



PJM50H30NTH

N-Channel Power MOSFET

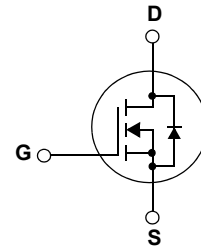
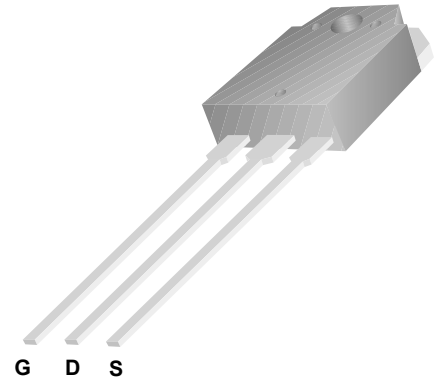
Features

- Advanced Planar Process
- $R_{DS(ON)}$, typ.=150m Ω @VGS=10V
- Low Gate Charge Minimize Switching Loss
- Rugged Poly Silicon Gate Structure

Applications

- BLDC Motor Driver
- Electric Welder
- High Efficiency SMPS

TO-3PN



Absolute Maximum Ratings

Ratings at $T_C = 25^\circ\text{C}$ unless otherwise specified.

Parameter	Symbol	Value	Units
Drain-to-Source Voltage	V_{DS}	500	V
Continuous Drain Current	I_D	30	A
		$T_C=100^\circ\text{C}$ 18	
Pulsed Drain Current ^{Note 1}	I_{DM}	120	A
Gate-to-Source Voltage	V_{GS}	± 30	V
Single Pulse Avalanche Energy	E_{AS}	2000	mJ
Peak Diode Recovery ^{Note 2}	dv/dt	5.0	V/ns
Power Dissipation	P_D	333	W
Derating Factor above 25°C		2.63	W/ $^\circ\text{C}$
Operating Junction and Storage Temperature Range	T_{STG}	-55 to 150	$^\circ\text{C}$
Maximum Temperature for Soldering	T_L	300	$^\circ\text{C}$

Note: 1. Repetitive rating; pulse width limited by maximum junction temperature.
2. Package limited current.
3. Pulse width $\leq 380\mu\text{s}$; duty cycle $\leq 2\%$.



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Thermal Characteristics

Parameter	Symbol	Value	Units
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.38	$^{\circ}C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	50	$^{\circ}C/W$

Electrical Characteristics

Ratings at $T_C = 25^{\circ}C$ unless otherwise specified.

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	500	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.5	-	4.5	V
Gate Leakage Current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 30V$	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 500V, V_{GS} = 0V$	-	-	5	μA
		$V_{DS} = 400V, V_{GS} = 0V, T_J = 125^{\circ}C$	-	-	100	
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 15A$	-	0.15	0.2	Ω
Forward Transconductance	g_{FS}	$V_{DS} = 25V, I_D = 15A$	-	38	-	S
Dynamic Characteristics						
Total Gate Charge	Q_g	$V_{DS} = 250V, V_{GS} = 0 \sim 10V, I_D = 30A$	-	108	-	nC
Gate-Source Charge	Q_{gs}		-	21	-	
Gate-Drain Charge	Q_{gd}		-	44	-	
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$	-	4150	-	pF
Output Capacitance	C_{oss}		-	82	-	
Reverse Transfer Capacitance	C_{rss}		-	500	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 250V, R_g = 10\Omega, V_{GS} = 10V, I_D = 30A$	-	34	-	ns
Turn-On Rise Time	t_r		-	114	-	
Turn-Off Delay Time	$t_{d(off)}$		-	108	-	
Turn-Off Fall Time	t_f		-	72	-	
Source-Drain Diode Characteristics						
Diode Forward Current	I_{SD}		-	-	30	A
Diode Forward Voltage	V_{SD}	$I_S = 30A, V_{GS} = 0V$	-	0.88	1.5	V
Reverse Recovery Time	t_{rr}	$I_S = 30A, dI_f/dt = 100A/\mu s, V_{GS} = 0V$	-	900	-	ns
Reverse Recovery Charge	Q_{rr}		-	2.1	-	μC



