

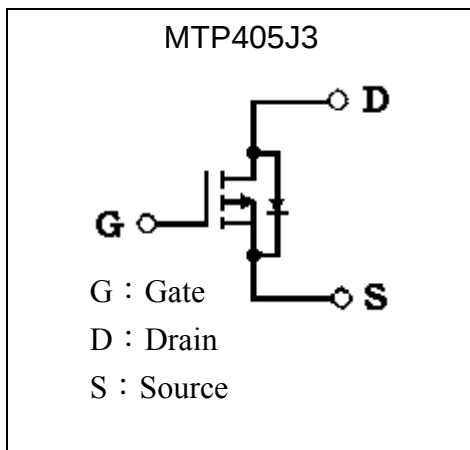
P-Channel Enhancement Mode Power MOSFET

MTP405J3

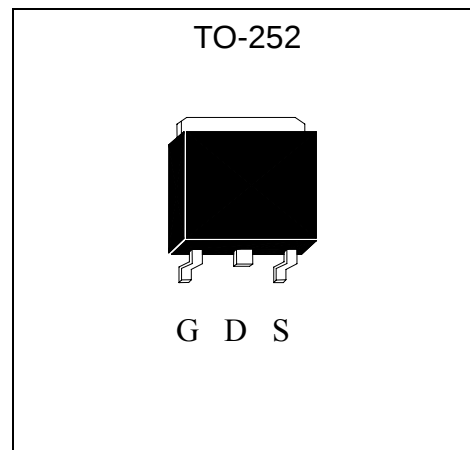
Features

- Single Drive Requirement
- Low On-resistance
- Fast switching Characteristic
- Pb-free package

Symbol



Outline



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current @ $V_{GS} = -10V$, $T_C = 25^\circ C$	I_D	-18	A
Continuous Drain Current @ $V_{GS} = -10V$, $T_C = 100^\circ C$	I_D	-14	A
Pulsed Drain Current	I_{DM}	-40 *1	A
Total Power Dissipation ($T_C = 25^\circ C$)	P_d	60	W
Linear Derating Factor		0.4	W/°C
Single Pulse Avalanche Energy	E_{AS}	61 *2	mJ
Single Pulse Avalanche Current	I_{AS}	-35	A
Operating Junction and Storage Temperature	T_j, T_{stg}	-55~+175	°C

Note : *1. Pulse width limited by safe operating area

*2 . $T_j = 25^\circ C$, $V_{DD} = 25V$, $L = 0.1mH$, $R_G = 25\Omega$

**Thermal Data**

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{th,j-c}$	2.5	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{th,j-a}$	50	°C/W

Characteristics (Tj=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	-30	-	-	V	V _{GS} =0, I _D =-250μA
V _{GS(th)}	-1.2	-	-2.4	V	V _{DS} = V _{GS} , I _D =-250μA
G _{FS}	-	17	-	S	V _{DS} =-5V, I _D =-18A
I _{GSS}	-	-	±100	nA	V _{GS} =±20
I _{DSS}	-	-	-1	μA	V _{DS} =-30V, V _{GS} =0
I _{DSS}	-	-	-5	μA	V _{DS} =-24V, V _{GS} =0, T _j =55°C
*R _{DS(ON)}	-	-	32	mΩ	V _{GS} =-10V, I _D =-18A
*R _{DS(ON)}	-	-	60	mΩ	V _{GS} =-4.5V, I _D =-10A
Dynamic					
*Q _g	-	18.7	23	nC	I _D =-18A, V _{DS} =-15V, V _{GS} =-10V
*Q _{gs}	-	2.54	-		
*Q _{gd}	-	5.4	-		
*t _{d(ON)}	-	9	13	ns	V _{DS} =-15V, V _{GS} =-10V, R _G =3 Ω , R _L =0.82 Ω
*t _r	-	25	-		
*t _{d(OFF)}	-	20	-		
*t _f	-	12	-		
C _{iss}	-	920	1100	pF	V _{GS} =0V, V _{DS} =-15V, f=1MHz
C _{oss}	-	190	-		
C _{rss}	-	122	-		
Source-Drain Diode					
*V _{SD}	-	-	-1	V	I _S =-1A, V _{GS} =0V
*I _S	-	-	-18	A	V _D =V _G =0, V _S =-1V
*t _{rr}	-	21.4	-	ns	I _S =-18A, V _{GS} =0, dI/dt=100A/μs
*Q _{rr}	-	13	-	nC	

*Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$ **Ordering Information**

Device	Package	Shipping	Marking
MTP405J3	TO-252 (Pb-free)	2500 pcs / Tape & Reel	405

Characteristic Curves

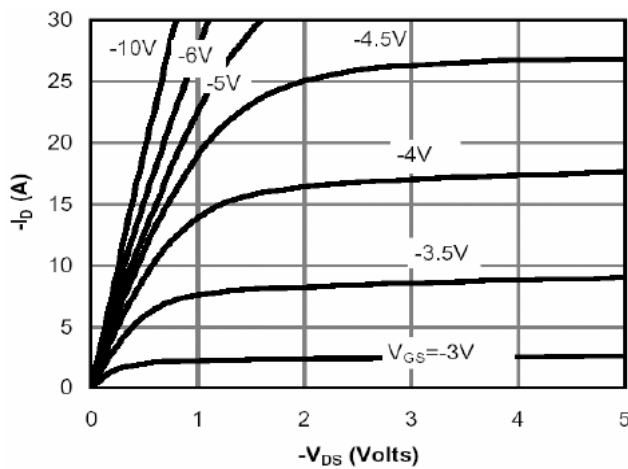


Fig 1. Typical Output Characteristics

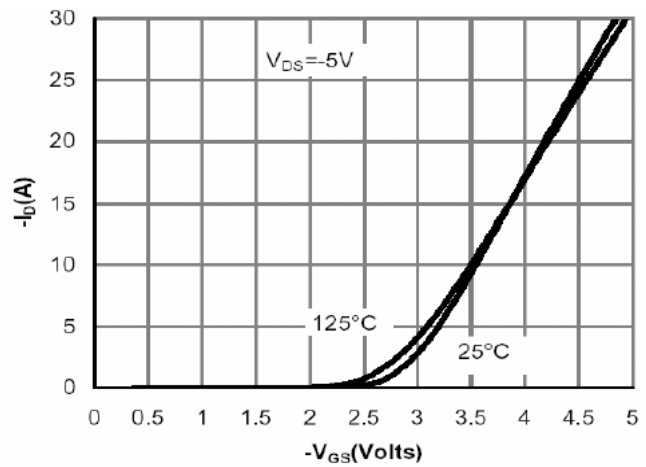


Fig 2. Transfer Characteristics

