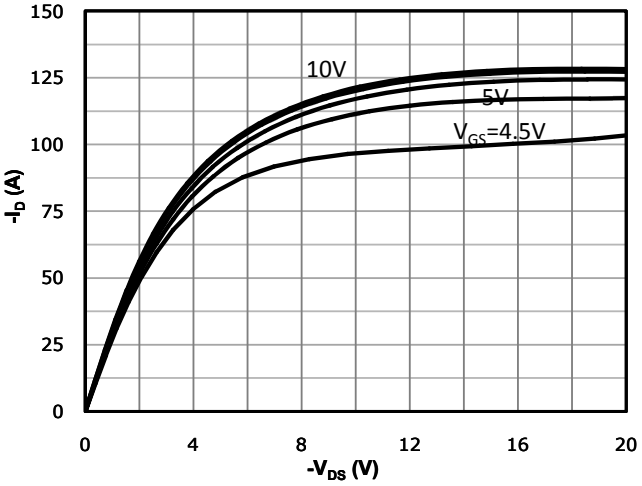


Fig 2: Transfer Characteristics

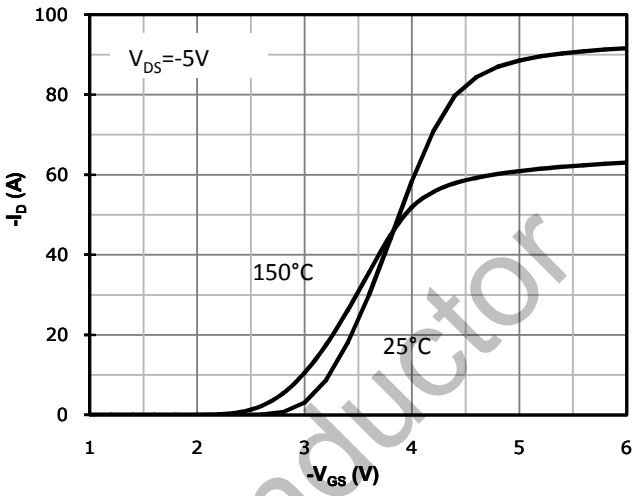


Fig 3: Rds(on) vs Drain Current and Gate Voltage

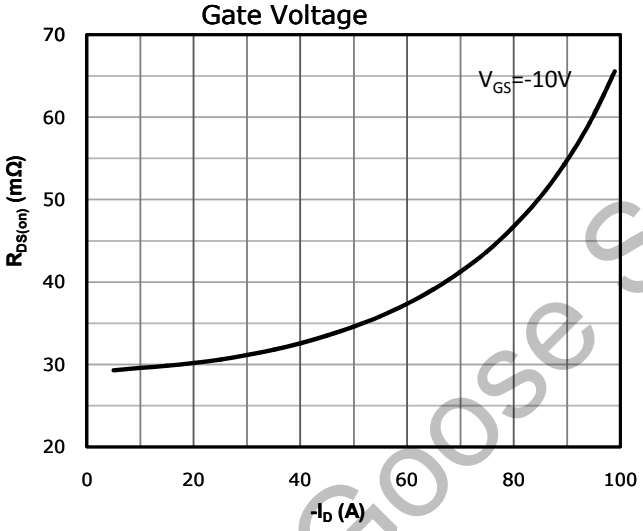


Fig 4: Rds(on) vs Gate Voltage

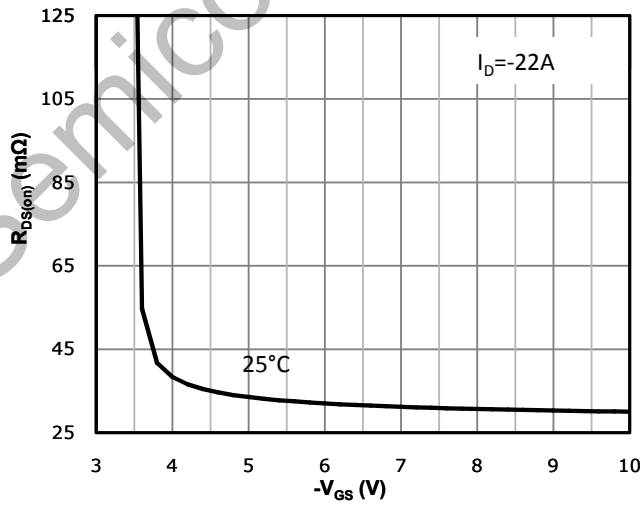