Electrical Characteristics Curves

Figure 1. Maximum Transient Thermal Impedance

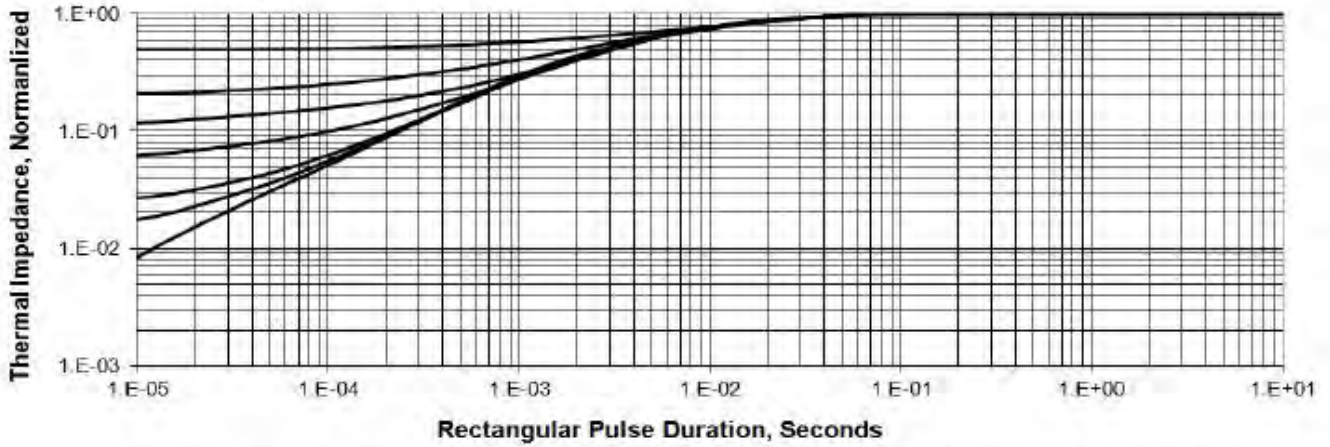


Figure 2. Max. Power Dissipation vs Case Temperature

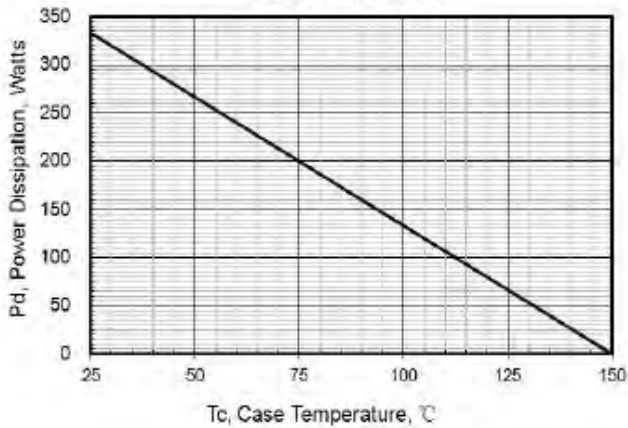


Figure 3. Maximum Continuous Drain Current vs Tc

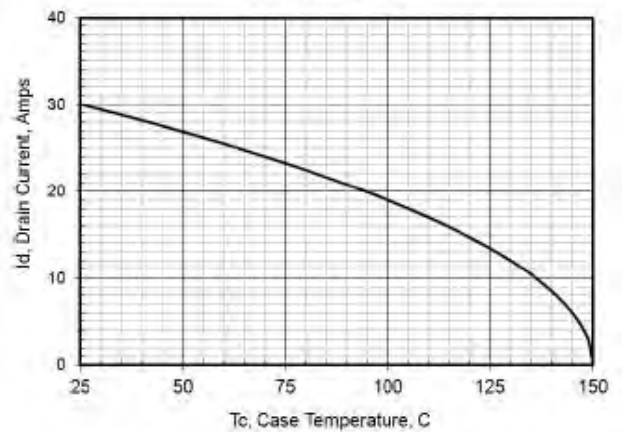


Figure 4. Output Characteristics

