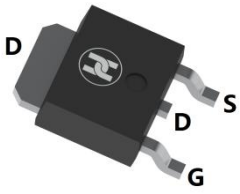
N-CHANNEL HIGH VOLTAGE MOSFET

FEATURES

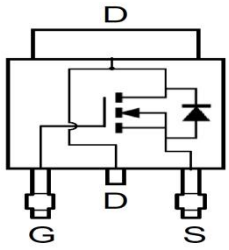
- V_{DS}=100V,$R_{DS(ON)}$≤28mΩ@V_{GS}=10V,I_D=55A
- Low $R_{DS(ON)}$ – – Minimises Power Losses
- Low Q_g – Minimises Switching Losses
- For Power Management Functions and DC-DC Converters Applications
- Surface Mount device



TO-252

MECHANICAL DATA

- Case: TO-252
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.33 grams (approximate)



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

Parameter		Symbol	Value	Unit
Drain-source voltage		V_{DS}	100	V
Gate-source voltage		V_{GS}	±20	V
Continuous drain current, V_{GS} =10V	T_C = +25°C	I_D	55	A
	T_C= +100°C		39	A
Pulsed drain current (10μs Pulse, Duty Cycle = 1%)		I_{DM}	58	A
Maximum Continuous Body Diode Forward Current (1)		I_S	2.2	A
Avalanche Current, L =0. 1mH		I_{AS}	29	A
Avalanche Energy, L =0. 1mH		E_{AS}	43	mJ
Power dissipation(1)		P_D	2.0	W
Power dissipation(2)			3.7	
Thermal resistance from Junction to ambient (1)		$R_{\theta JA}$	74	°C/W
Thermal resistance from Junction to ambient (2)			40	
Thermal Resistance, Junction to Case (1)		$R_{\theta JC}$	1.2	°C/W
Operating and Storage temperature		T_J,T_{STG}	-55 ~+175	°C

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise specified)

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Drain-Source breakdown voltage(3)	$V_{(BR)DSS}$	100			V	V_{GS}=0V, I_D=250μA
Zero gate voltage drain current(3)	I_{DSS}			1	uA	V_{DS}=100V, V_{GS}=0V
Gate-body leakage current(3)	I_{GSS}			±100	nA	V_{DS}=0V, V_{GS}=±20V
Gate-threshold voltage (3)	$V_{GS(th)}$	2.0	2.5	3.3	V	V_{DS}=V_{GS}, I_D=250μA
Drain-source on-resistance (3)	$R_{DS(ON)}$		20	28	mΩ	V_{GS}=10V, I_D=20A
Diode forward voltage (3)	V_{SD}		0.7	1.2	V	I_S=1.0A, V_{GS}=0V
Input capacitance (4)	C_{iss}		2245		pF	V_{DS}=50V, V_{GS}=0V, f=1MHz
Output capacitance(4)	C_{oss}		173		pF	
Reverse transfer capacitance(4)	C_{rss}		68		pF	
Gate Resistance(4)	R_g		1.9		Ω	V_{DS}=0V, V_{GS}=0V, f=1MHz
Turn-on delay time(4)	$t_{d(on)}$		6.4		nS	V_{DS}=50V, V_{GS}=10V I_D=20A,R_g=3.0Ω
Turn-on rise time(4)	t_r		5.8		nS	
Turn-off delay time(4)	$t_{d(off)}$		17.8		nS	
Turn-off fall time(4)	t_f		4.8		nS	
Total Gate Charge(4)	Q_g		22		nC	V_{DS}=50V,V_{GS}=6V,I_D=20A
Total gate charge(4)	Q_g		36		nC	V_{DS}=50V,V_{GS}=10V,I_D=20A
Gate-source charge(4)	Q_{gs}		7.3		nC	
Gate-drain charge(4)	Q_{gd}		9.2		nC	
Body Diode Reverse Recovery Time(4)	t_{rr}		35		nS	I_S=20A,di/dt= 100A/μs
Body Diode Reverse Recovery Charge(4)	Q_{rr}		47		nC	

Notes: 1. Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
2. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
3. Short duration pulse test used to minimize self-heating effect.
4. Guaranteed by design. Not subject to product testing.

