

Single P-channel MOSFET

ELM65103A-S

<https://www.elm-tech.com>

■General description

ELM65103A-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate threshold voltage.

■Features

- $V_{ds} = -30V$
- $I_d = -4.5A$ ($V_{gs} = -10V$)
- $R_{ds(on)} = 41m\Omega$ ($V_{gs} = -10V$)
- $R_{ds(on)} = 60m\Omega$ ($V_{gs} = -4.5V$)

■Maximum absolute ratings

$T_a = 25^\circ C$. Unless otherwise noted.

Parameter		Symbol	Limit	Unit	Note
Drain-source voltage		V_{ds}	-30	V	
Gate-source voltage		V_{gs}	± 20	V	
Continuous drain current	$T_a = 25^\circ C$	I_d	-4.5	A	
	$T_a = 70^\circ C$		-3.5		
Pulsed drain current		I_{dm}	-20	A	1, 2
Power dissipation	$T_c = 25^\circ C$	P_d	1.38	W	3
	$T_c = 75^\circ C$		0.83		
Junction and storage temperature range		T_j, T_{stg}	-55 to +150	$^\circ C$	

NOTE : 1. Pulse width limited by maximum junction temperature.

2. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

3. Surface mounted on 1 in² copper pad of FR-4 board.

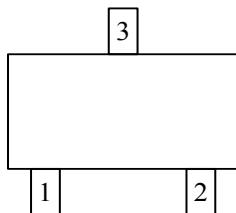
■Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit	Note
Thermal resistance, junction-to-ambient	$R_{\theta ja}$	-	90	$^\circ C/W$	

NOTE : Surface mounted on 1 in² copper pad of FR-4 board; 270 $^\circ C/W$ when mounted on minimum copper pad.

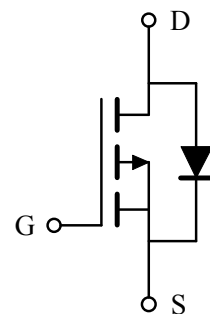
■Pin configuration

SOT-23(TOP VIEW)



Pin No.	Pin name
1	GATE
2	SOURCE
3	DRAIN

■Circuit



Single P-channel MOSFET

ELM65103A-S

<https://www.elm-tech.com>

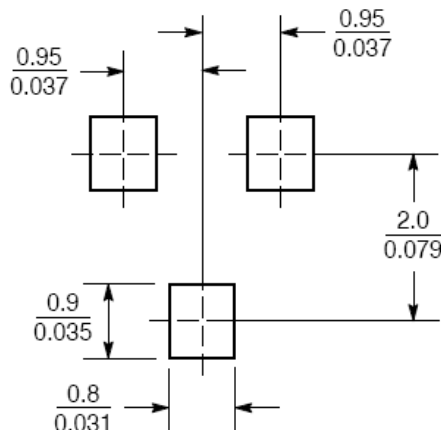
■Electrical characteristics

Ta=25°C. Unless otherwise noted.

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Id=-250μA, Vgs=0V	-30	-	-	V
Zero gate voltage drain current	Idss	Vds=-24V, Vgs=0V	-	-	-1	μA
		Vds=-24V, Vgs=0V (Ta=125°C)	-	-	-10	
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V	-	-	±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-1.2	1.8	-2.2	V
Static drain-source on-resistance *	Rds(on)	Vgs=-10V, Id=-4.5A	-	41	50	mΩ
		Vgs=-4.5V, Id=-3.5A		60	70	
Forward transconductance *	Gfs	Vds=-10V, Id=-4.5A	-	4.3	-	S
Max. body-diode continuous current *	Is				-4.5	A
Pulsed body-diode current *	Ism		-	-	-18	A
Diode forward voltage *	Vsd	Is=-1A, Vgs=0V	-	-	-1.2	V
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=-10V, f=1MHz	-	885	-	pF
Output capacitance	Coss		-	86	-	pF
Reverse transfer capacitance	Crss		-	81	-	pF
SWITCHING PARAMETERS						
Total gate charge *	Qg	Vgs=-10V, Vds=-15V Id=-4.5A	-	15	-	nC
Gate-source charge *	Qgs		-	3	-	nC
Gate-drain charge *	Qgd		-	7	-	nC
Turn-on delay time *	td(on)	Vgs=-10V, Vds=-15V Id=-1A, Rd=15Ω Rgen=6Ω	-	8	-	ns
Turn-on rise time *	tr		-	12	-	ns
Turn-off delay time *	td(off)		-	30	-	ns
Turn-off fall time *	tf		-	23	-	ns
Body diode reverse recovery time *	trr	If=-4.5A, dIf/dt=100A/μs	-	32.0		ns
Body diode reverse recovery charge *	Qrr		-	13.5	-	nC

* Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%.

