

PJU7NA65 / PJD7NA65 / PJP7NA65 / PJF7NA65

650V N-Channel MOSFET

Voltage

650 V

Current

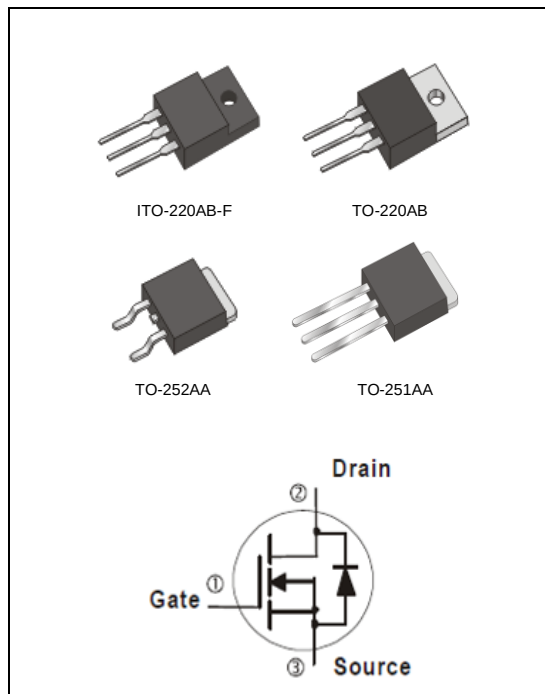
7 A

Features

- $R_{DS(ON)}$, $V_{GS}@10V$, $I_D@3.5A < 1.5\Omega$
- High switching speed
- Improved dv/dt capability
- Low Gate Charge
- Low reverse transfer capacitance
- Lead free in compliance with EU RoHS 2.0
- Green molding compound as per IEC 61249 standard

Mechanical Data

- Case : TO-251AA, TO-252AA, TO-220AB, ITO-220AB-F Package
- Terminals : Solderable per MIL-STD-750, Method 2026
- TO-251AA Approx. Weight : 0.0104 ounces, 0.297grams
- TO-252AA Approx. Weight : 0.0104 ounces, 0.297grams
- TO-220AB Approx. Weight : 0.067 ounces, 1.9 grams
- ITO-220AB-F Approx. Weight : 0.068 ounces, 2 grams



Maximum Ratings and Thermal Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

PARAMETER		SYMBOL	TO-251AA TO-251AA-1	TO-220AB	ITO-220AB-F	TO-252AA	UNITS
Drain-Source Voltage		V _{DS}	650				V
Gate-Source Voltage		V _{GS}	±30				
Continuous Drain Current ^(Note 4)		I _D	7				A
Pulsed Drain Current		I _{DM}	28				
Single Pulse Avalanche Energy ^(Note 1)		E _{AS}	435				mJ
Power Dissipation	T _C =25°C	P _D	140	145	46	140	W
	Derate above 25°C		1.12	1.16	0.37	1.12	W/°C
Operating Junction and Storage Temperature Range		T _J ,T _{STG}	-55~150				°C
Typical Thermal Resistance ^(Note 4)							
- Junction to Case		R _{θJC}	0.89	0.88	2.72	0.89	°C/W
- Junction to Ambient		R _{θJA}	110	62.5	120	110	

- Limited only By Maximum Junction Temperature



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Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	650	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	2	2.88	4	
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =3.5A	-	1.35	1.5	Ω
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =650V, V _{GS} =0V	-	-	1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =+30V, V _{DS} =0V	-	-	+100	nA
Diode Forward Voltage	V _{SD}	I _S =7A, V _{GS} =0V	-	0.88	1.4	V
Dynamic (Note 5)						
Total Gate Charge	Q _g	V _{DS} =520V, I _D =7A, V _{GS} =10V (Note 2,3)	-	16.8	-	nC
Gate-Source Charge	Q _{gs}		-	5	-	
Gate-Drain Charge	Q _{gd}		-	6	-	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHZ	-	754	-	pF
Output Capacitance	C _{oss}		-	97	-	
Reverse Transfer Capacitance	C _{rss}		-	0.8	-	
Turn-On Delay Time	td _(on)	V _{DD} =325V, I _D =7A, R _G =25Ω (Note 2,3)	-	14	-	ns
Turn-On Rise Time	t _r		-	28	-	
Turn-Off Delay Time	td _(off)		-	38	-	
Turn-Off Fall Time	t _f		-	28	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I _S	---	-	-	7	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}	---	-	-	28	A
Reverse Recovery Time	trr	V _{GS} =0V, I _S =7A	-	493	-	ns
Reverse Recovery Charge	Qrr	dl _F / dt=100A/us (Note 2)	-	2.99	-	uC