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Typical Characteristics

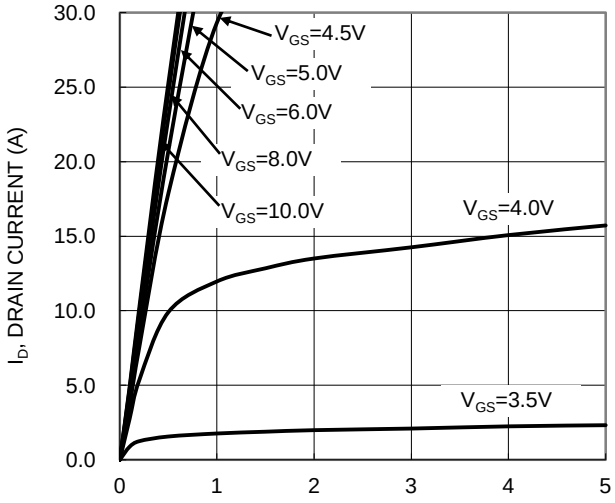

Figure 1. Typical Output Characteristic

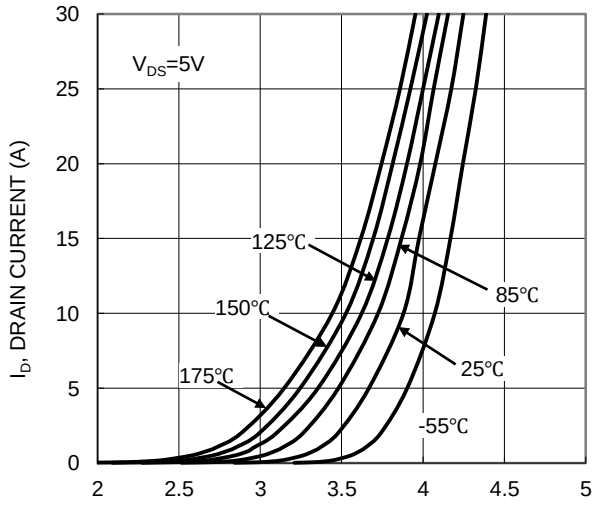

Figure 2. Typical Transfer Characteristic

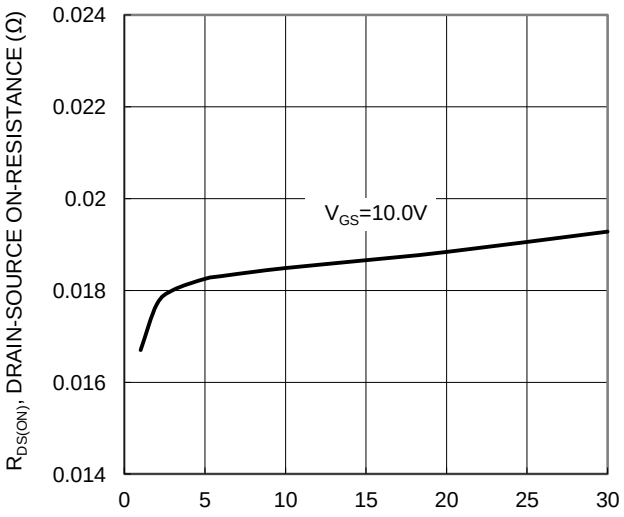

Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

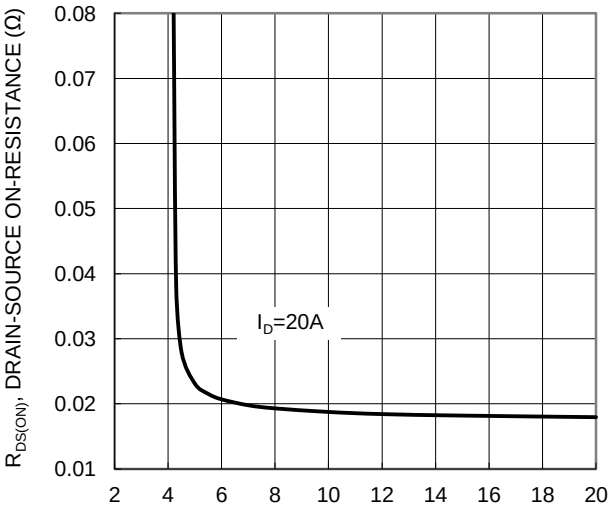

Figure 4. Typical Transfer Characteristic

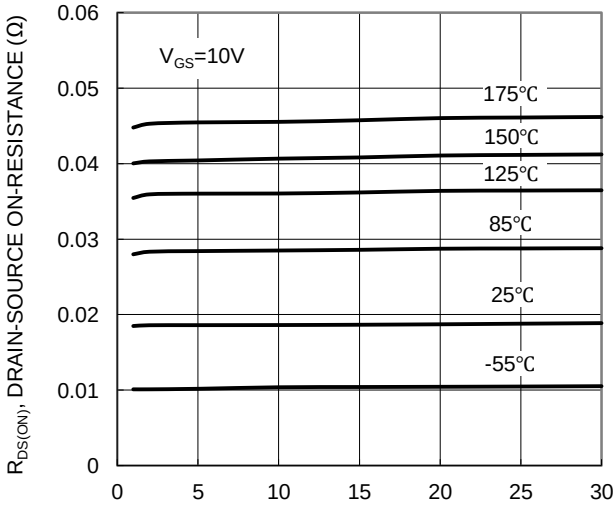

