



# PJU12P06 / PJD12P06

## 60V P-Channel Enhancement Mode MOSFET

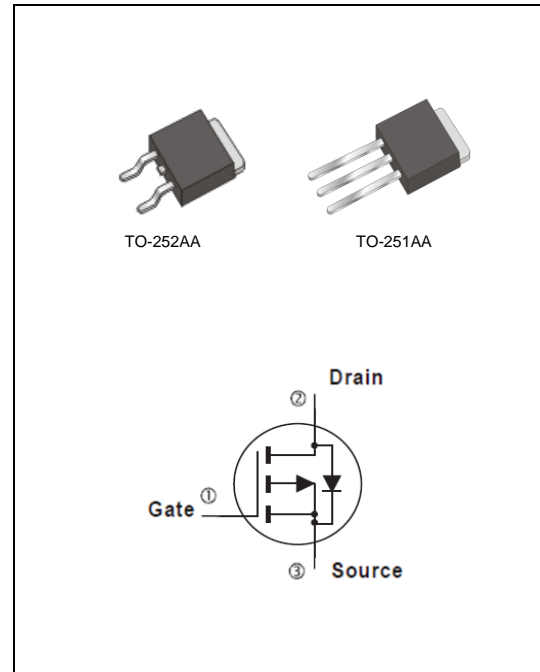
**Voltage** -60 V **Current** -12 A

### Features

- $R_{DS(ON)}$ ,  $V_{GS}@-10V$ ,  $I_D@-6A < 155m\Omega$
- 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 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



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

PARAMETER		SYMBOL	LIMIT	UNITS
Drain-Source Voltage		$V_{DS}$	-60	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	
Continuous Drain Current	$T_C=25^\circ C$	$I_D$	-12	A
	$T_C=100^\circ C$		-7.7	
Pulsed Drain Current (Note 1)	$T_C=25^\circ C$	$I_{DM}$	-48	
Power Dissipation	$T_C=25^\circ C$	$P_D$	50	W
	$T_C=100^\circ C$		20	
Continuous Drain Current	$T_A=25^\circ C$	$I_D$	-2.6	A
	$T_A=70^\circ C$		-2.0	
Power Dissipation	$T_A=25^\circ C$	$P_D$	2.0	W
Power Dissipation	$T_A=70^\circ C$		1.3	
Single Pulse Avalanche Energy (Note 6)		$E_{AS}$	337	mJ
Operating Junction and Storage Temperature Range		$T_J, T_{STG}$	-55~150	$^\circ C$
Typical Thermal Resistance (Note 4,5)	Junction to Case	$R_{\theta JC}$	2.5	$^\circ C/W$
	Junction to Ambient	$R_{\theta JA}$	62.5	

- 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
<b>Static</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-2.0	-2.86	-4.0	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-6A$	-	132	155	m $\Omega$
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-60V, V_{GS}=0V$	-	-	-1.0	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>Dynamic</b> (Note 7)						
Total Gate Charge	$Q_g$	$V_{DS}=-48V, I_D=-12A,$ $V_{GS}=-10V$ (Note 2,3)	-	10.9	-	nC
Gate-Source Charge	$Q_{gs}$		-	2.7	-	
Gate-Drain Charge	$Q_{gd}$		-	4.0	-	
Input Capacitance	$C_{iss}$	$V_{DS}=-25V, V_{GS}=0V,$ $f=1.0\text{MHz}$	-	385	-	pF
Output Capacitance	$C_{oss}$		-	158	-	
Reverse Transfer Capacitance	$C_{rss}$		-	31	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=-30V, I_D=-12A,$ $V_{GS}=-10V, R_G=6\Omega$ (Note 2,3)	-	4.4	-	ns
Turn-On Rise Time	$t_r$		-	59	-	
Turn-Off Delay Time	$t_{d(off)}$		-	20	-	
Turn-Off Fall Time	$t_f$		-	36	-	
<b>Drain-Source Diode</b>						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$	---	-	-	-12	A
Diode Forward Voltage	$V_{SD}$	$I_S=-1A, V_{GS}=0V$	-	-0.75	-1	V
Reverse Recovery Time	$t_{rr}$	$V_{GS}=0V, I_S=-12A$	-	37	-	ns
Reverse Recovery Charge	$Q_{rr}$	$di_f/dt=100A/\mu s$ (Note 2)	-	67	-	nC

