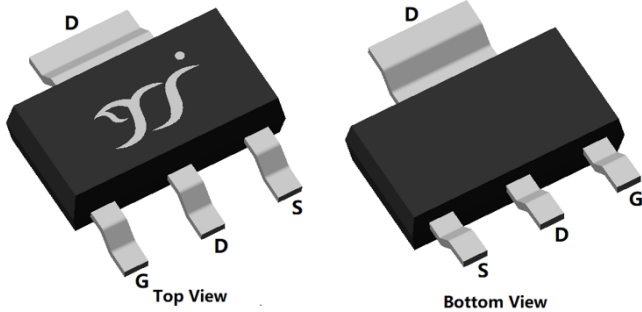
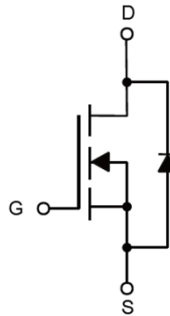


## N-Channel Enhancement Mode Field Effect Transistor



**SOT-223**



### Product Summary

- $V_{DS}$  60V
- $I_D$  5.0A
- $R_{DS(ON)}$ ( at  $V_{GS}= 10V$ ) <44mohm
- $R_{DS(ON)}$ ( at  $V_{GS}= 4.5V$ ) <49mohm

### General Description

- Trench Power MV MOSFET technology
- High density cell design for Low  $R_{DS(ON)}$
- High Speed switching
- Moisture Sensitivity Level 3
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

### Applications

- Battery protection
- Load switch
- Power management

### ■ Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Maximum	Unit
Drain-source Voltage	$V_{DS}$	60	V
Gate-source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current	$I_D$	$T_A=25^\circ\text{C}$ @ Steady State	5.0
		$T_A=70^\circ\text{C}$ @ Steady State	4.0
Pulsed Drain Current <sup>A</sup>	$I_{DM}$	25	A
Total Power Dissipation @ $T_A=25^\circ\text{C}$	$P_D$	2.5	W
Thermal Resistance Junction-to-Ambient @ Steady State <sup>B</sup>	$R_{\theta JA}$	50	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$

### ■ Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
YJM05N06A	F2	6005	2500	/	40000	13" reel



# YJM05N06A

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

Parameter	Symbol	Conditions	Min	Typ	Max	Units
<b>Static Parameter</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	60			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=60V, V_{GS}=0V$			1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$			$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.5	2.5	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=5.0A$		35	44	m $\Omega$
		$V_{GS}=4.5V, I_D=4.0A$		39	49	
Diode Forward Voltage	$V_{SD}$	$I_S=5.0A, V_{GS}=0V$		0.8	1.2	V
Maximum Body-Diode Continuous Current	$I_S$				5.0	A
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=30V, V_{GS}=0V, f=1\text{MHz}$		1018		pF
Output Capacitance	$C_{oss}$			70		
Reverse Transfer Capacitance	$C_{rss}$			62		
<b>Switching Parameters</b>						
Total Gate Charge	$Q_g$	$V_{GS}=10V, V_{DS}=30V, I_D=10A$		26		nC
Gate Source Charge	$Q_{gs}$			5.4		
Gate Drain Charge	$Q_{gd}$			6.5		
Reverse Recovery Charge	$Q_{rr}$	$I_F=20A, di/dt=500A/\mu s$		11.7		ns
Reverse Recovery Time	$t_{rr}$			23		
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=30V, I_D=2A, R_{GEN}=3\Omega$		10		ns
Turn-on Rise Time	$t_r$			20		
Turn-off Delay Time	$t_{D(off)}$			29		
Turn-off Fall Time	$t_f$			21		

A. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .

B.  $R_{\theta JA}$  is the sum of the junction-to-lead and lead-to-ambient thermal resistance, where the lead thermal reference is defined as the solder mounting surface of the drain pins.  $R_{\theta JL}$  is guaranteed by design, while  $R_{\theta JA}$  is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.