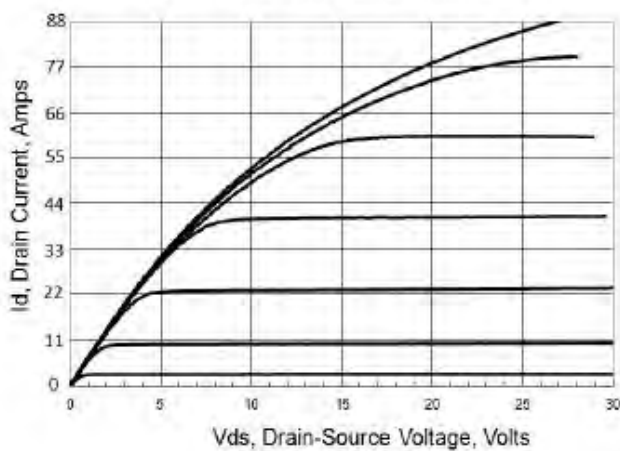


Figure 5. Rds(on) vs Gate Voltage

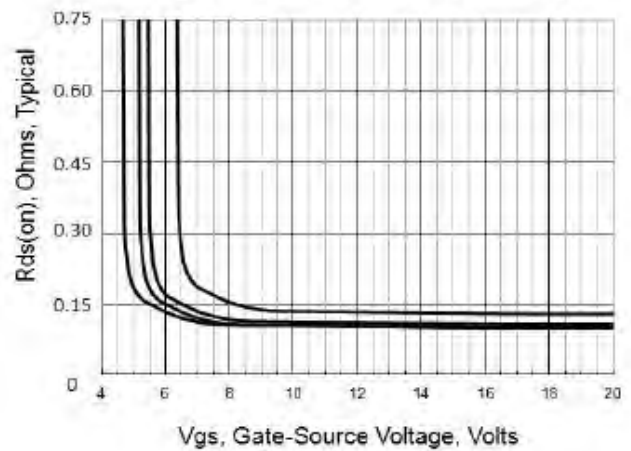




Figure 6. Peak Current Capability

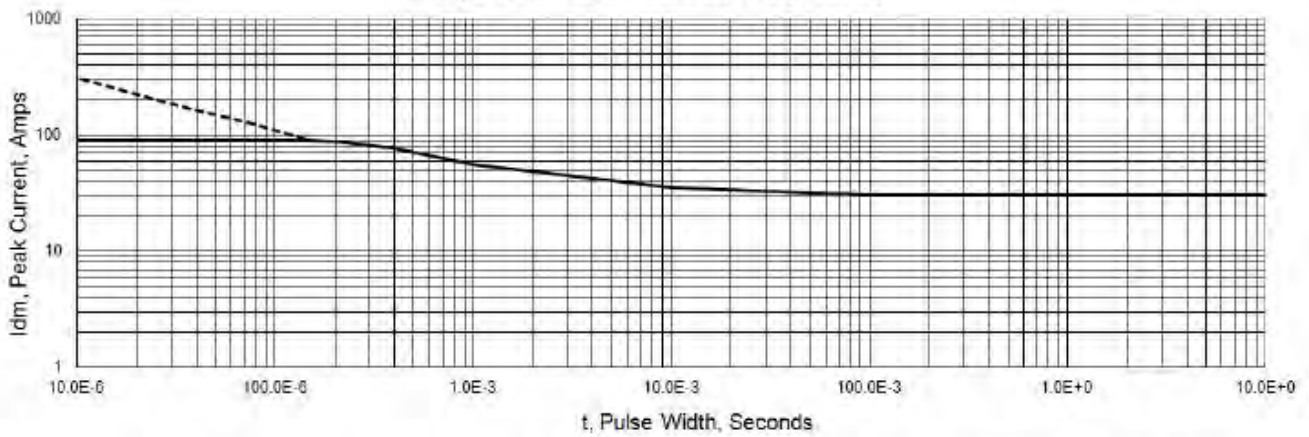


Figure 7. Transfer Characteristics

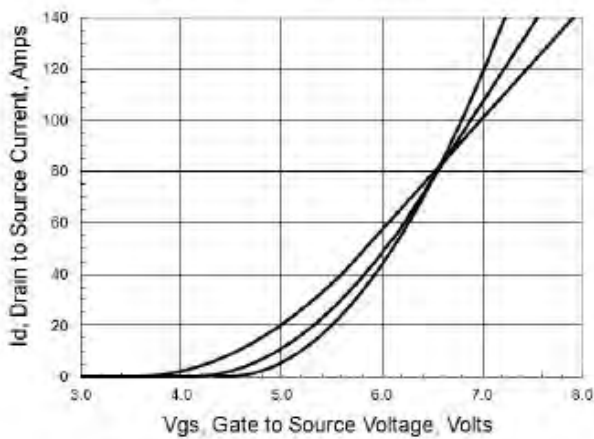


Figure 8. Unclamped Inductive Switching Capability

