

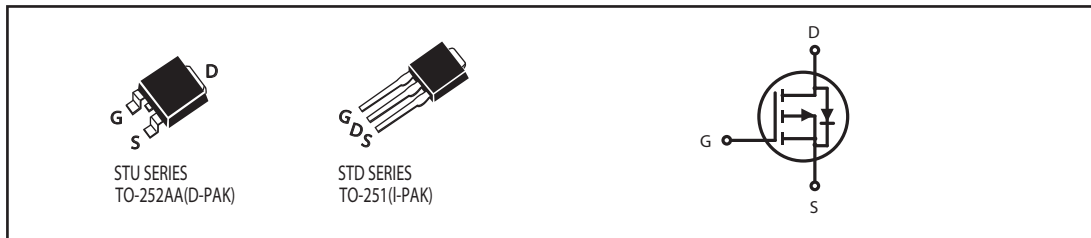


P-Channel Logic Level Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V _{DSS}	I _D	R _{DS(ON)} (mΩ) Max
-40V	-10A	45 @ V _{GS} = -10V
		60 @ V _{GS} = -4.5V

FEATURES

- Super high dense cell design for low R_{DS(ON)}.
- Rugged and reliable.
- TO-252 and TO-251 Package.



ABSOLUTE MAXIMUM RATINGS (T_A=25 C unless otherwise noted)

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	-40	V	
Gate-Source Voltage	V _{GS}	±20	V	
Drain Current-Continuous ^a @T _a	I _D	25 °C	-10	A
		70 °C	-8.3	A
-Pulsed ^b	I _{DM}	-50	A	
Drain-Source Diode Forward Current ^a	I _S	-10	A	
Maximum Power Dissipation ^a	P _D	T _a =25 °C	50	W
		T _a =70 °C	35	
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 175	°C	

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Case	R _{θC}	3	°C/W
Thermal Resistance, Junction-to-Ambient	R _{θA}	50	°C/W

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P-Channel ELECTRICAL CHARACTERISTICS (TA = 25 °C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ ^c	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = -250uA	-40			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -32V, V _{GS} = 0V			1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±100	nA
ON CHARACTERISTICS^b						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250uA	-1.0	-1.7	-3.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = -10V, I _D = -10A		34	45	m ohm
		V _{GS} = -4.5V, I _D = -6A		47	60	m ohm
On-State Drain Current	I _{D(ON)}	V _{DS} = -5V, V _{GS} = -10V	30			A
Forward Transconductance	g _{FS}	V _{DS} = -10V, I _D = -10A		11		S
DYNAMIC CHARACTERISTICS^c						
Input Capacitance	C _{ISS}	V _{DS} = -20V, V _{GS} = 0V f = 1.0MHz		900		pF
Output Capacitance	C _{OSS}			135		pF
Reverse Transfer Capacitance	C _{RSS}			85		pF
Gate resistance	R _g	V _{GS} = 0V, V _{DS} = 0V, f = 1.0MHz		3.5		ohm
SWITCHING CHARACTERISTICS^c						
Turn-On Delay Time	t _{D(ON)}	V _{DD} = -24V I _D = -10 A V _{GS} = -10V R _{GEN} = 3.3 ohm		12		ns
Rise Time	t _r			15		ns
Turn-Off Delay Time	t _{D(OFF)}			45		ns
Fall Time	t _f			26		ns
Total Gate Charge	Q _g	V _{DS} = -24V, I _D = -10A, V _{GS} = -10V		17		nC
		V _{DS} = -24V, I _D = -10A, V _{GS} = -4.5V		8		nC
Gate-Source Charge	Q _{gs}	V _{DS} = -24V, I _D = -16A		1.8		nC
Gate-Drain Charge	Q _{gd}	V _{GS} = -10V		5		nC

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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS ^a						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = -10A$		-0.91	-1.3	V

Notes

- a. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.