■Reference land pattern

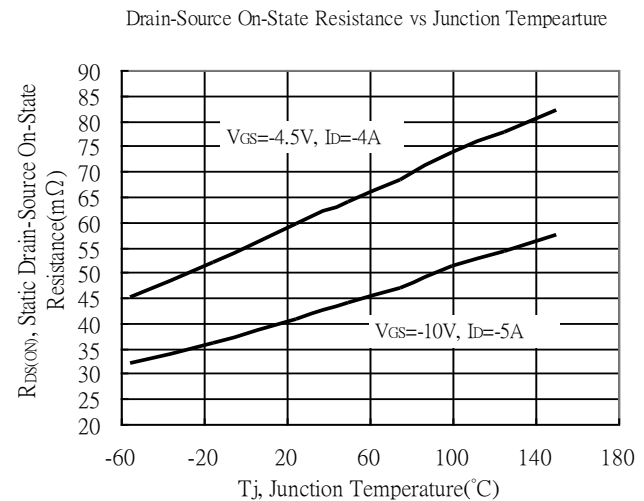
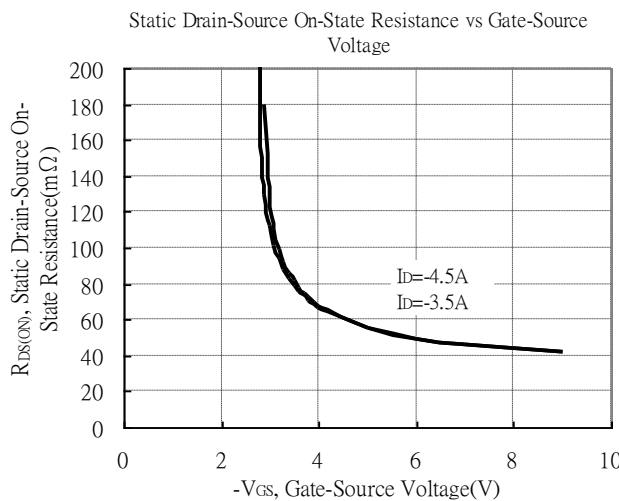
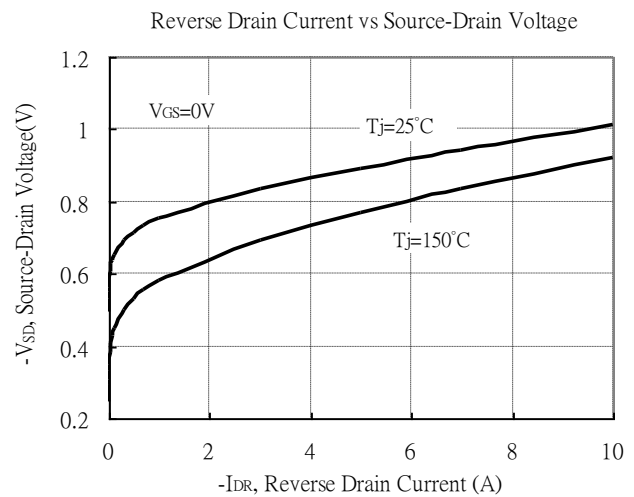