Figure 5. Typical On-Resistance vs. Drain Current and Temperature

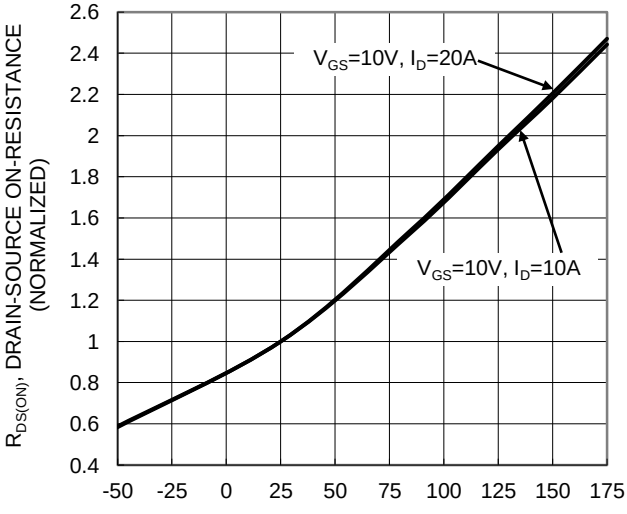

Figure 6. On-Resistance Variation with Temperature

N-CHANNEL HIGH VOLTAGE MOSFET

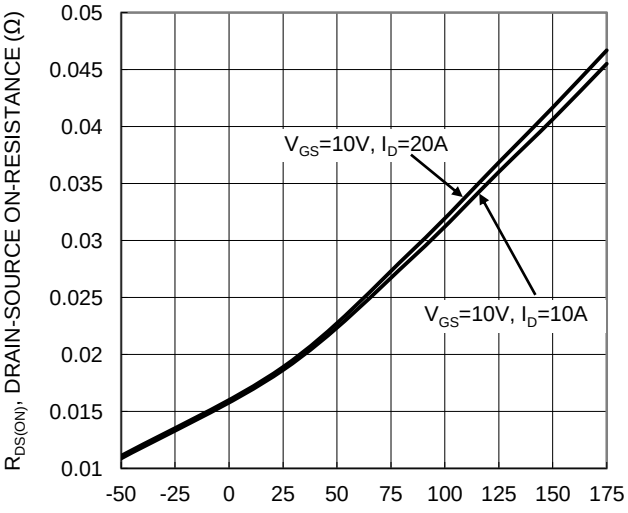

Figure 7. On-Resistance Variation with Temperature

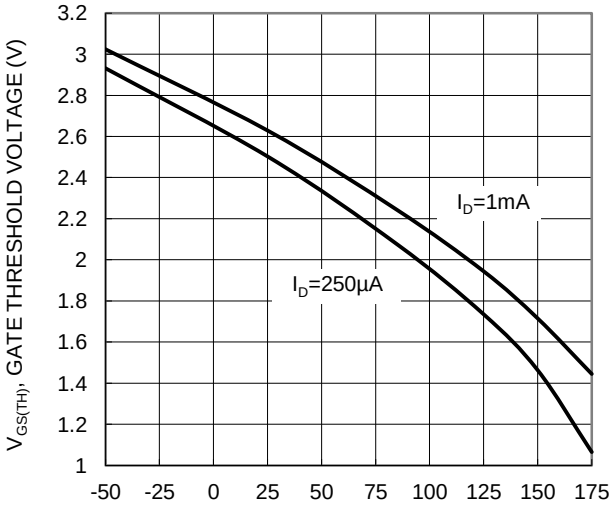

Figure 8. Gate Threshold Variation vs. Junction Temperature

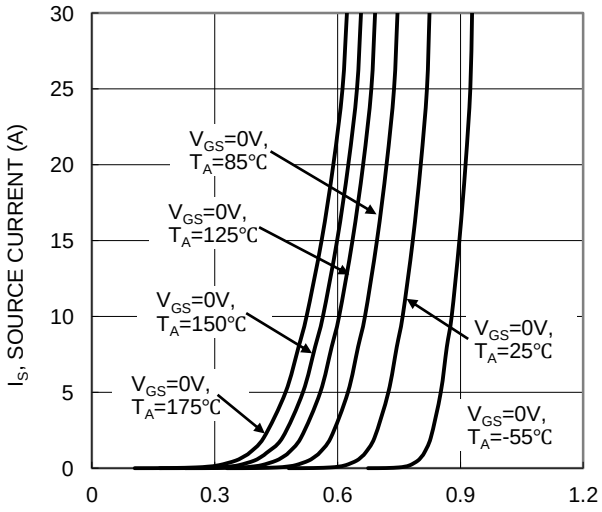