**NOTES :**

1. Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$
2. Essentially independent of operating temperature typical characteristics
3. Repetitive rating, pulse width limited by junction temperature  $T_{J(MAX)}=150^\circ\text{C}$ . Ratings are based on low frequency and duty cycles to keep initial  $T_J=25^\circ\text{C}$ .
4. The maximum current rating is package limited
5.  $R_{\theta JA}$  is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. Mounted on a 1 inch<sup>2</sup> with 2oz.square pad of copper
6.  $L=3\text{mH}, I_{AS}=-15A, V_{GS}=-10V, V_{DS}=-25V, R_G=25\text{ohm}$ , Starting  $T_J=25^\circ\text{C}$
7. Guaranteed by design, not subject to production testing.



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## TYPICAL CHARACTERISTIC CURVES

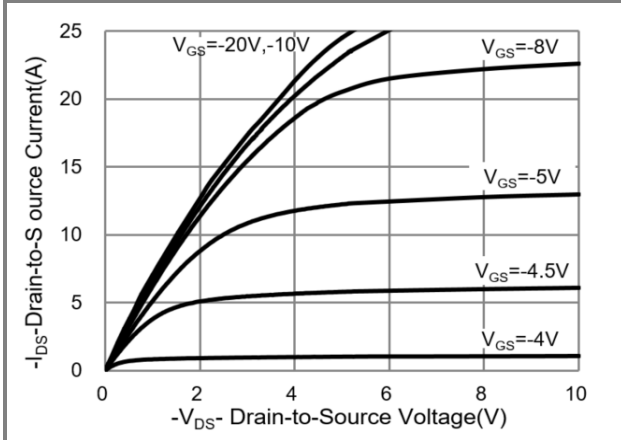


Fig.1 On-Region Characteristics

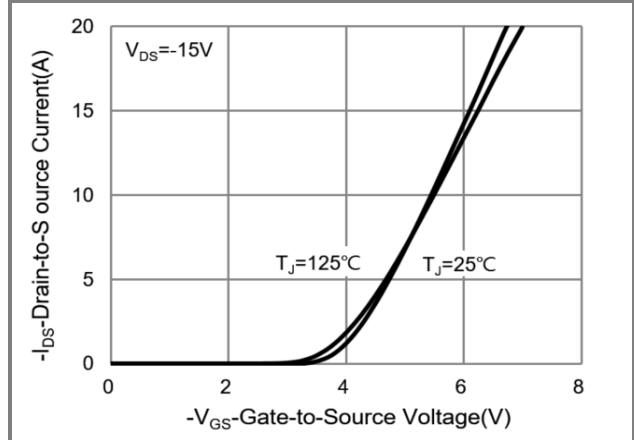


Fig.2 Transfer Characteristics

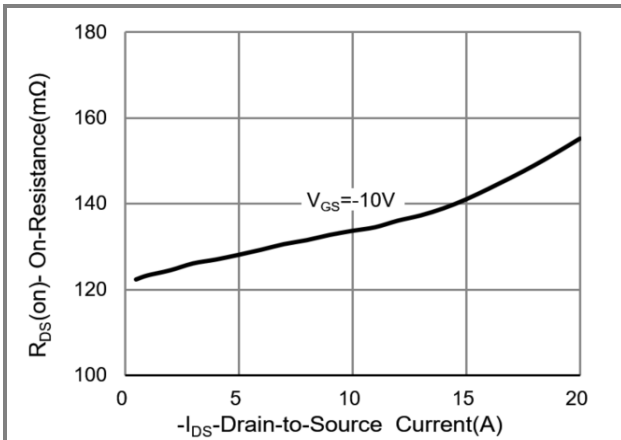


Fig.3 On-Resistance vs. Drain Current

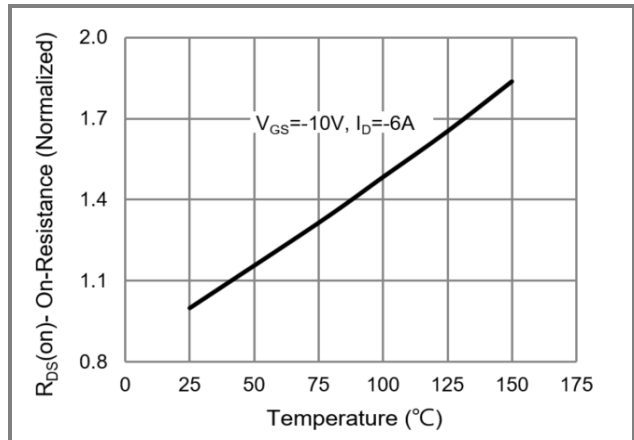


Fig.4 On-Resistance vs. Junction temperature

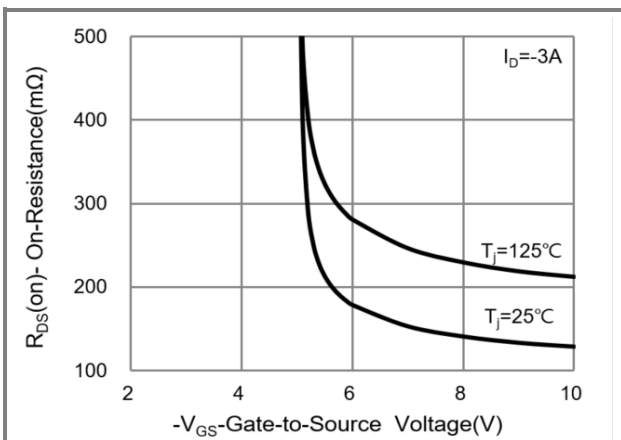


Fig.5 On-Resistance Variation with  $V_{GS}$

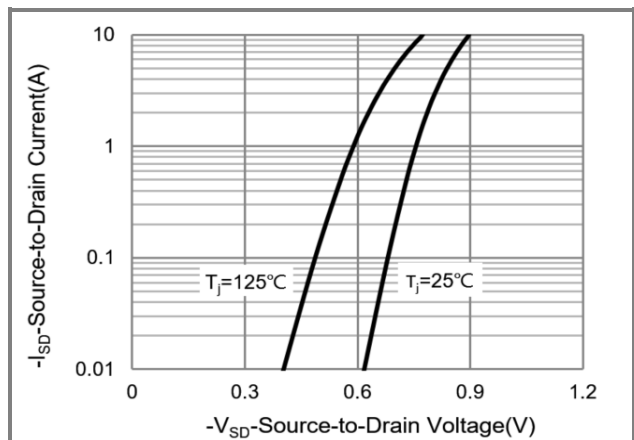


Fig.6 Body Diode Characteristics



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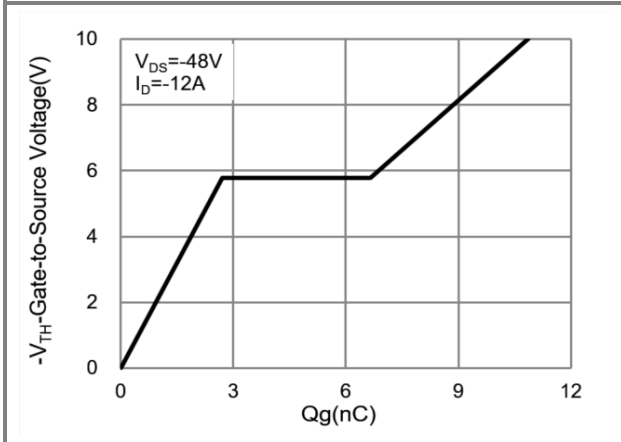