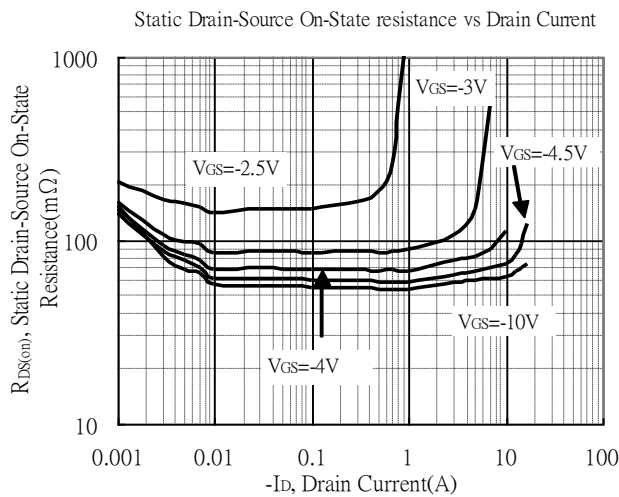
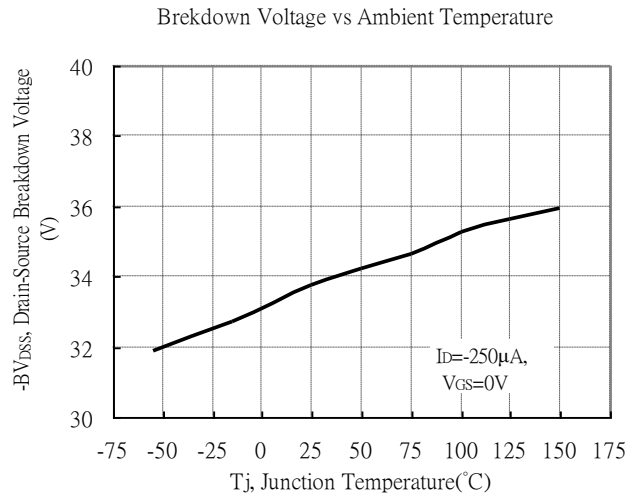
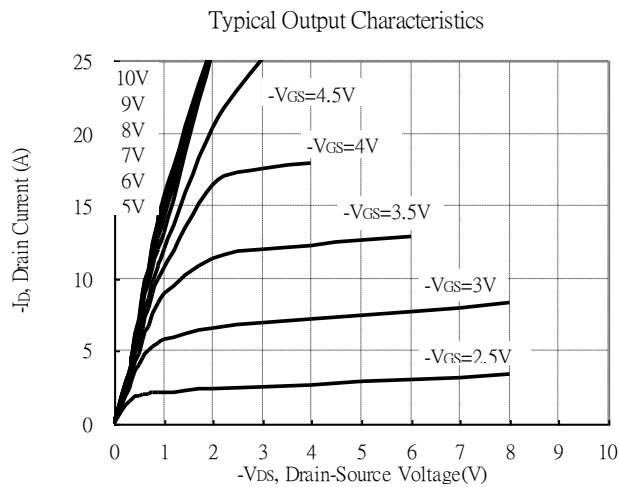