■ Typical Performance Characteristics

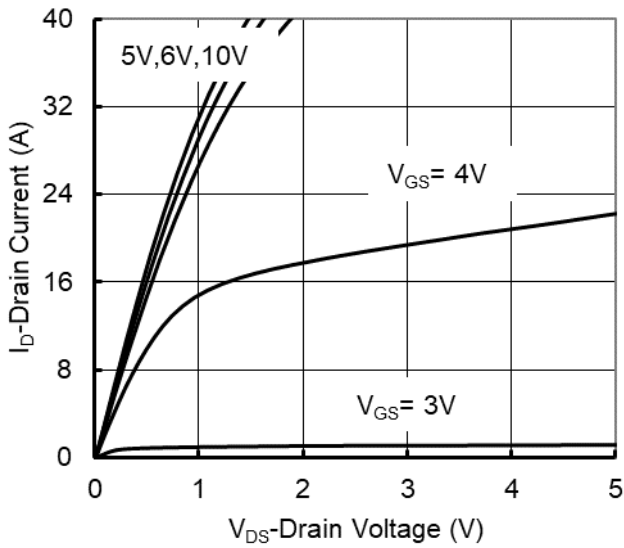


Figure 1. Output Characteristics

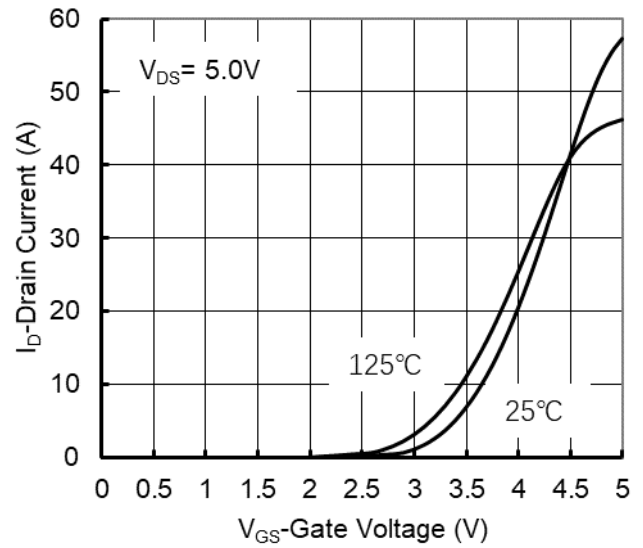


Figure 2. Transfer Characteristics

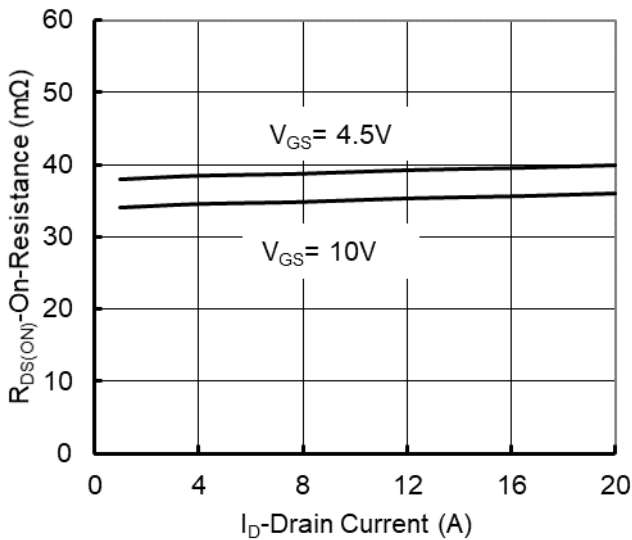


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