Fig.7 Gate-Charge Characteristics

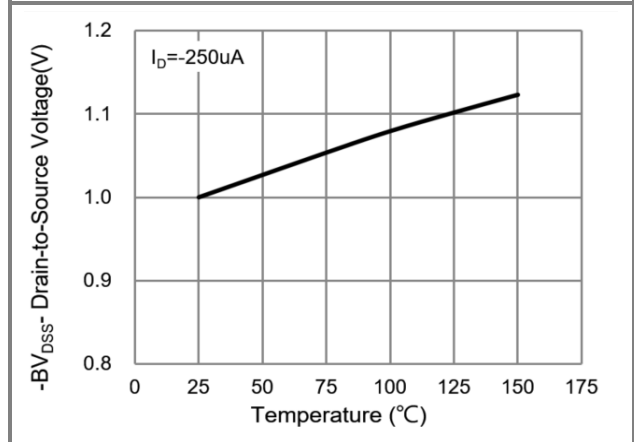


Fig.8 Breakdown Voltage Variation vs. Temperature

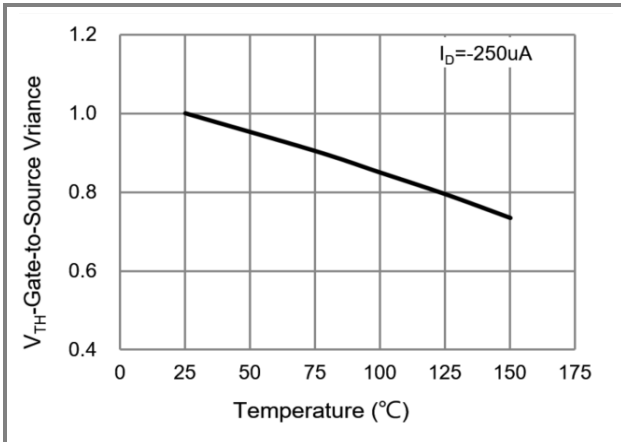


Fig.9 Threshold Voltage Variation with Temperature

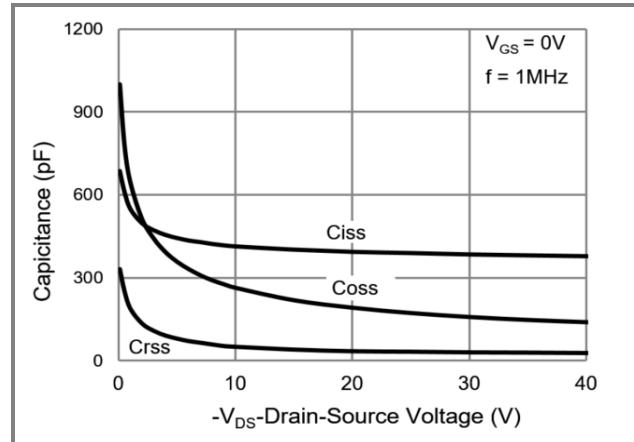