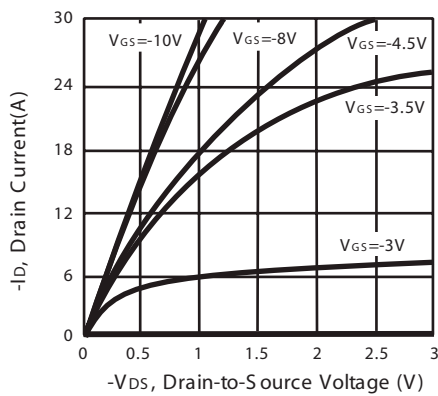


Figure 1. Output C characteristics

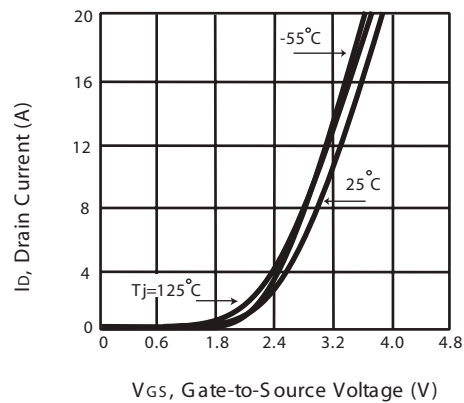


Figure 2. Transfer C characteristics

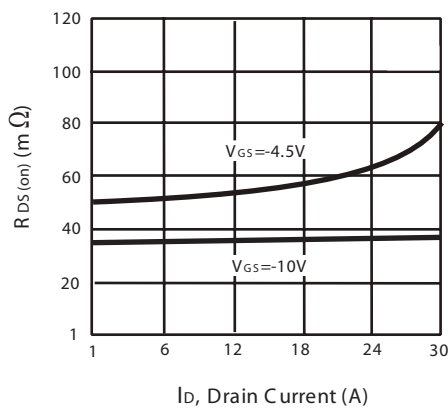


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

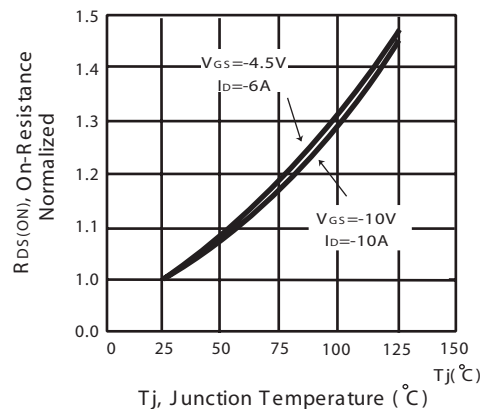


Figure 4. On-Resistance Variation with Drain Current and Temperature

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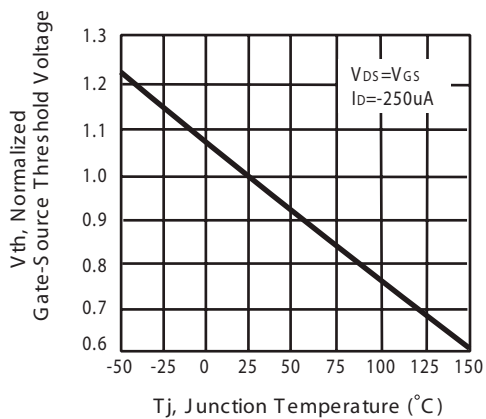