NOTES :

1. $L=30\text{mH}, I_{AS}=5.25A, V_{DD}=50V, R_G=25\text{ ohm}$, Starting $T_J=25^{\circ}\text{C}$.
2. Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature typical characteristics.
4. The maximum current rating is package limited.
5. Guaranteed by design, not subject to production testing.

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TYPICAL CHARACTERISTIC CURVES

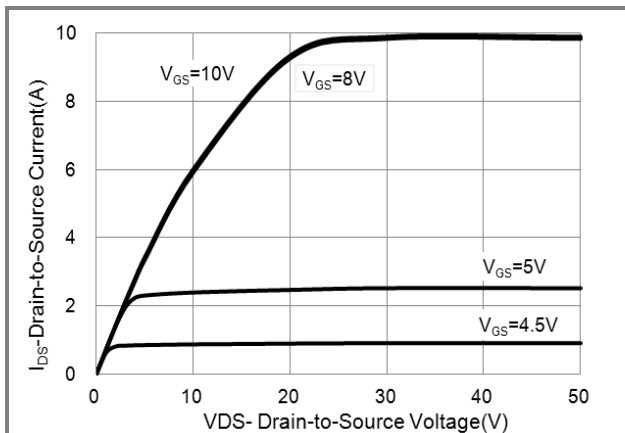


Fig.1 Output Characteristics