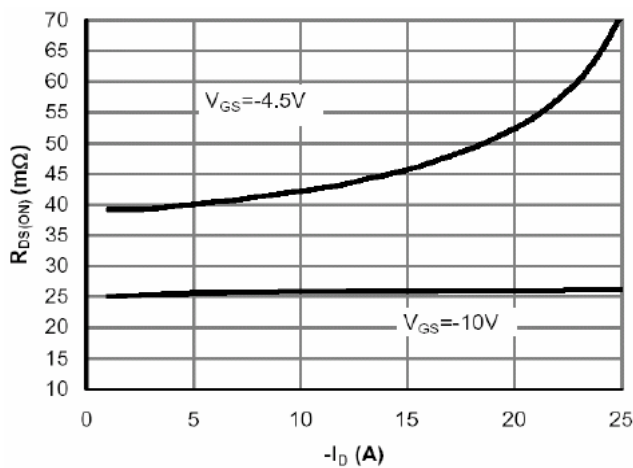


Fig 3. On-Resistance v.s. Drain Current and Gate Voltage

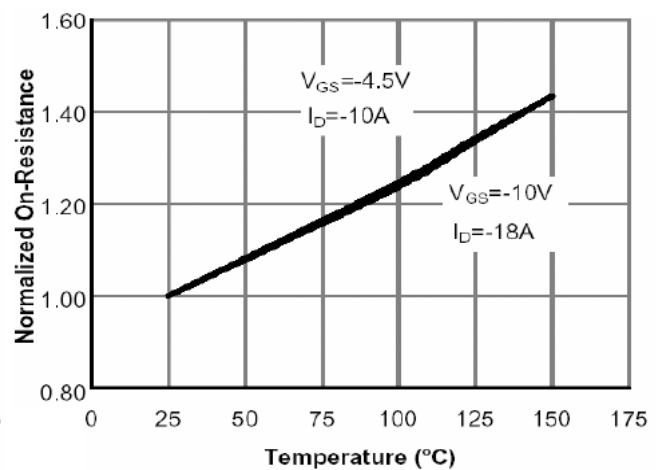


Fig 4. On-Resistance v.s. Junction Temperature

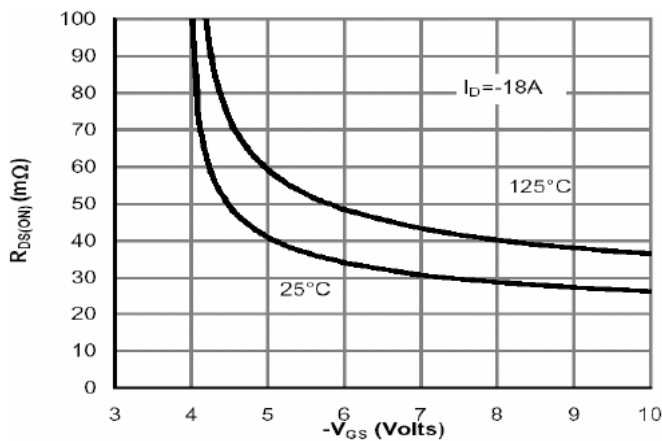


Fig 5. On-Resistance v.s. Gate-Source Voltage

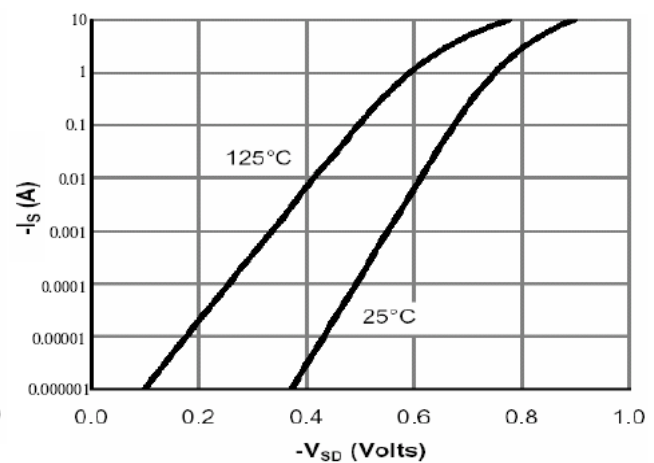


Fig 6. Body Diode Characteristics

Characteristic Curves(Cont.)