Figure 5. Gate Threshold Variation with Temperature

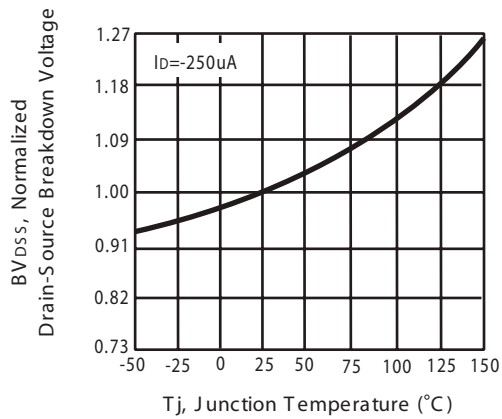


Figure 6. Breakdown Voltage Variation with Temperature

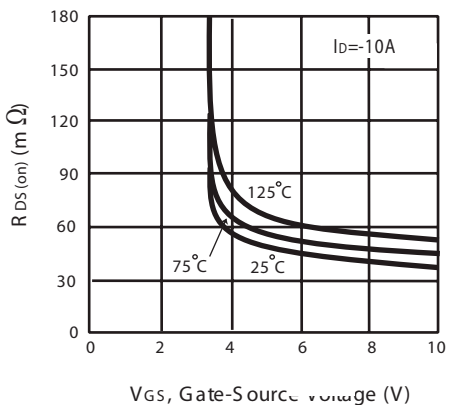


Figure 7. On-Resistance vs. Gate-Source Voltage

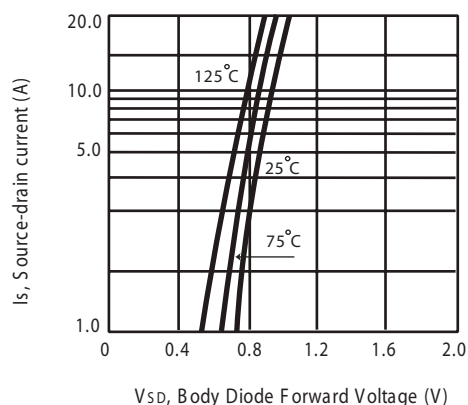


Figure 8. Body Diode Forward Voltage Variation with Source Current

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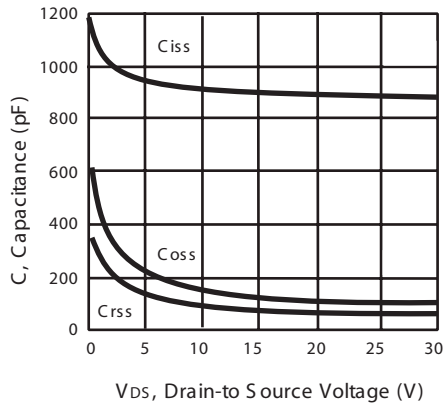