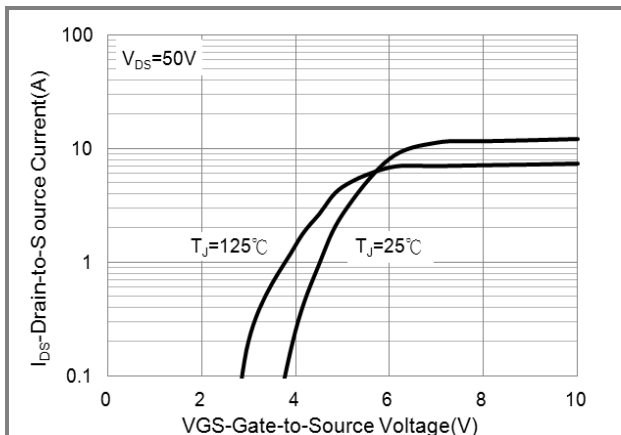


Fig.2 Transfer Characteristics

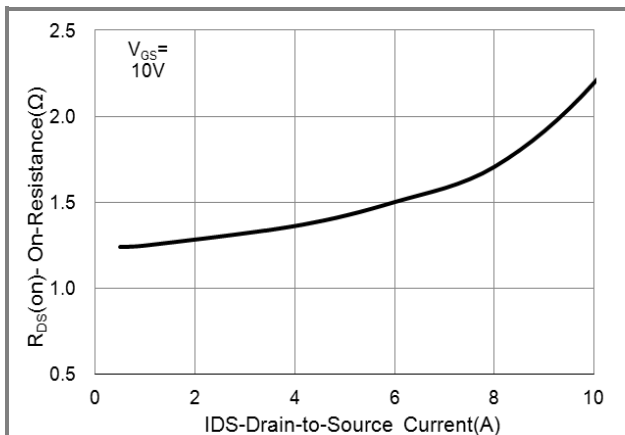


Fig.3 On-Resistance vs. Drain Current

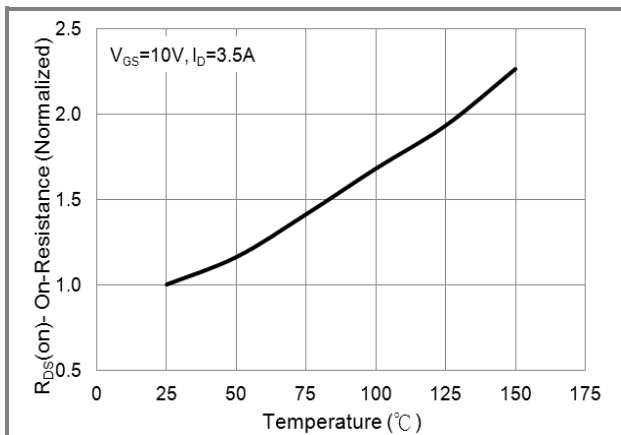


Fig.4 Resistance vs. Junction Temperature

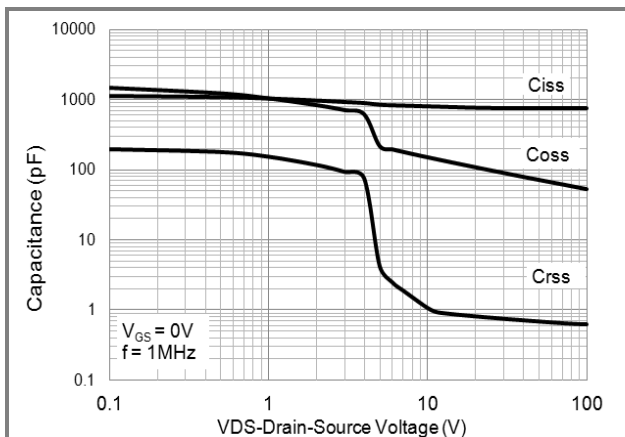


Fig.5 Capacitance vs. Drain-Source Voltage

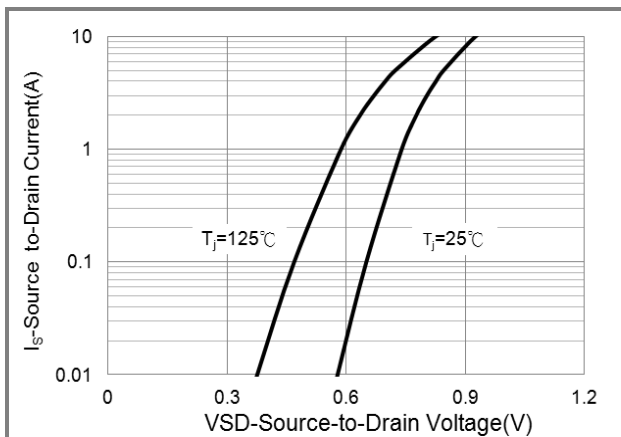


Fig.6 Source-Drain Diode Forward Voltage

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TYPICAL CHARACTERISTIC CURVES