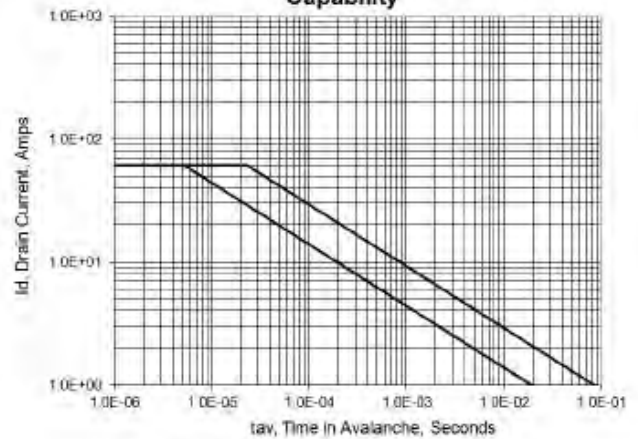


Figure 9. Drain to Source ON Resistance vs Drain Current

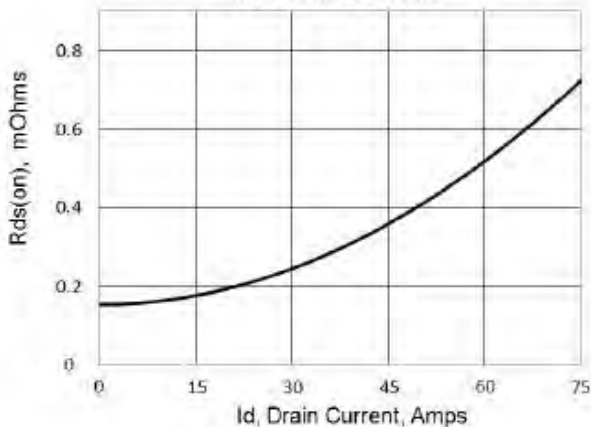
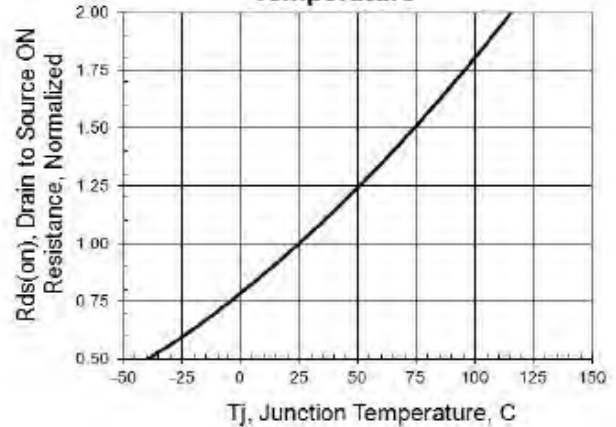


Figure 10. $R_{ds(on)}$ vs Junction Temperature





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Figure 11. Typical Breakdown Voltage vs. Junction Temperature