Fig.10 Capacitance vs. Drain-Source Voltage

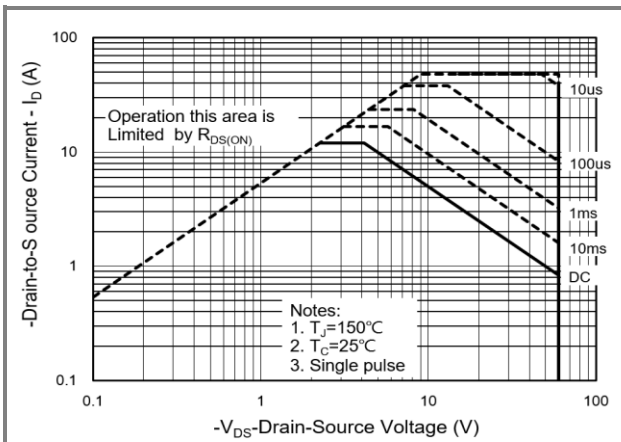


Fig.11 Maximum Safe Operating Area



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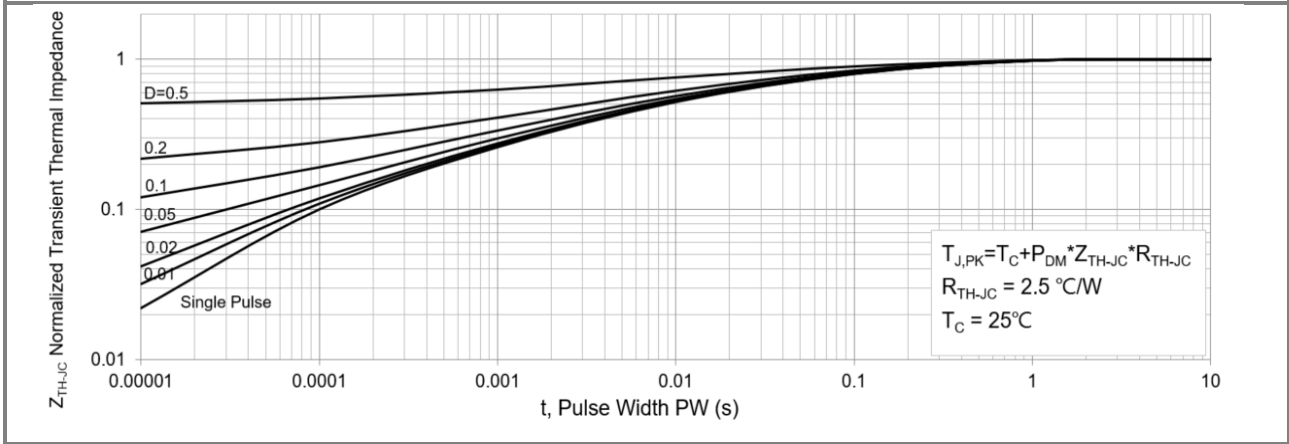
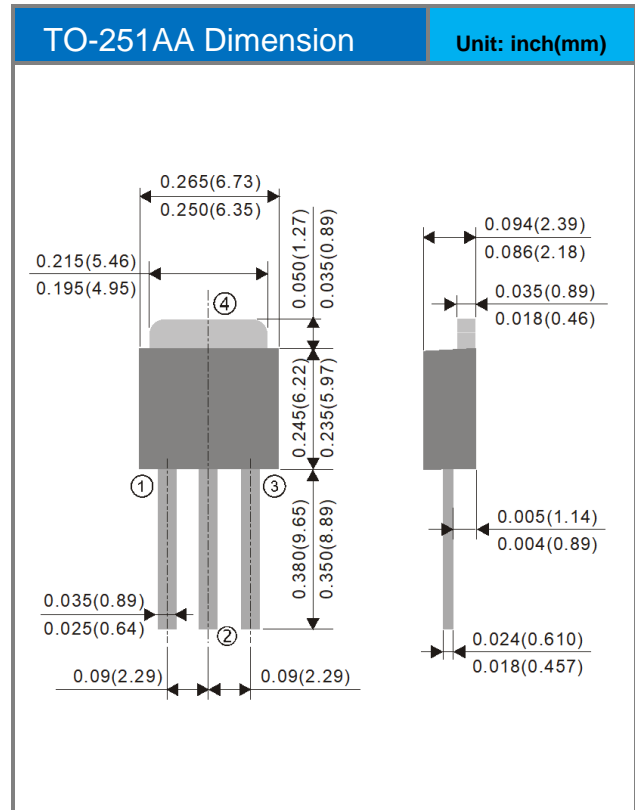
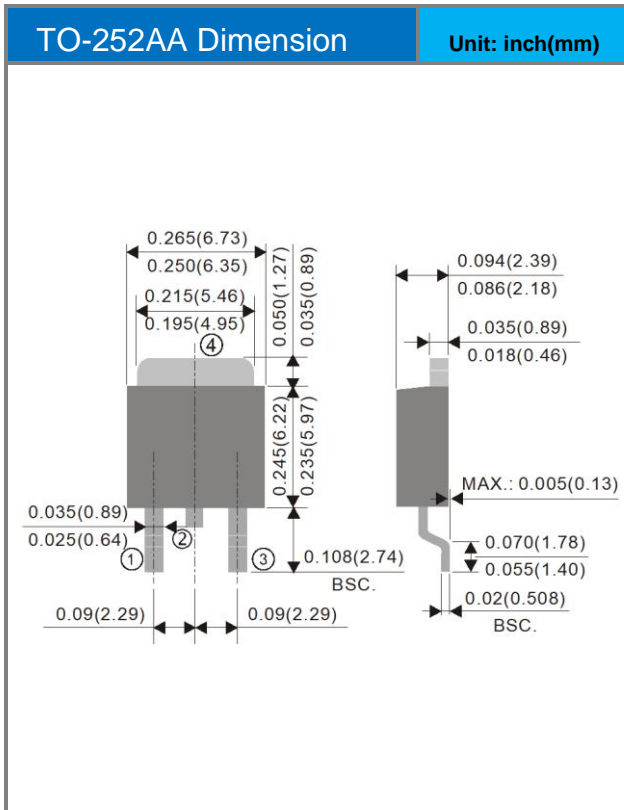