Figure 9. Diode Forward Voltage vs. Current

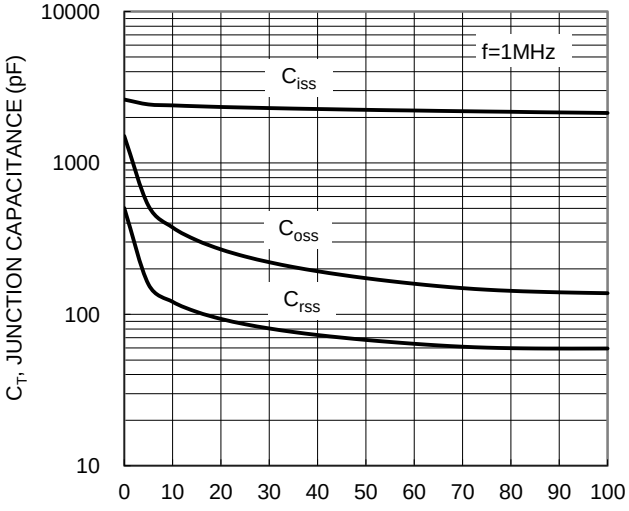

Figure 10. Typical Junction Capacitance

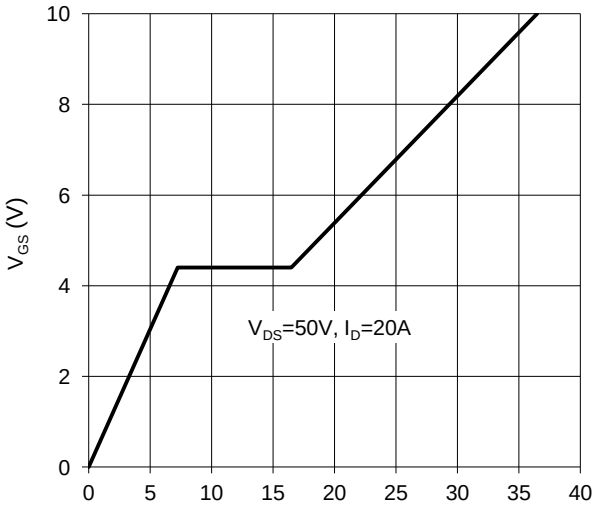

Figure 11. Gate Charge

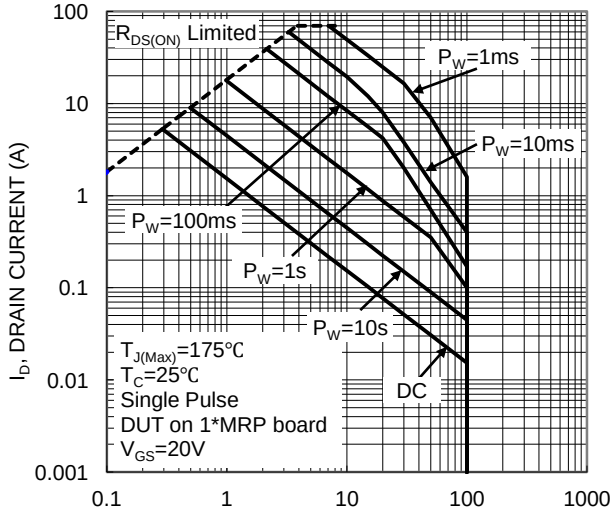

Figure 12. SOA, Safe Operation Area

N-CHANNEL HIGH VOLTAGE MOSFET

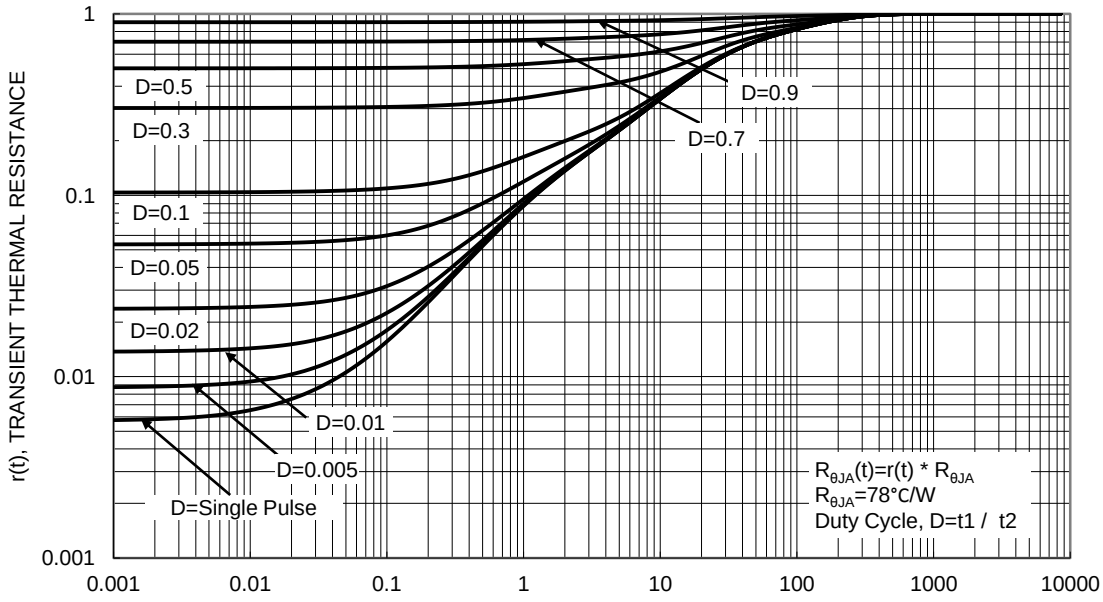

Figure 13. Transient Thermal Resistance

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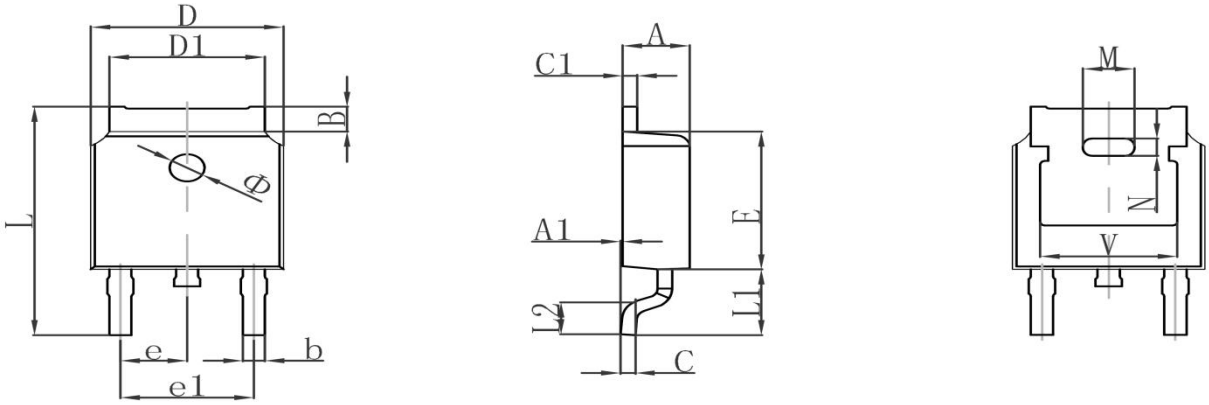