Figure 9. Capacitance

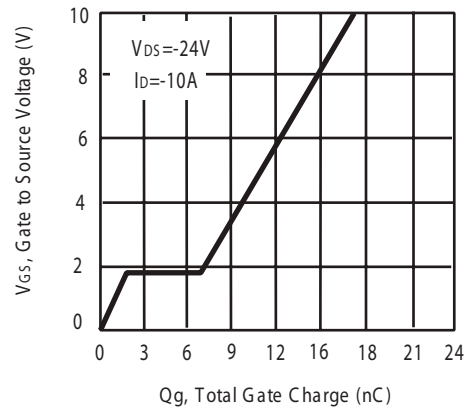


Figure 10. Gate Charge

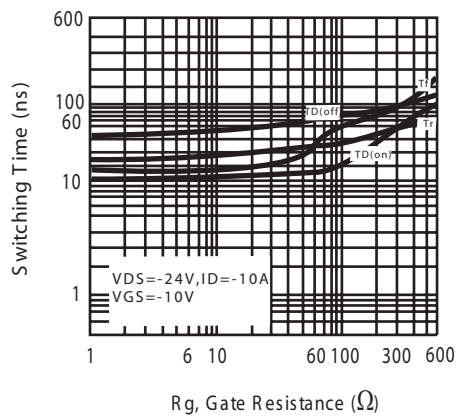


Figure 11. switching characteristics

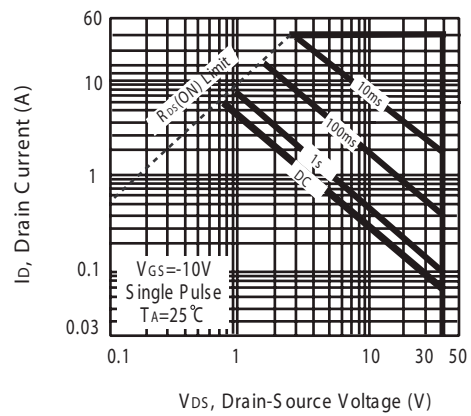


Figure 12. Maximum Safe Operating Area

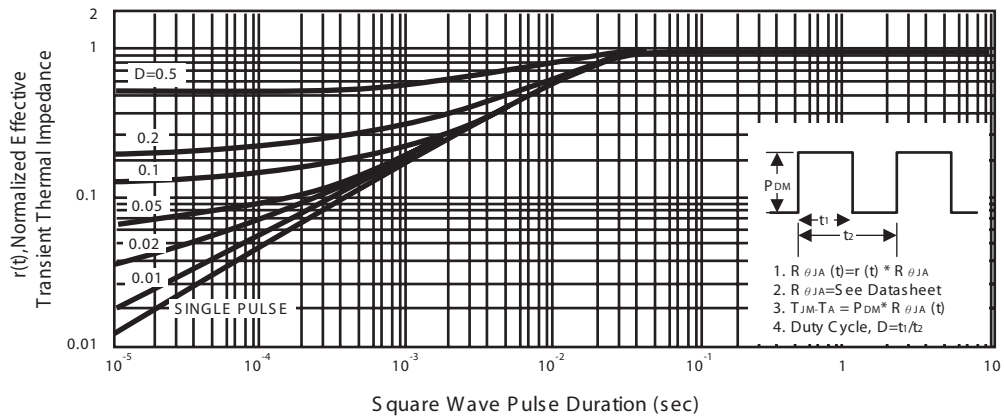
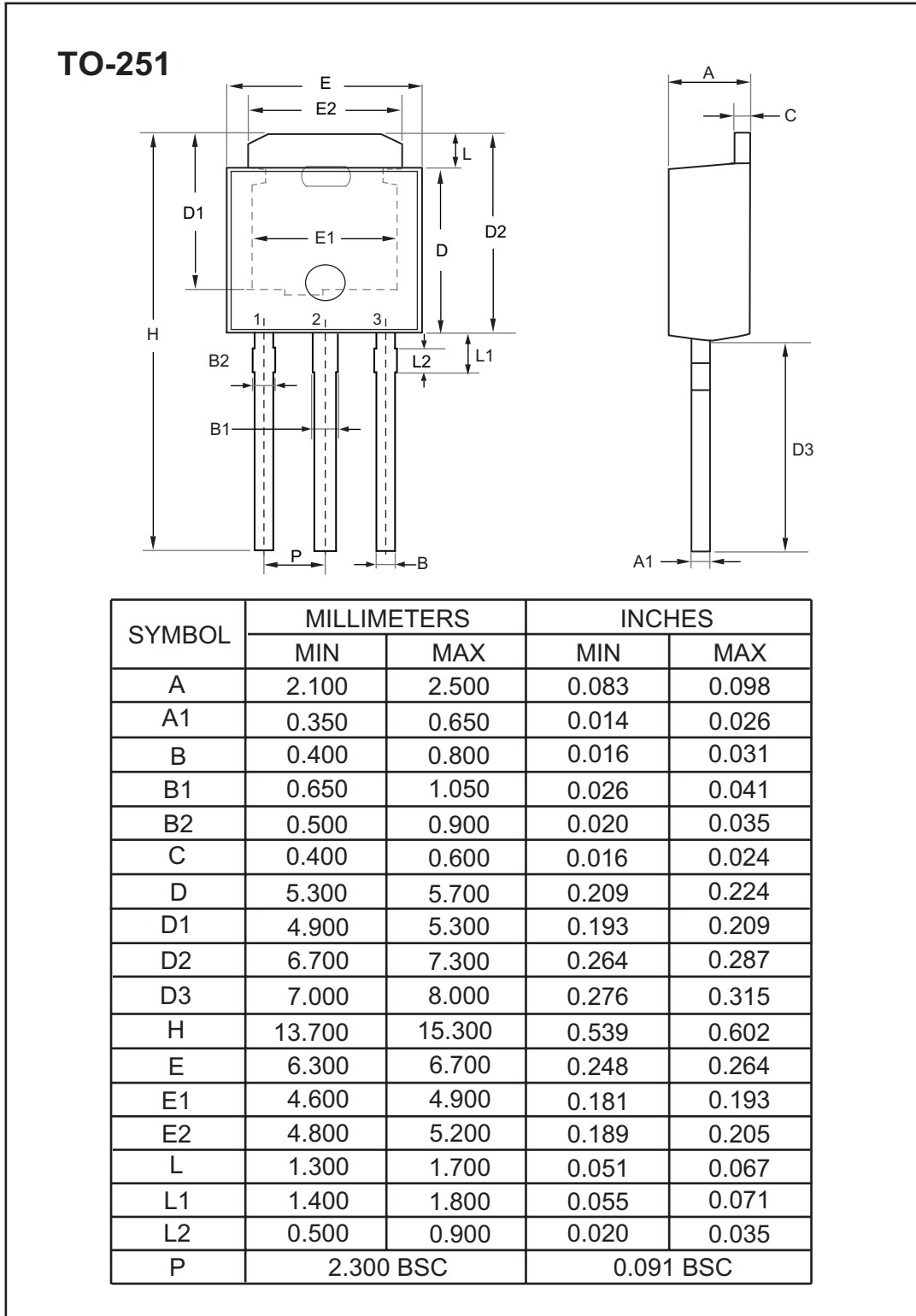