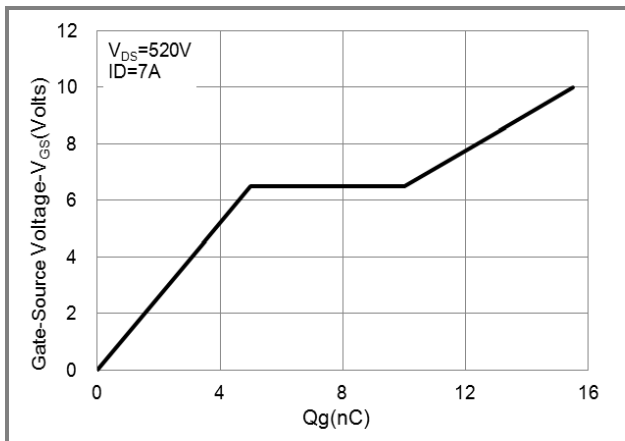


Fig.7 Gate Charge

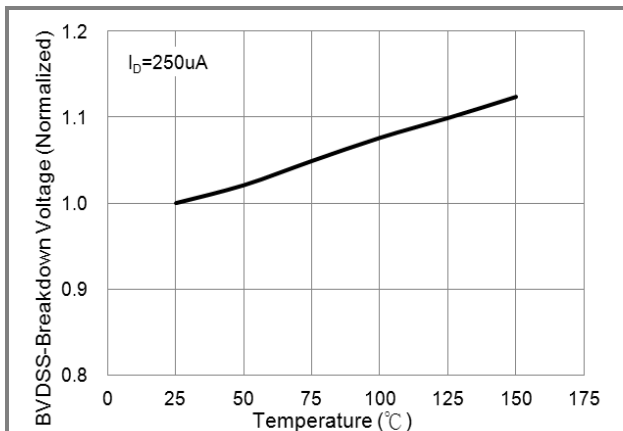


Fig.8 BV_{DSS} vs. Junction Temperature On-

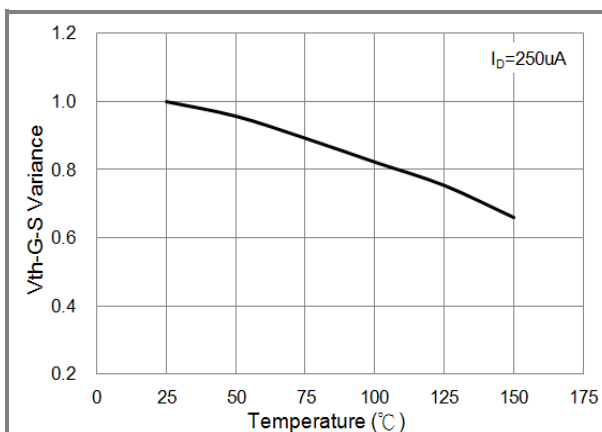


Fig.9 Threshold Voltage Variation with Temperature

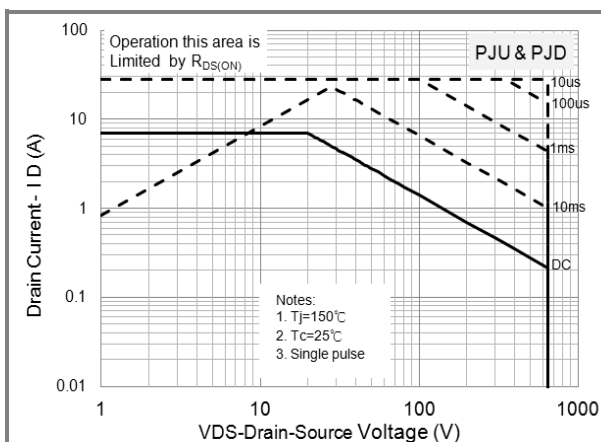


Fig.10 Maximum Safe Operating Area

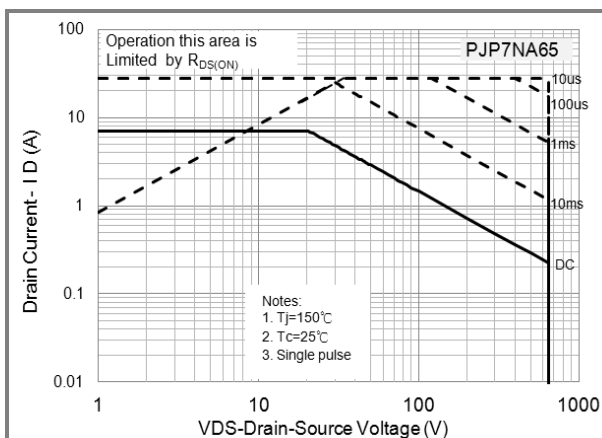


Fig.11 Maximum Safe Operating Area

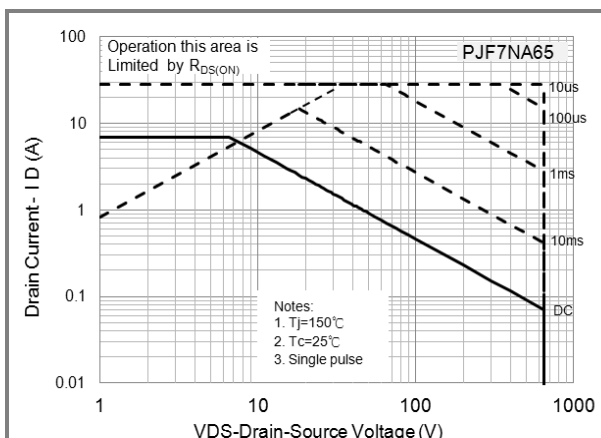


Fig.12 Maximum Safe Operating Area

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TYPICAL CHARACTERISTIC CURVES