Fig 5: Rds(on) vs. Temperature

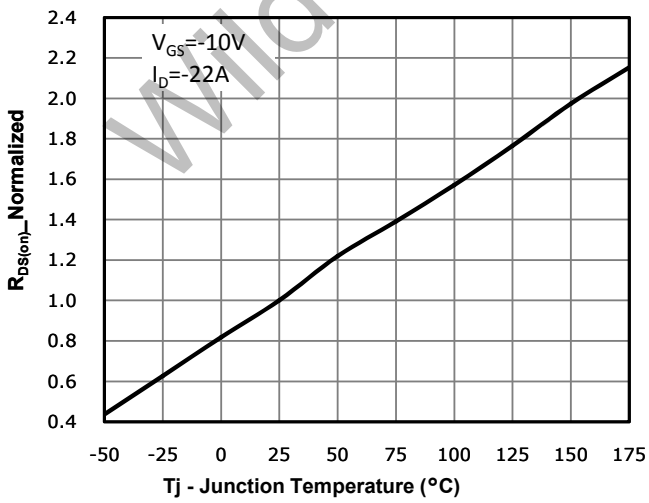
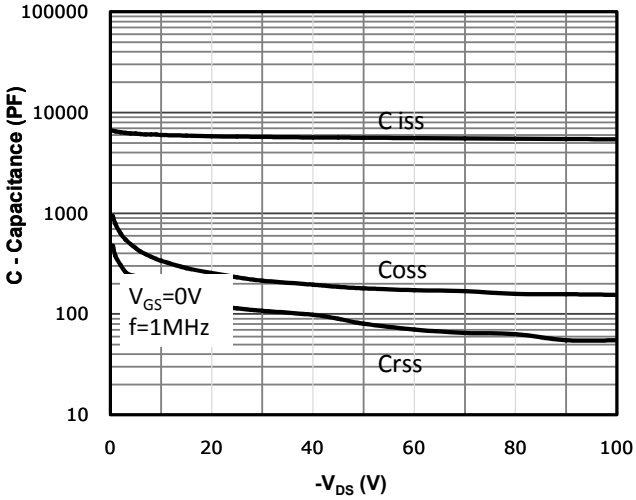


Fig 6: Capacitance Characteristics



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Typical Characteristics (T_J =25℃ Noted)