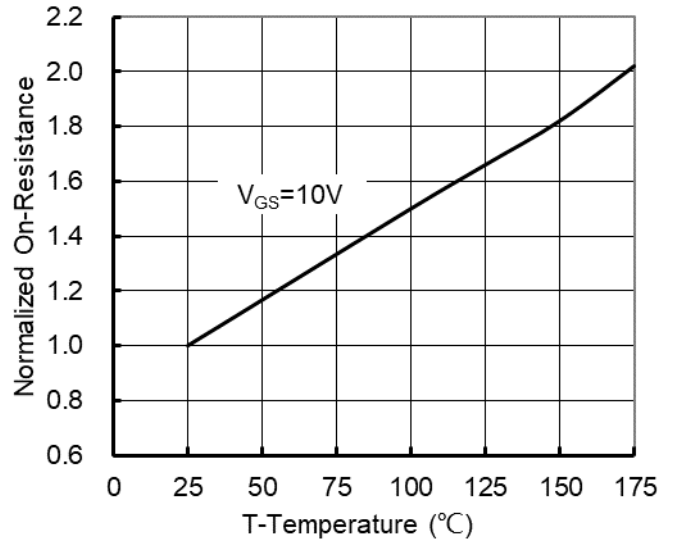


Figure 4. On-Resistance vs. Junction Temperature

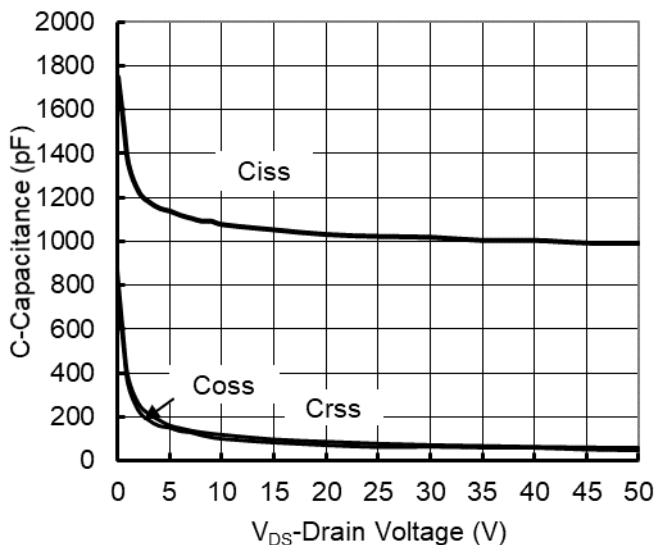


Figure 5. Capacitance Characteristics

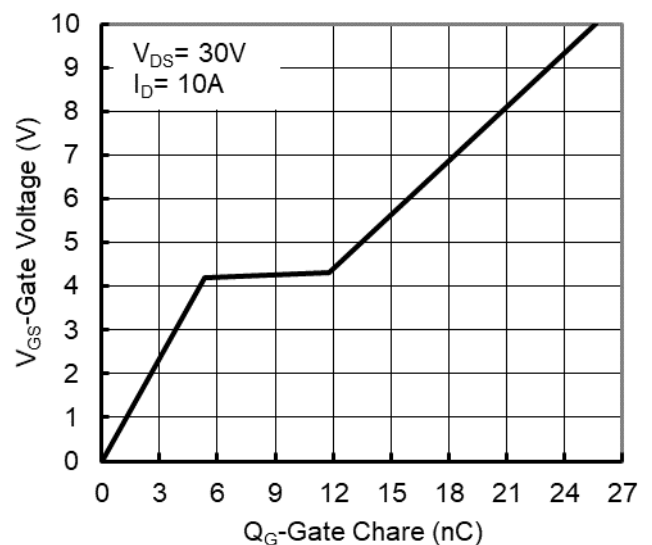


Figure 6. Gate Charge