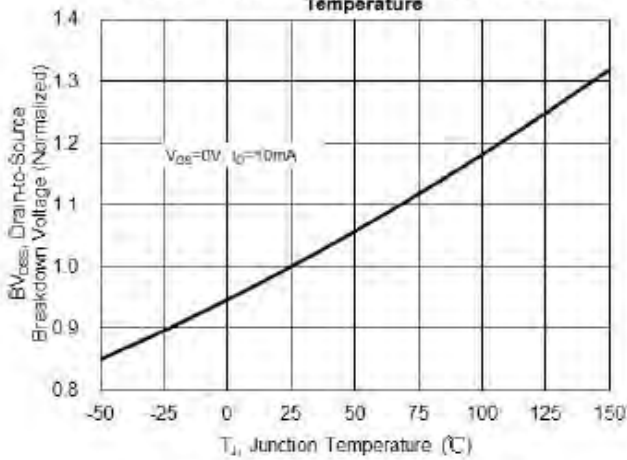


Figure 12. Typical Threshold Voltage vs. Junction Temperature

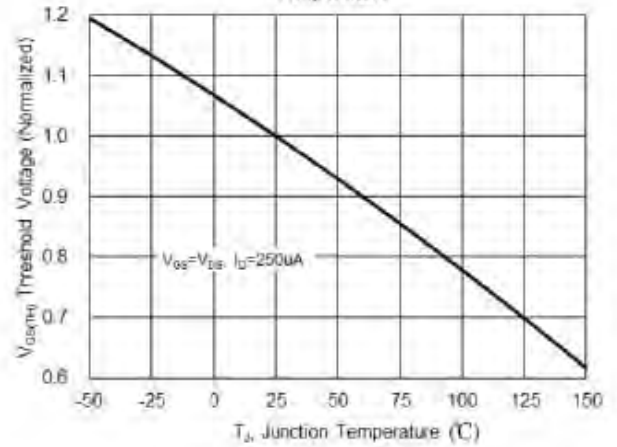


Figure 13. Maximum Safe Operating Area

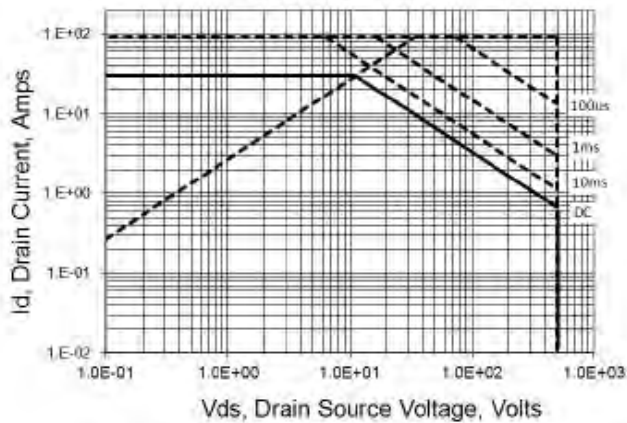


Figure 14. Capacitance vs V_{DS}

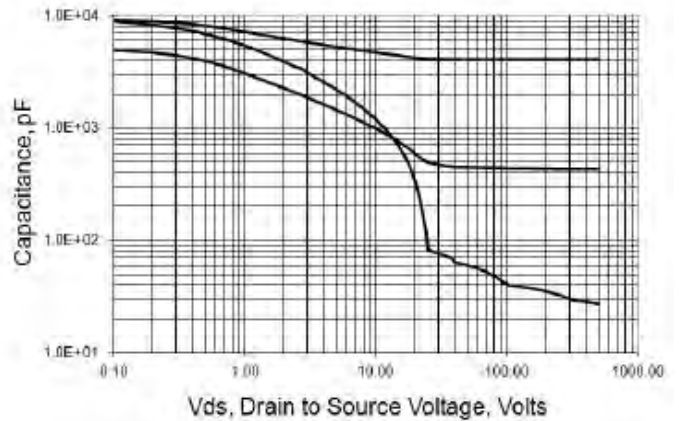


Figure 15. Typical Gate Charge

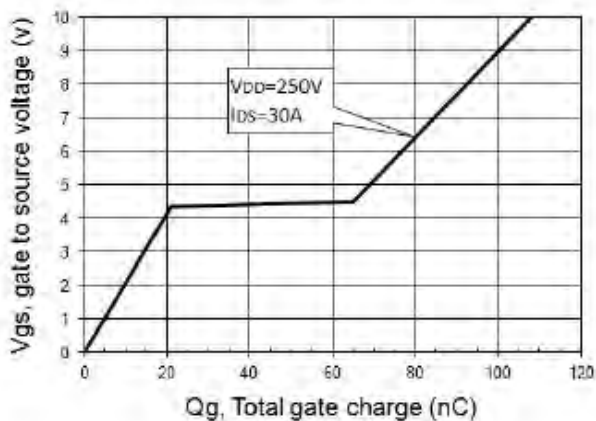
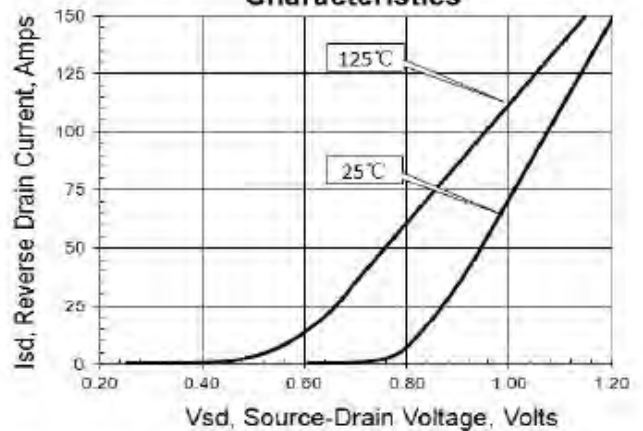