Fig 7: Gate Charge Characteristics

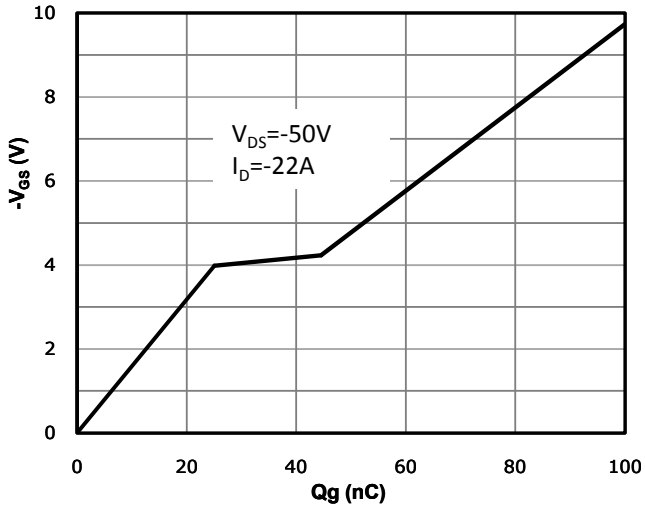


Fig 8: Body-diode Forward Characteristics

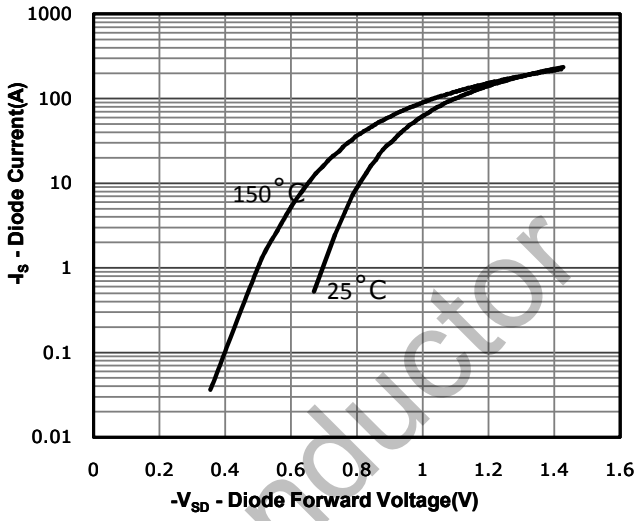


Fig 9: Power Dissipation

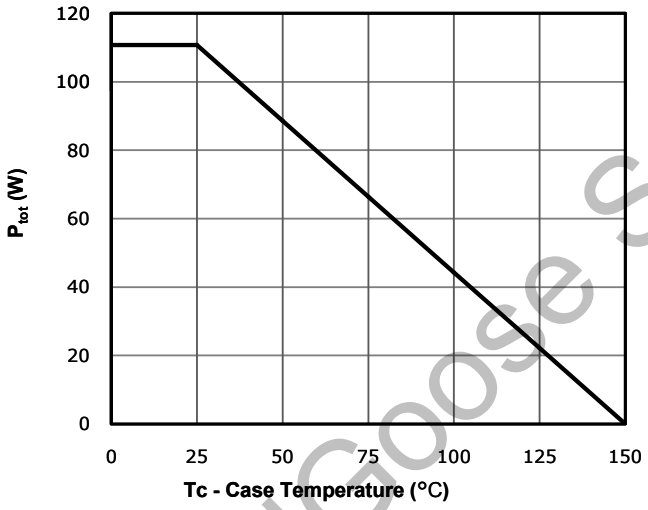


Fig 10: Drain Current Derating

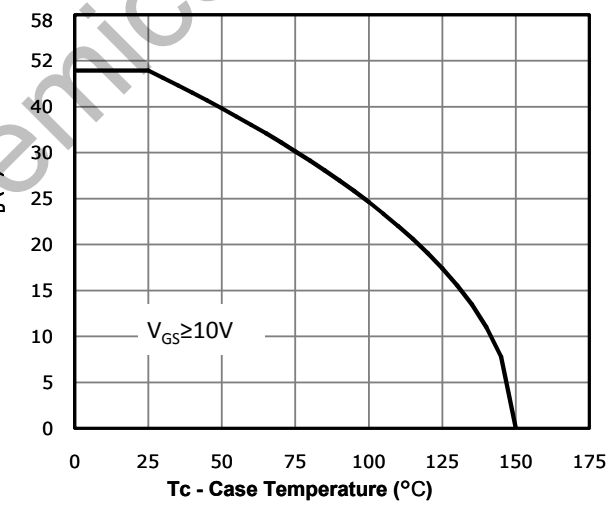
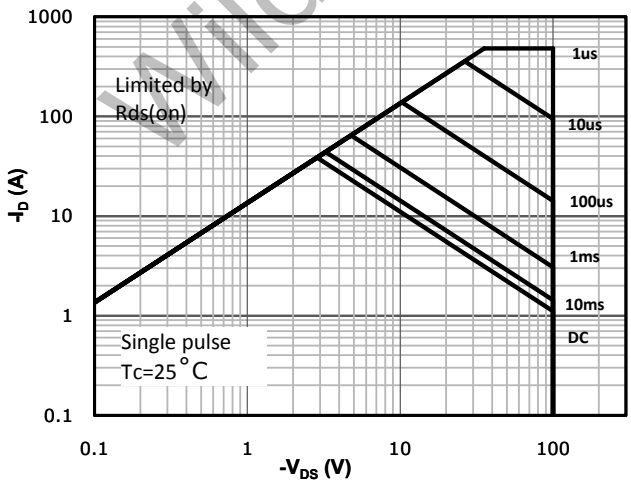