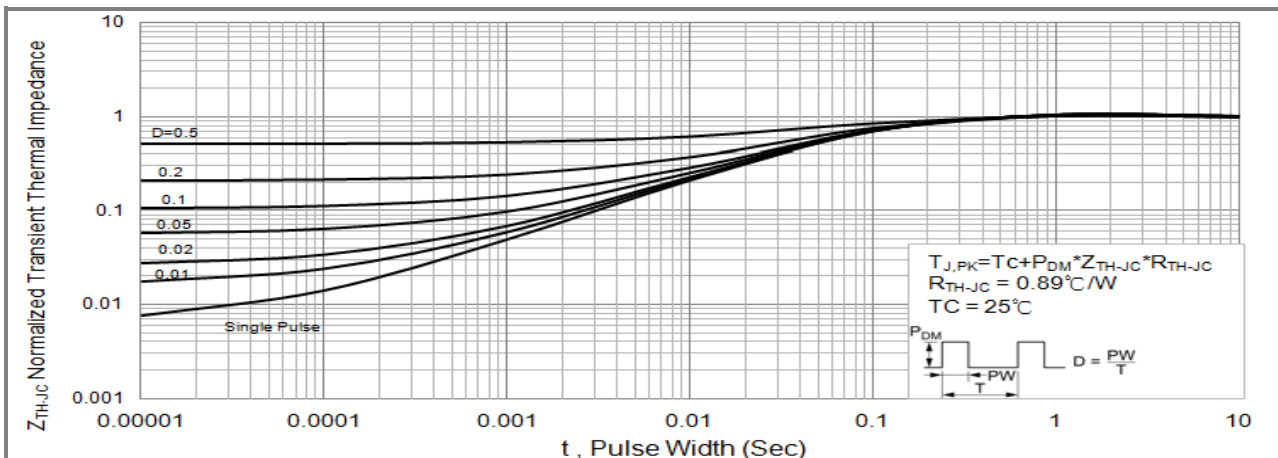


Fig.13 PJU/PJD Normalized Transient Thermal Impedance vs. Pulse Width

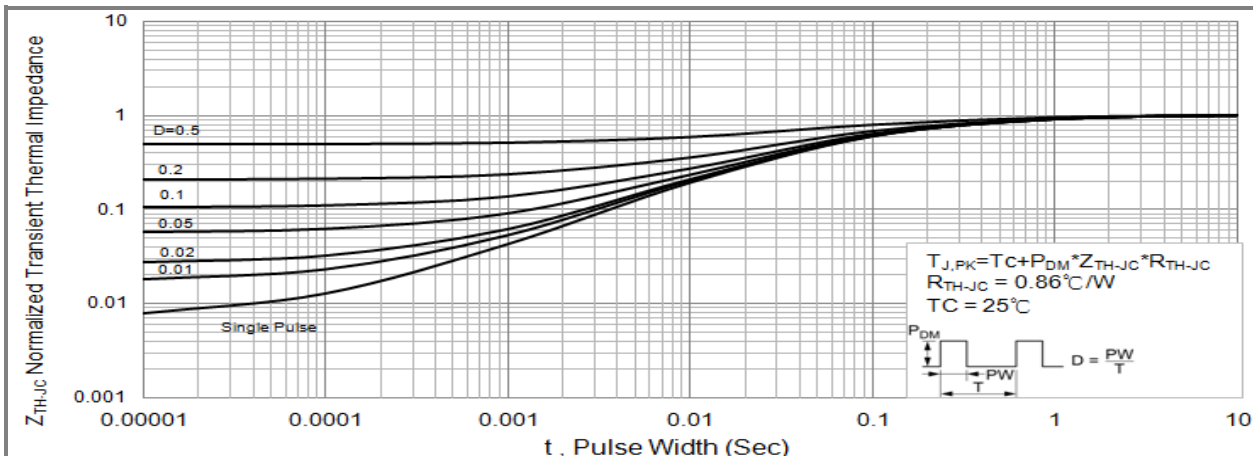


Fig.14 PJP7NA65 Normalized Transient Thermal Impedance vs. Pulse Width