Single P-channel MOSFET

ELM65103A-S

<https://www.elm-tech.com>

■ Typical electrical and thermal characteristics

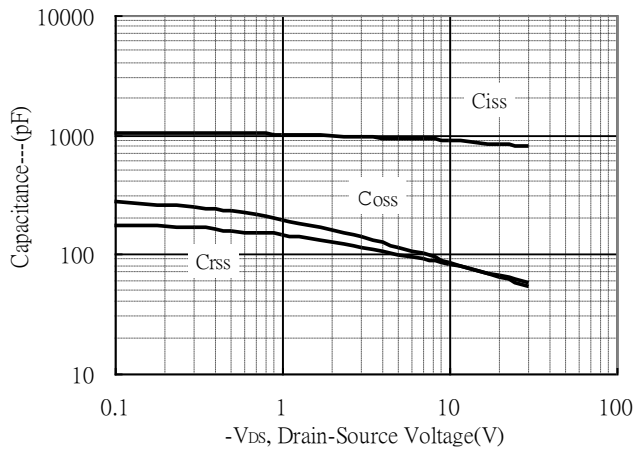


Single P-channel MOSFET

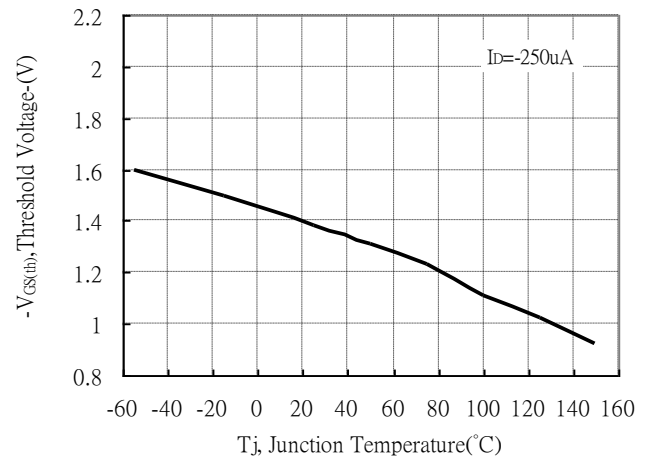
ELM65103A-S

<https://www.elm-tech.com>

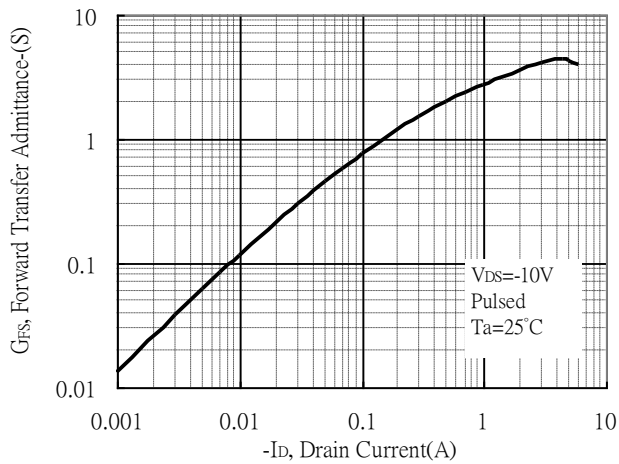
Capacitance vs Drain-to-Source Voltage



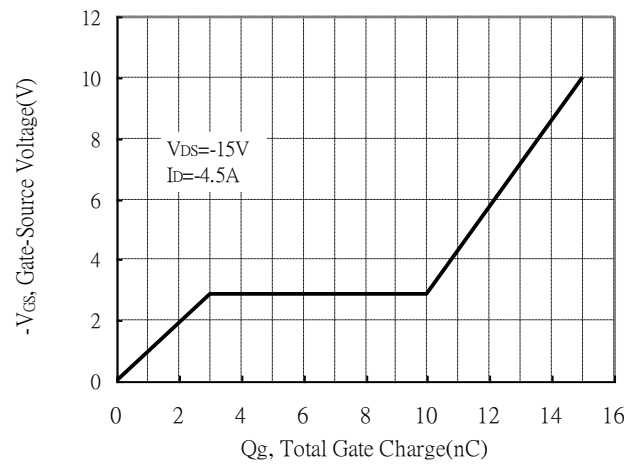
Threshold Voltage vs Junction Temperature



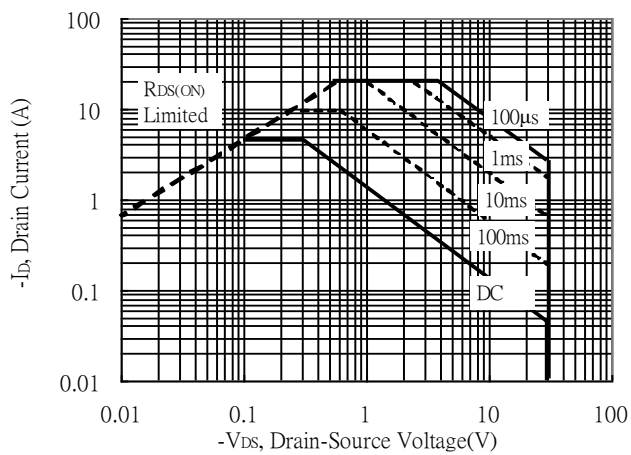
Forward Transfer Admittance vs Drain Current