Figure 13. Normalized Thermal Transient Impedance Curve

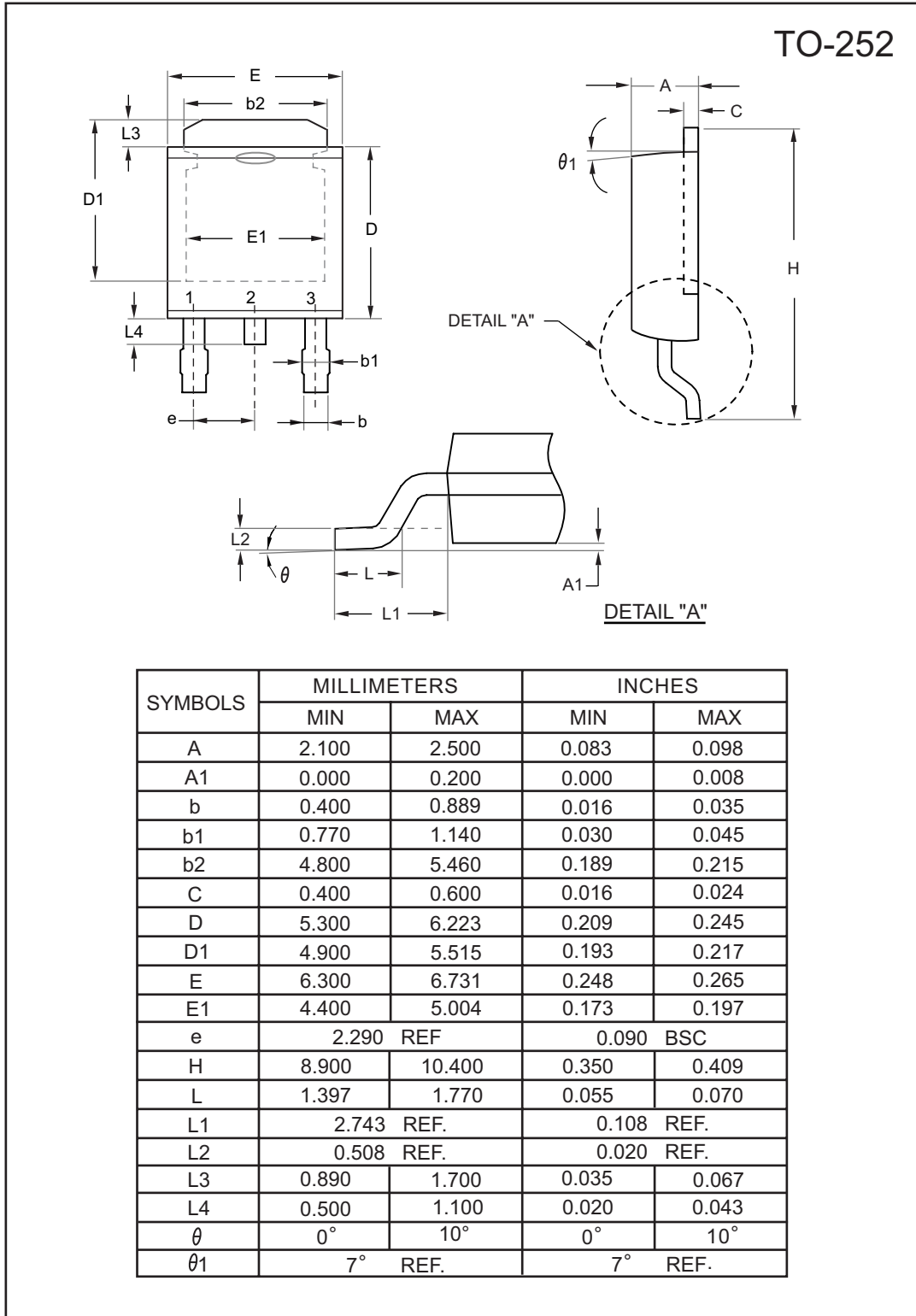
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PACKAGE OUTLINE DIMENSIONS