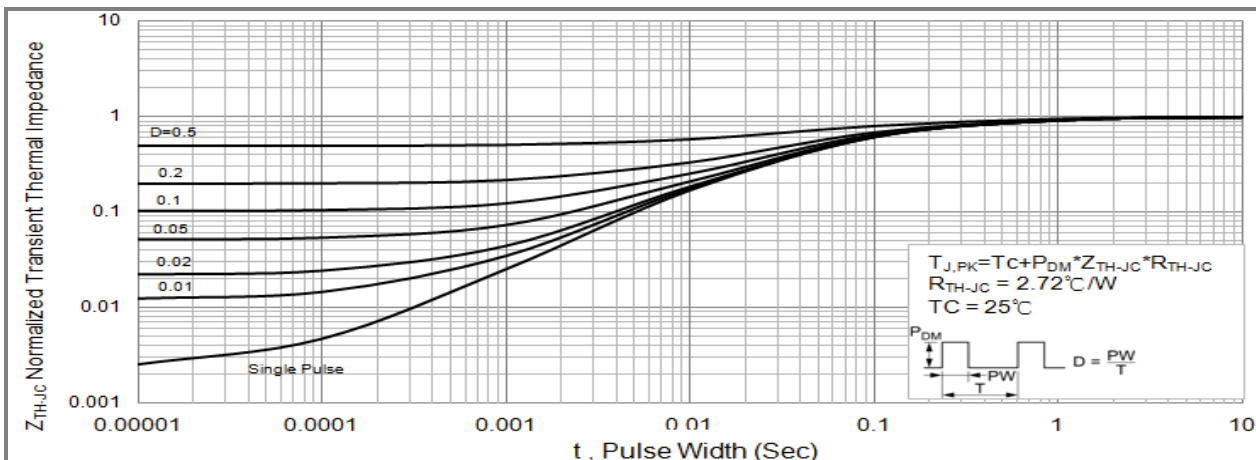
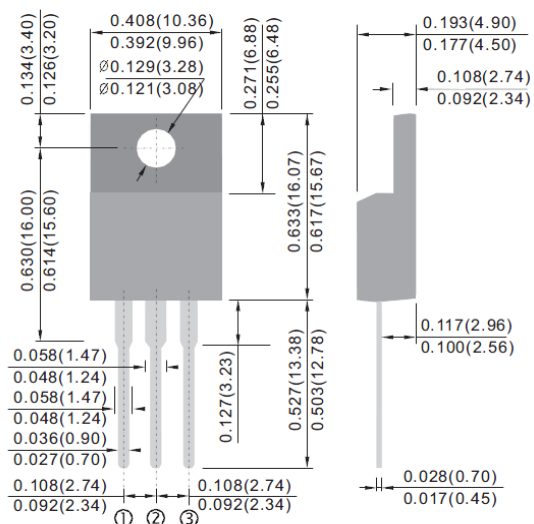


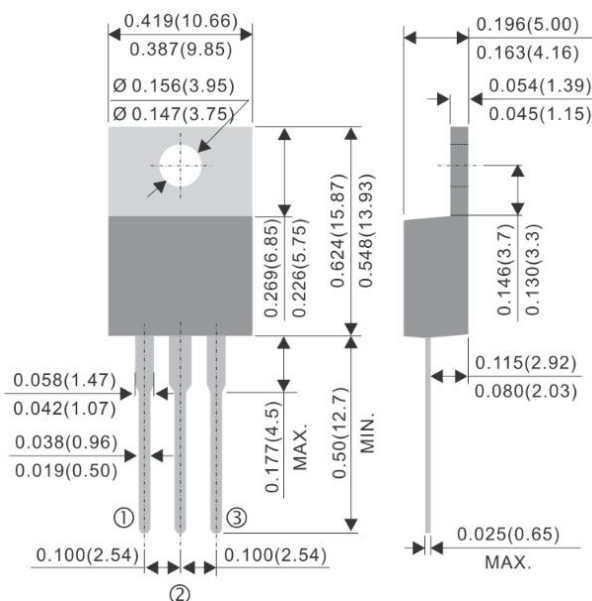
Fig.15 PJF7NA65 Normalized Transient Thermal Impedance vs. Pulse Width