Figure 16. Body Diode Transfer Characteristics



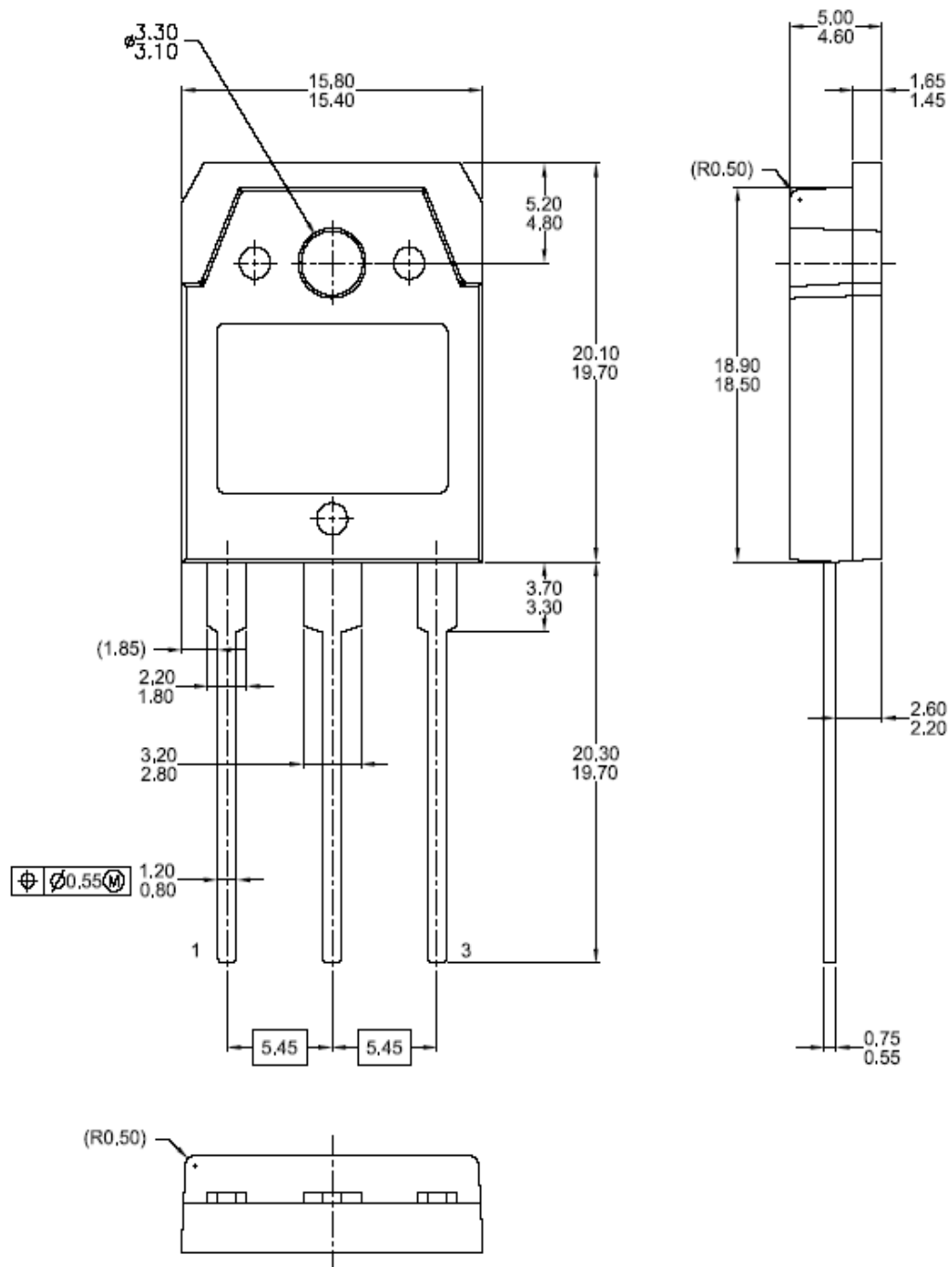


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Package Outline

TO-3PN



Ordering information

Device	Package	Shipping
PJM50H30NTH	TO-3PN	30PCS/Tube