# YJM05N06A

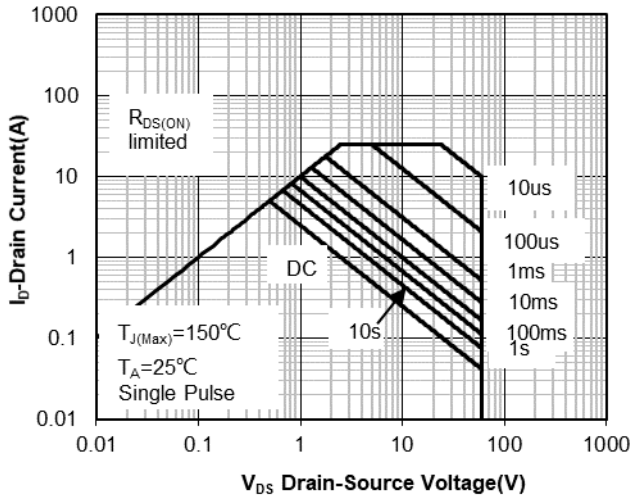


Figure 7. Safe Operation Area

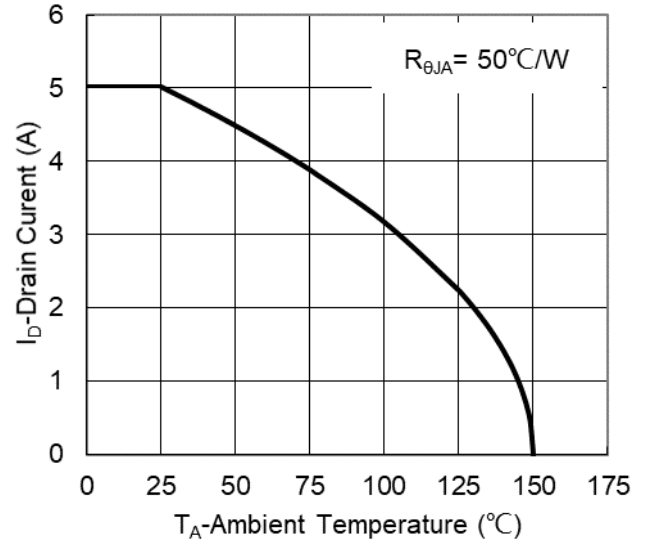


Figure 8. Maximum Continuous Drain Current vs Ambient Temperature

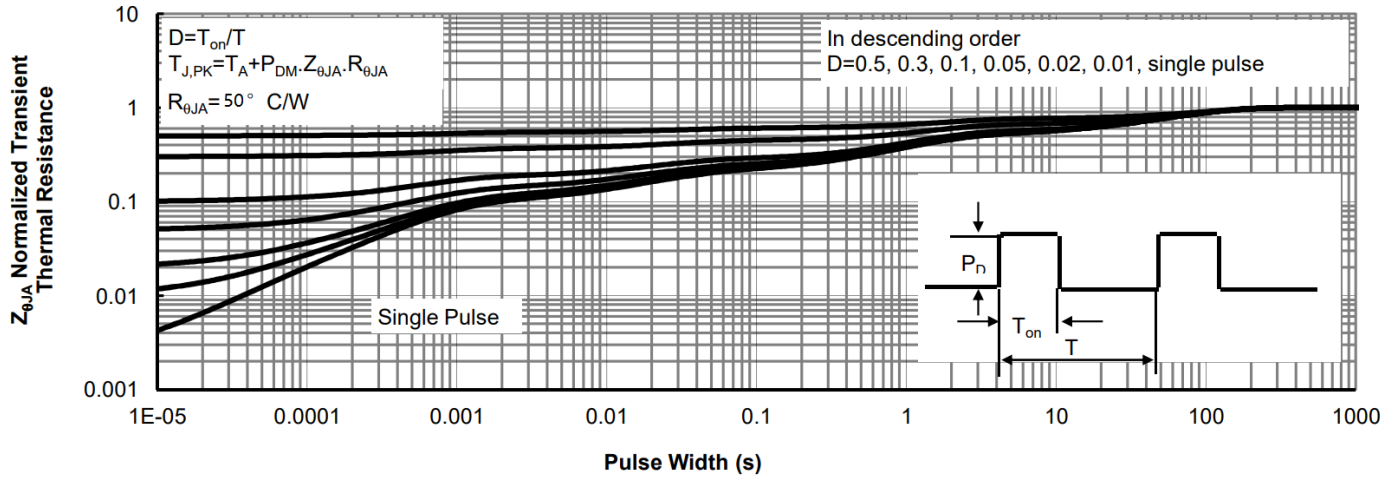
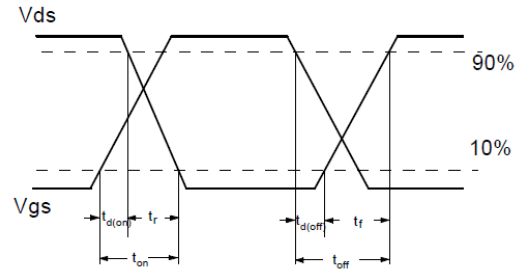