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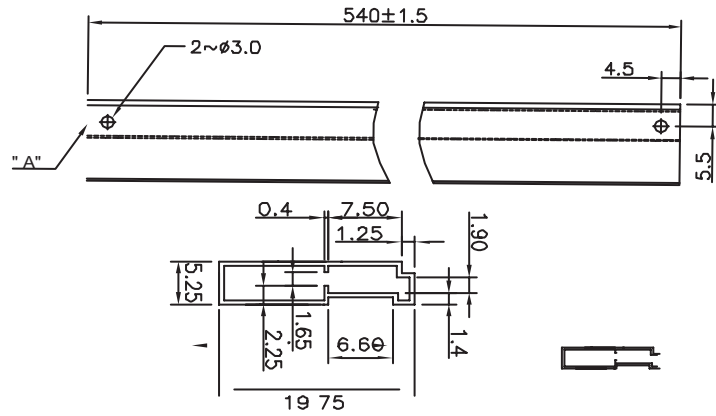
PACKAGE OUTLINE DIMENSIONS



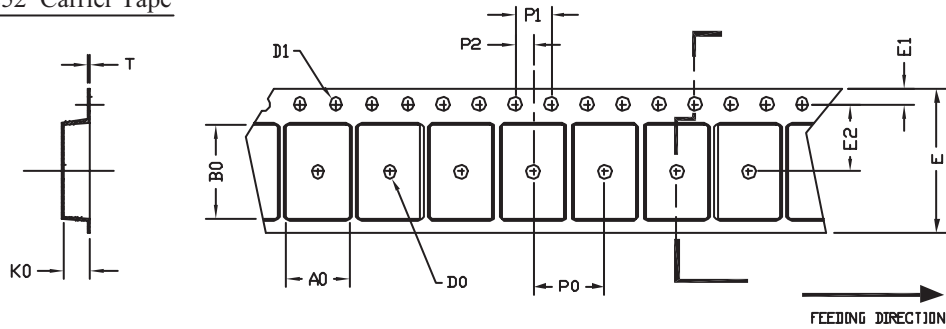
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TO251 Tube/TO-252 Tape and Reel Data

TO-251 Tube



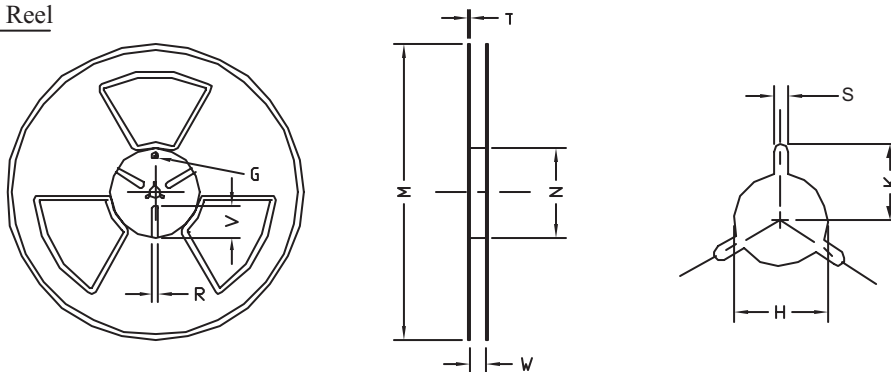
TO-252 Carrier Tape



UNIT:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
TO-252 (16 mm)	6.80 ±0.1	10.3 ±0.1	2.50 ±0.1	φ 2	φ 1.5 + 0.1 - 0	16.0 0.3±	1.75 0.1±	7.5 ±0.15	8.0 ±0.1	4.0 ±0.1	2.0 ±0.15	0.3 ±0.05

TO-252 Reel



UNIT:mm

TAPE SIZE	REEL SIZE	M	N	W	T	H	K	S	G	R	V
16 mm	φ 330	φ 330 ± 0.5	φ 97 ± 1.0	17.0 + 1.5 - 0	2.2	φ 13.0 + 0.5 - 0.2	10.6	2.0 ±0.5	---	---	---