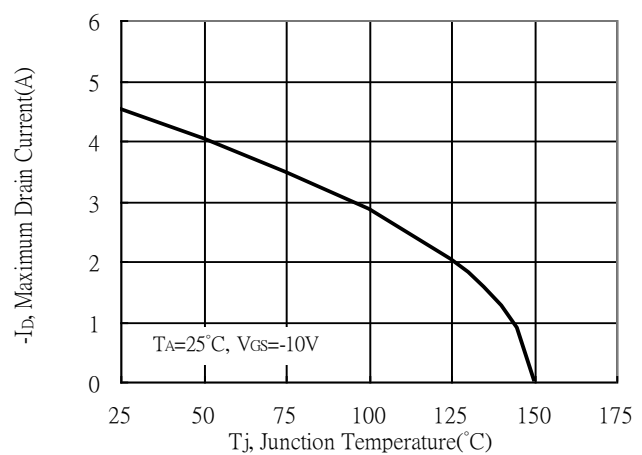
Gate Charge Characteristics



Maximum Safe Operating Area



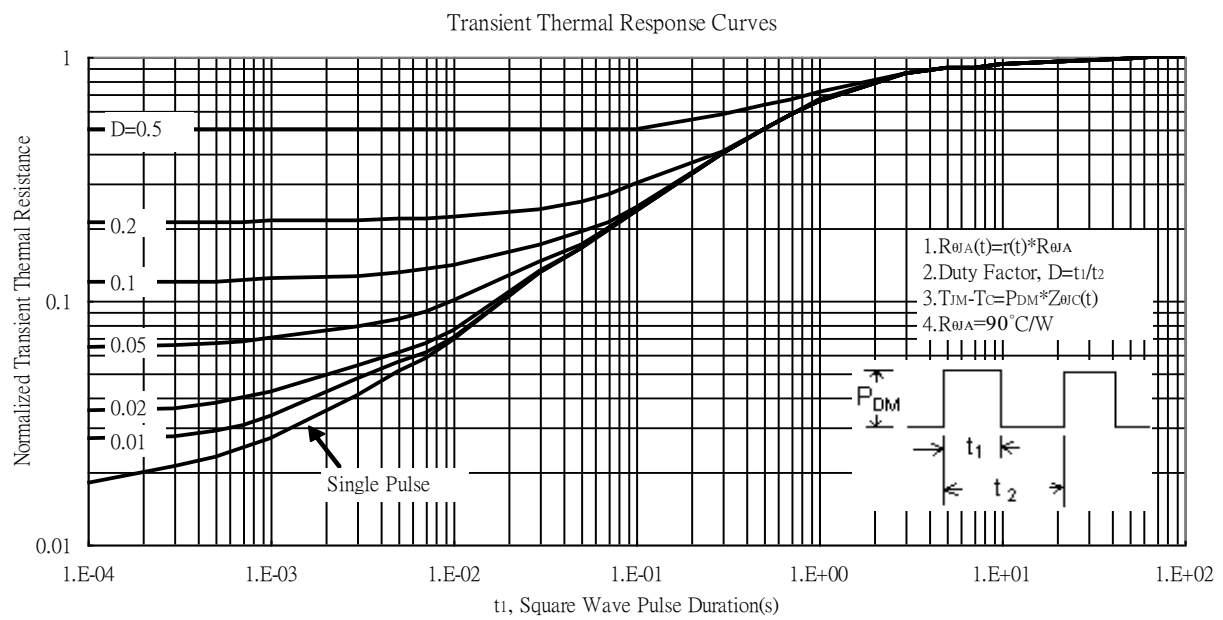
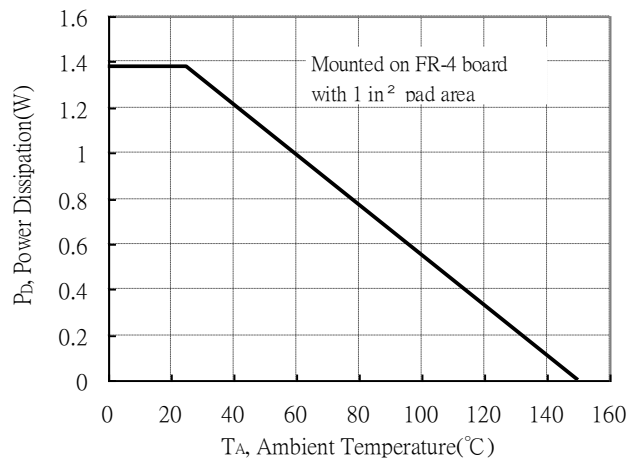
Maximum Drain Current vs Junction Temperature