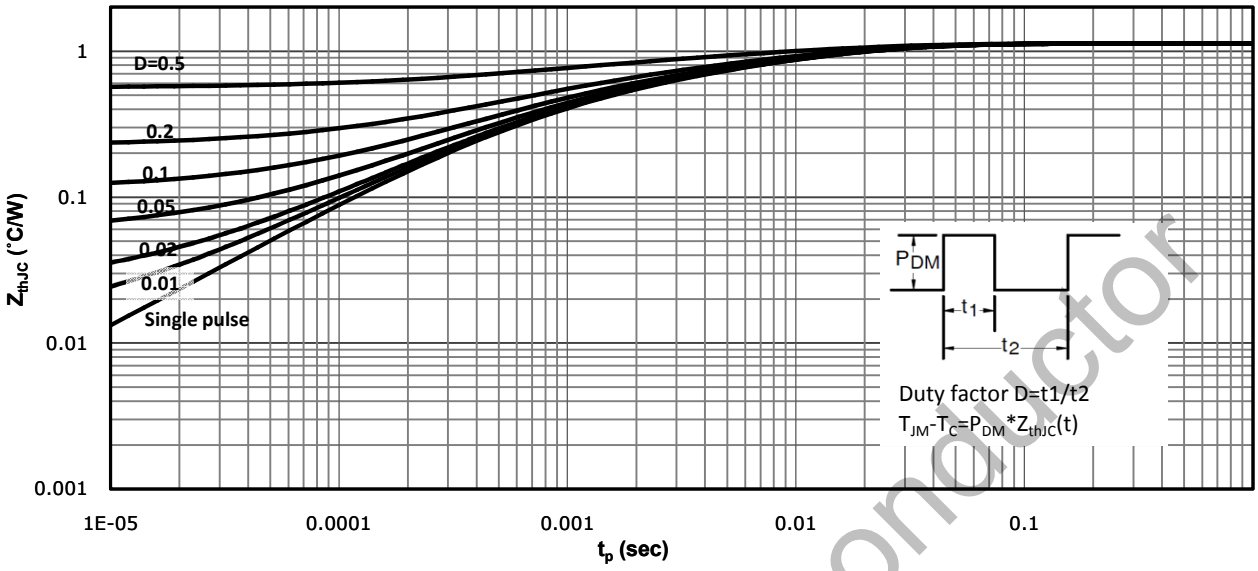
Fig 11: Safe Operating Area



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Typical Characteristics (T_J =25℃ Noted)

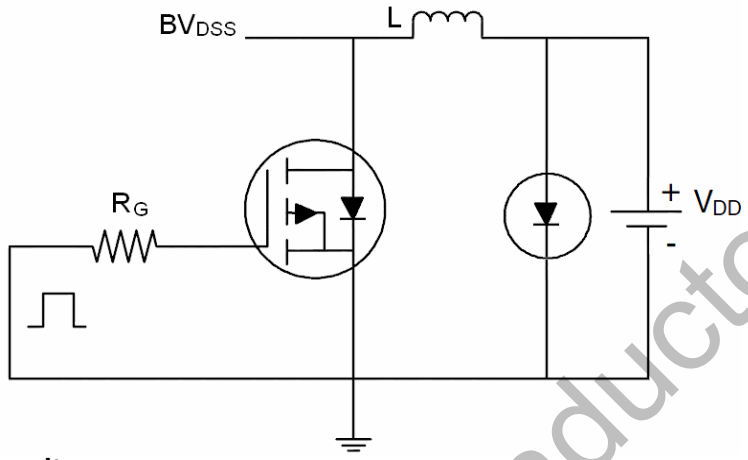
Fig 12: Max. Transient Thermal Impedance



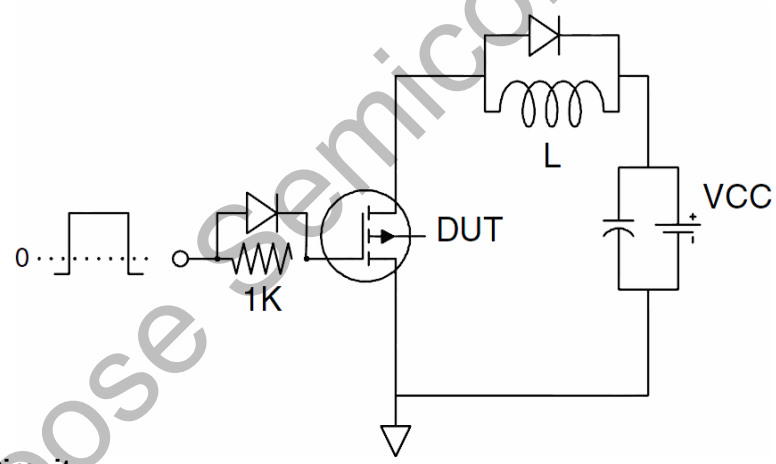
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Test Circuit