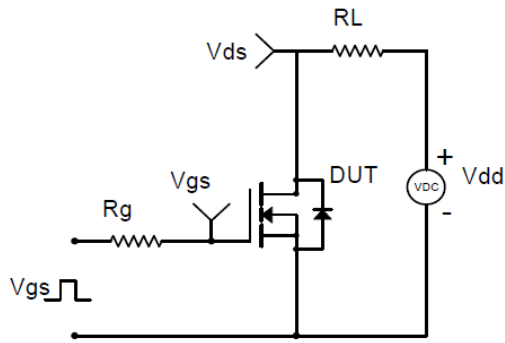
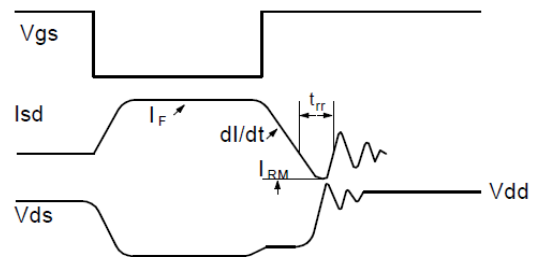
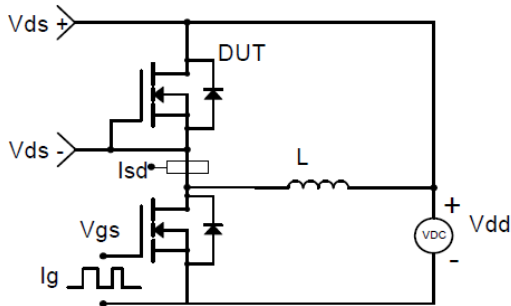


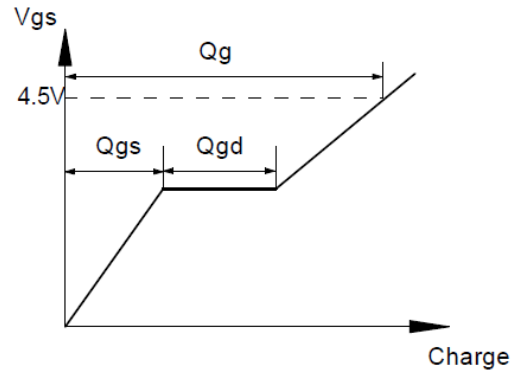
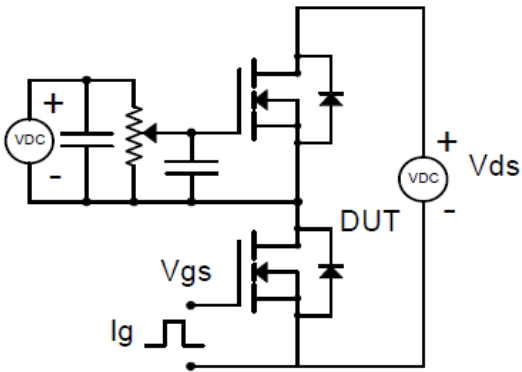
Figure 9. Normalized Maximum Transient Thermal Impedance