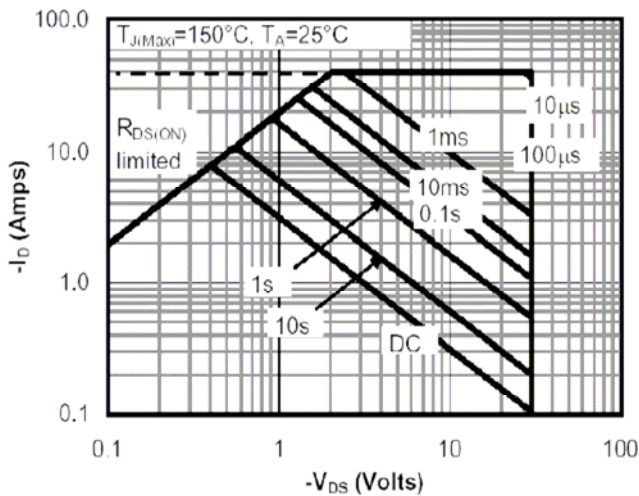


Fig 7. Maximum Safe Operating Area

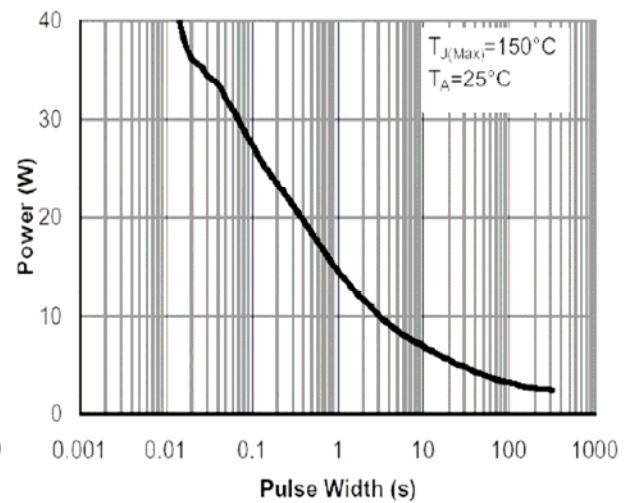


Fig 8. Single Pulse Power Rating