Packaging Information

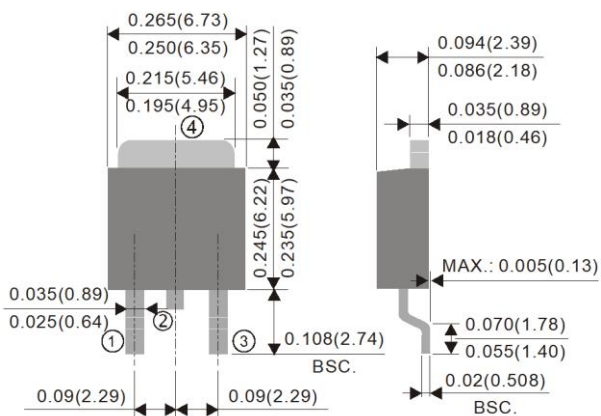
Unit: inch(mm)



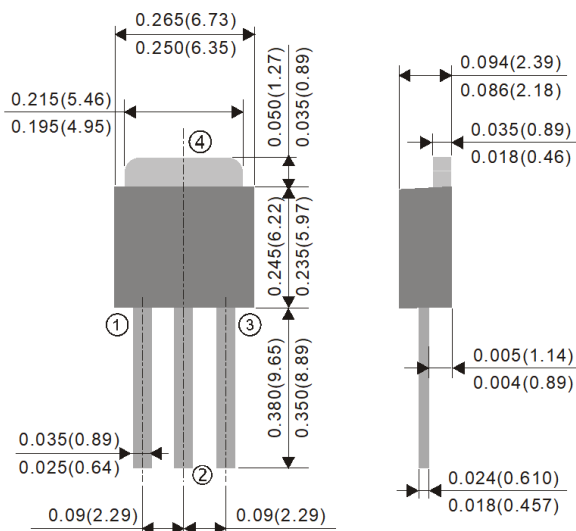
Unit: inch(mm)



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Unit: inch(mm)

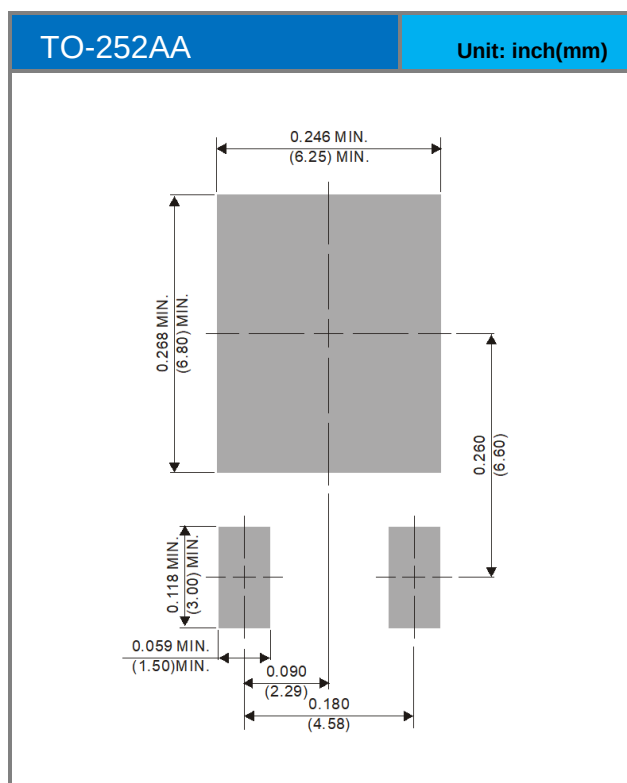


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Part No Packing Code Version

Part No Packing Code	Package Type	Packing Type	Marking	Version
PJU7NA65_T0_00001	TO-251AA	80pcs / Tube	U7NA65	Halogen free
PJD7NA65_L2_00001	TO-252AA	3,000pcs / 13" reel	D7NA65	Halogen free
PJP7NA65_T0_00001	TO-220AB	50pcs / Tube	P7NA65	Halogen free
PJF7NA65_T0_00001	ITO-220AB-F	50pcs / Tube	F7NA65	Halogen free

Mounting Pad Layout





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