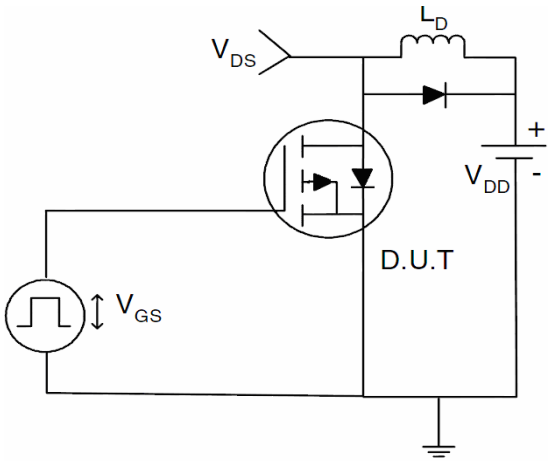
1) E_{AS} Test Circuit



2) Gate Charge Test Circuit



3) Switch Time Test Circuit

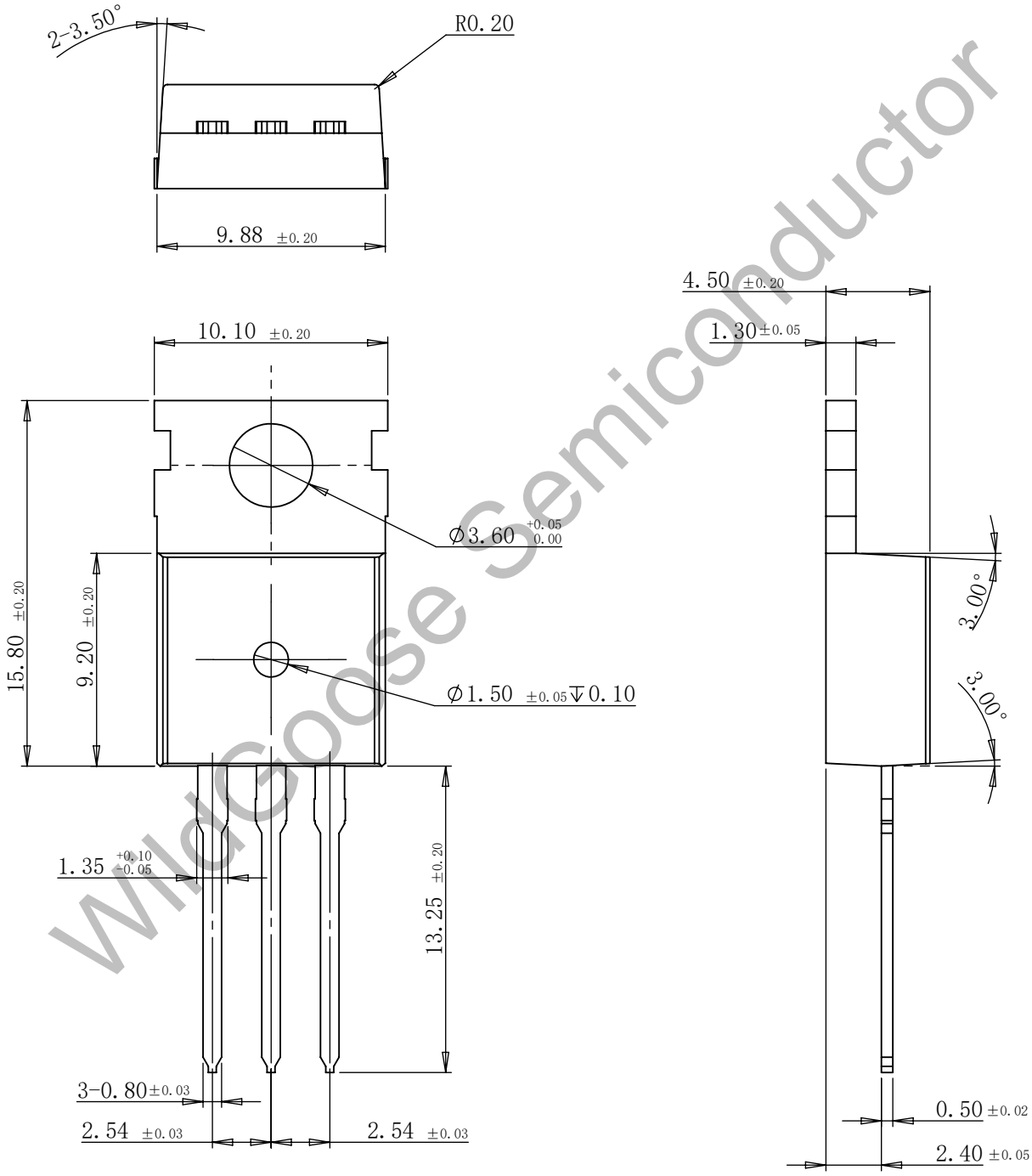


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Package Dimension

TO-220

Unit: mm



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