Junction-to-Ambient

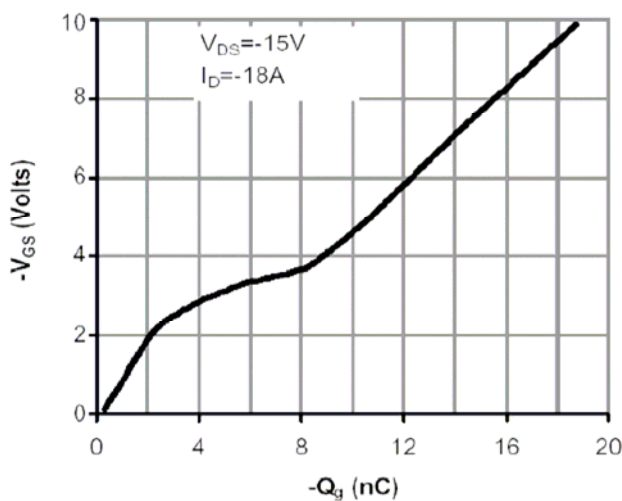


Fig 9. Gate Charge Characteristics

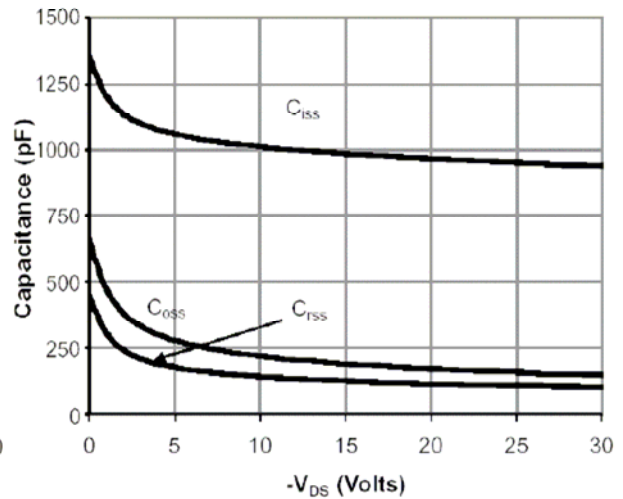