Single P-channel MOSFET

ELM65103A-S

<https://www.elm-tech.com>

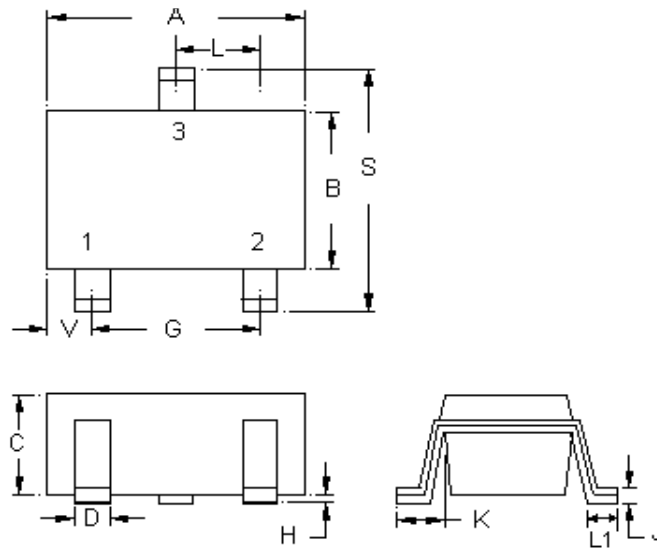


Single P-channel MOSFET

ELM65103A-S

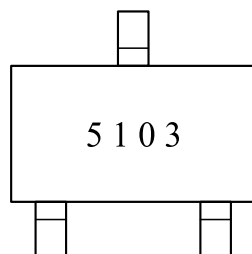
<https://www.elm-tech.com>

■SOT-23 dimension



Symbols	Millimeters		Inches		Symbols	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	2.80	3.04	0.1102	0.1204	J	0.08	0.20	0.0032	0.0079
B	1.20	1.70	0.0472	0.0669	K	0.30	0.67	0.0118	0.0266
C	0.89	1.30	0.0335	0.0512	L	0.85	1.15	0.0335	0.0453
D	0.30	0.50	0.0118	0.0197	S	2.10	2.95	0.0830	0.1161
G	1.70	2.30	0.0669	0.0910	V	0.25	0.65	0.0098	0.0256
H	0.00	0.10	0.0000	0.0040	L1	0.30	0.50	0.0118	0.0197

■Marking



Symbols	Content
5103	Product code

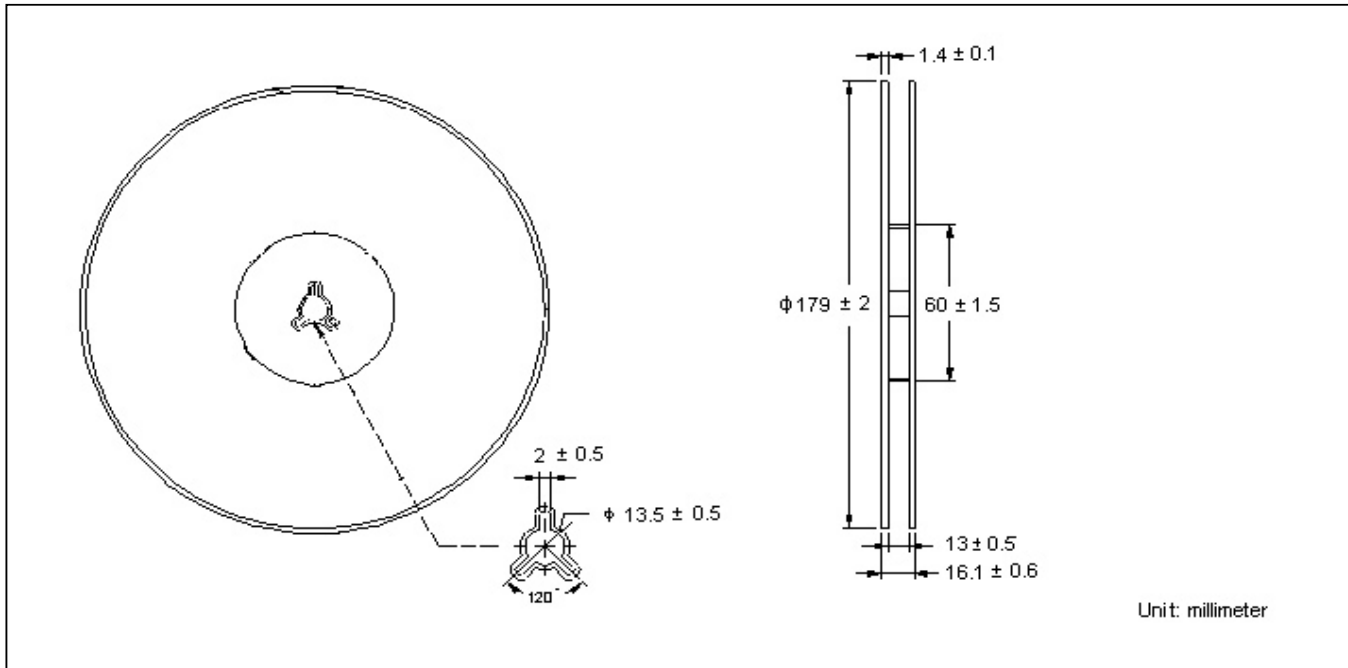
Single P-channel MOSFET

ELM65103A-S

<https://www.elm-tech.com>

■ Reel & carrier tape dimension (3,000pcs/reel)

• Reel



• Carrier tape