Fig.12 Normalized Thermal Transient Impedance



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## Packaging Information



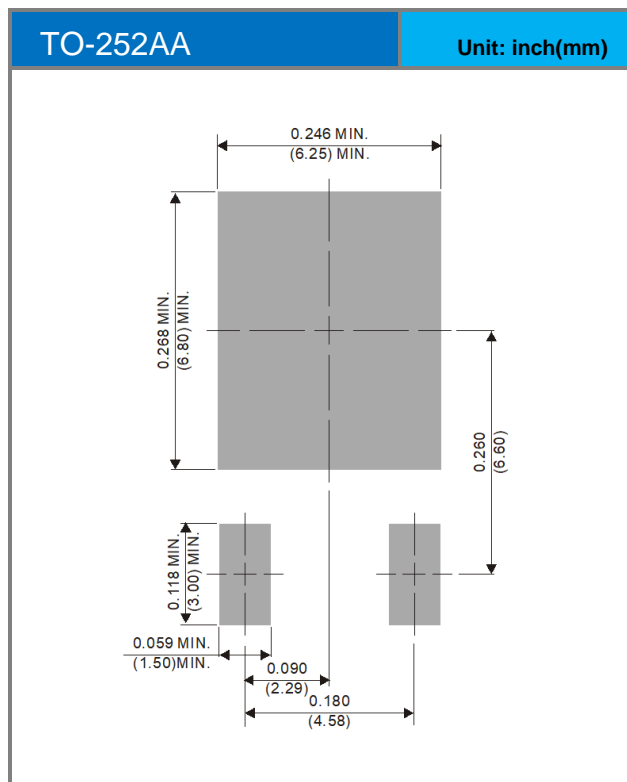


# PJU12P06 / PJD12P06

## Part No Packing Code Version

Part No Packing Code	Package Type	Packing Type	Marking	Version
PJU12P06_TO_00001	TO-251AA	80pcs / Tube	U12P06	Halogen free
PJD12P06_L2_00001	TO-252AA	3,000pcs / 13" reel	D12P06	Halogen free

## Mounting Pad Layout





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