Fig 10. Typical Capacitance Characteristics

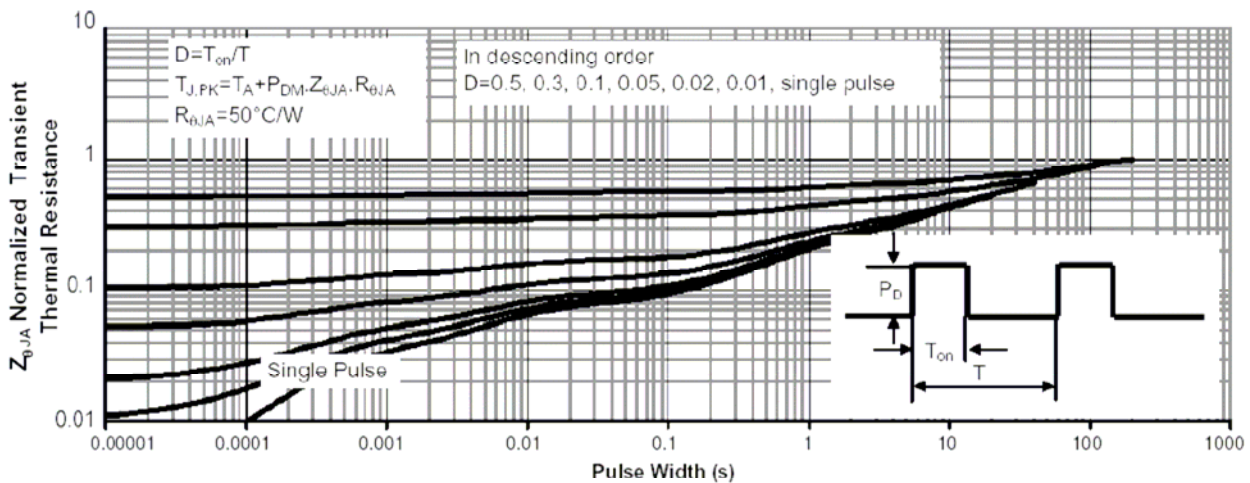
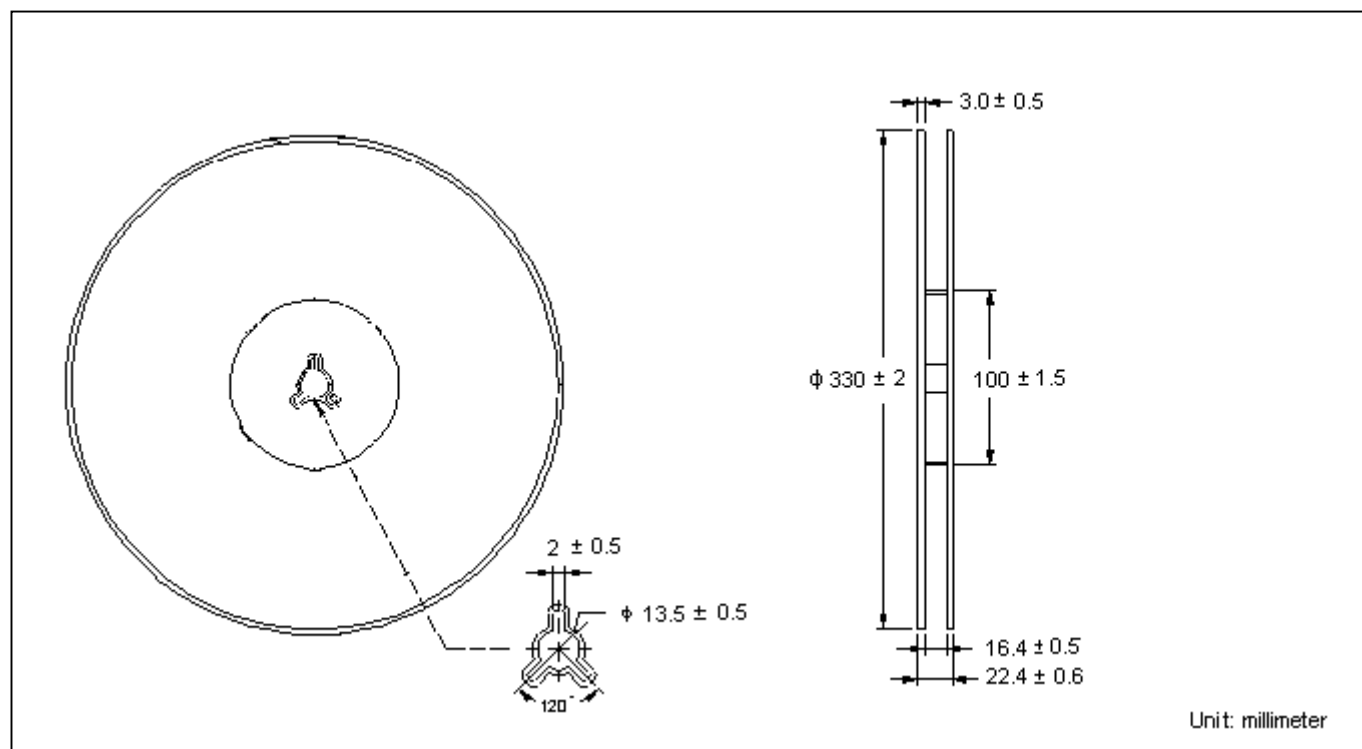
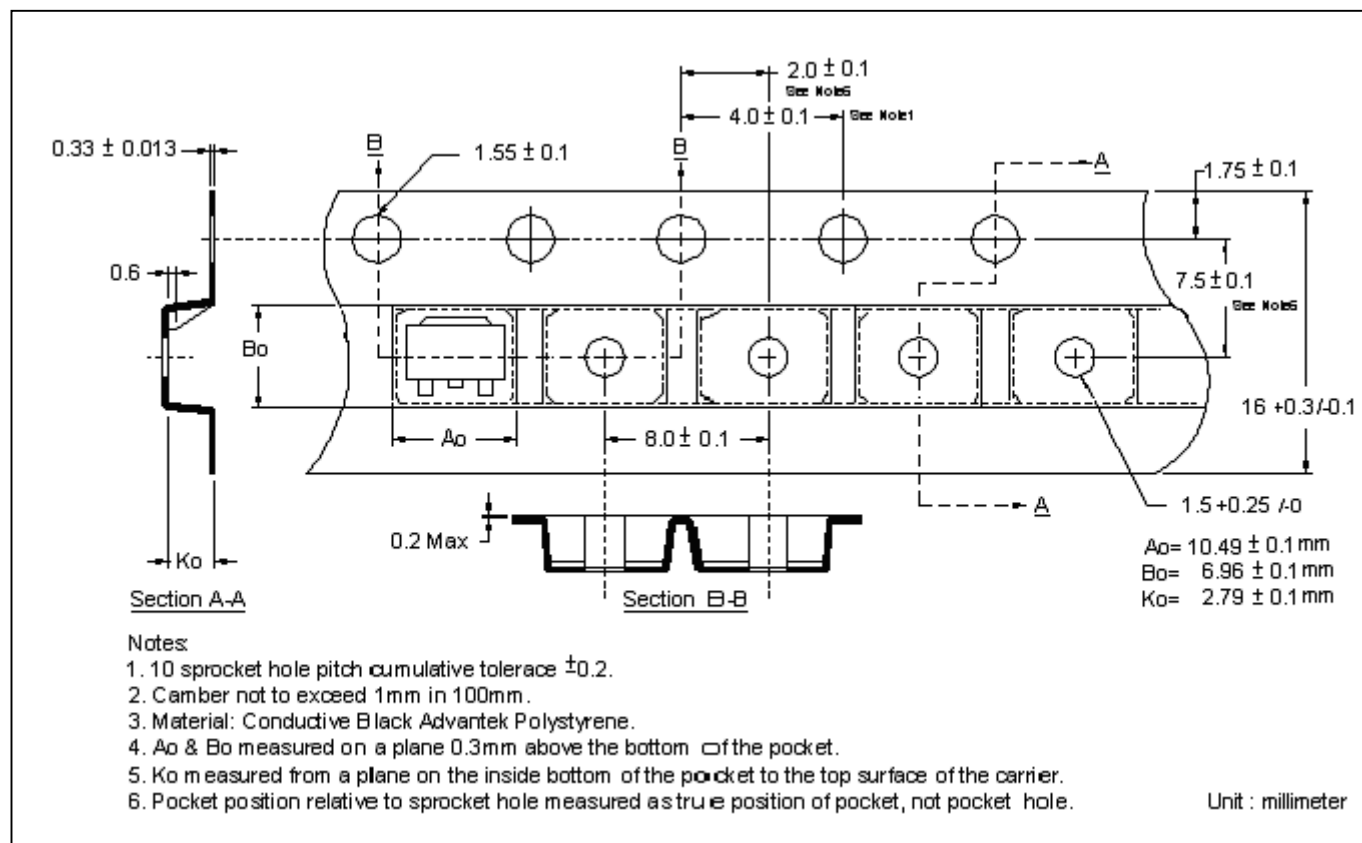