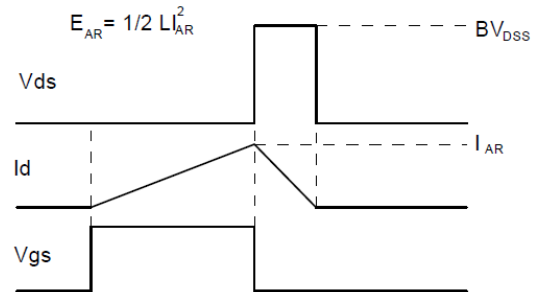
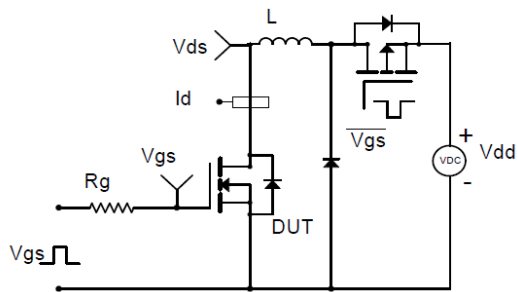
**Resistive Switching Test Circuit & Waveforms**



**Diode Recovery Test Circuit & Waveforms**



**Gate Charge Test Circuit & Waveform**

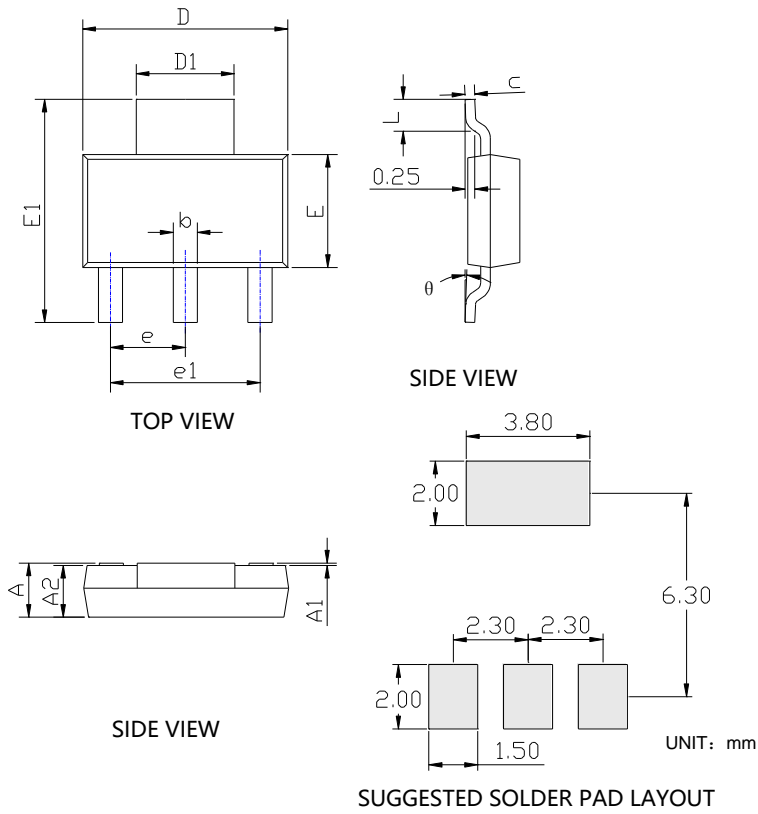


**Unclamped Inductive Switching (UIS) Test Circuit & Waveforms**



# YJM05N06A

## ■SOT-223-B Package information



SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.060	0.071	1.520	1.800
A1	0.000	0.004	0.000	0.100
A2	0.059	0.067	1.500	1.700
b	0.026	0.032	0.660	0.820
c	0.010	0.014	0.250	0.350
D	0.244	0.252	6.200	6.400
D1	0.114	0.122	2.900	3.100
E	0.130	0.146	3.300	3.700
E1	0.269	0.278	6.830	7.070
e	0.091BSC		2.300BSC	
e1	0.177	0.185	4.500	4.700
L	0.035	0.045	0.900	1.150
$\theta$	0°	10°	0°	10°

**NOTE:**  
 1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.  
 2. TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.  
 3. THE PAD LAYOUT IS FOR REFERENCE PURPOSES ONLY.



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