Fig 11. Normalized Maximum Transient Thermal Impedance

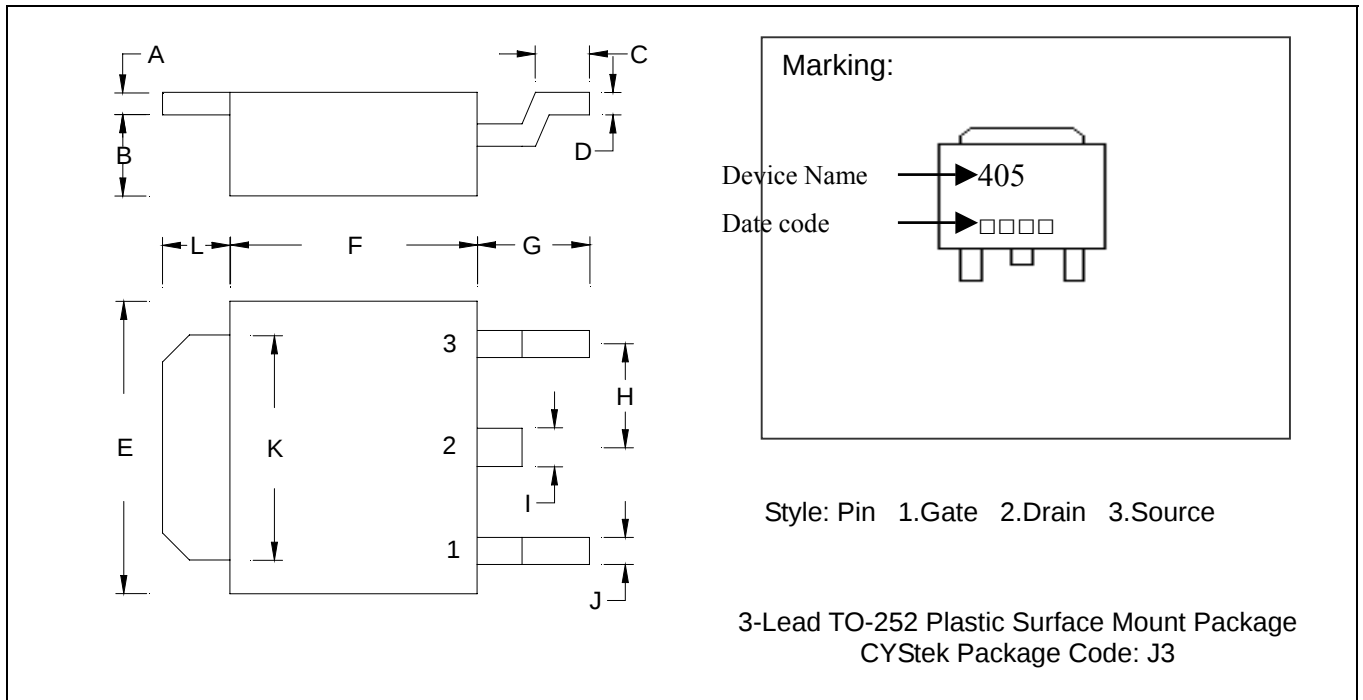
Reel Dimension



Carrier Tape Dimension



TO-252 Dimension



*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.0177	0.0217	0.45	0.55	G	0.0866	0.1102	2.20	2.80
B	0.0650	0.0768	1.65	1.95	H	-	*0.0906	-	*2.30
C	0.0354	0.0591	0.90	1.50	I	-	0.0354	-	0.90
D	0.0177	0.0236	0.45	0.60	J	-	0.0315	-	0.80
E	0.2520	0.2677	6.40	6.80	K	0.2047	0.2165	5.20	5.50
F	0.2125	0.2283	5.40	5.80	L	0.0551	0.0630	1.40	1.60

Notes: 1.Controlling dimension: millimeters.

2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.

3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material:

- Lead: 42 Alloy; solder plating
- Mold Compound: Epoxy resin family, flammability solid burning class: UL94V-0

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