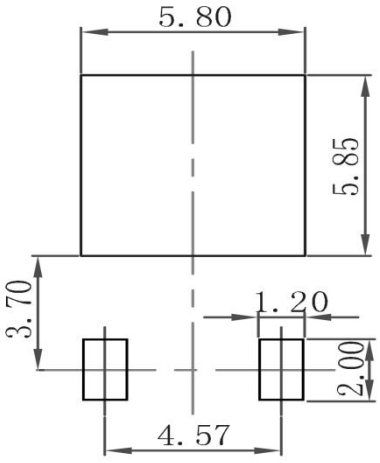
TO-252 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.380	0.087	0.094
A1	0.000	0.100	0.000	0.004
B	0.800	1.400	0.031	0.055
b	0.710	0.810	0.028	0.032
c	0.460	0.560	0.018	0.022
c1	0.460	0.560	0.018	0.022
D	6.500	6.700	0.256	0.264
D1	5.130	5.460	0.202	0.215
E	6.000	6.200	0.236	0.244
e	2.286TYP		0.090TYP	
e1	4.327	4.727	0.170	0.186
M	1.778REF		0.070REF	
N	0.762REF		0.018REF	
L	9.800	10.400	0.386	0.409
L1	2.9REF		0.114REF	
L2	1.400	1.700	0.055	0.067
V	4.830REF		0.190REF	
Φ	1.100	1.300	0.043	0.051

TO-252 Suggested Pad Layout



Note:

1.Controlling dimension: in millimeters

2.General tolerance: ±0.05mm

3.The pad layout is for reference purposes only

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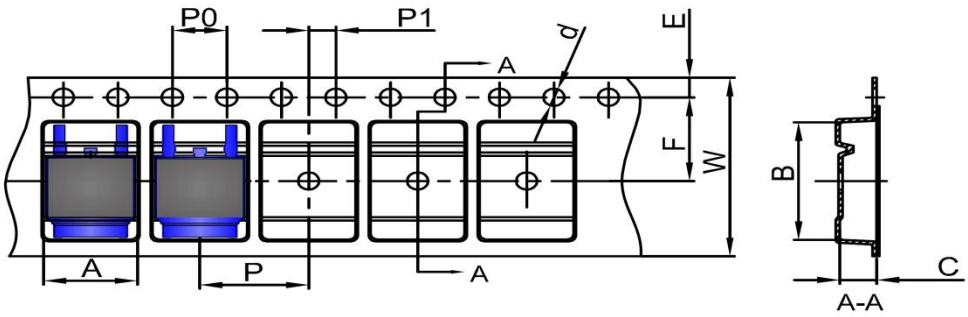
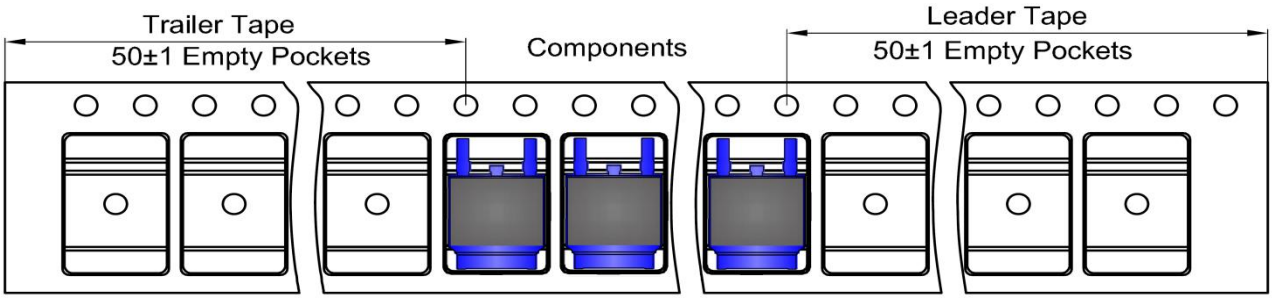
TO-252 Tape and Reel

TO-252 Embossed Carrier Tape

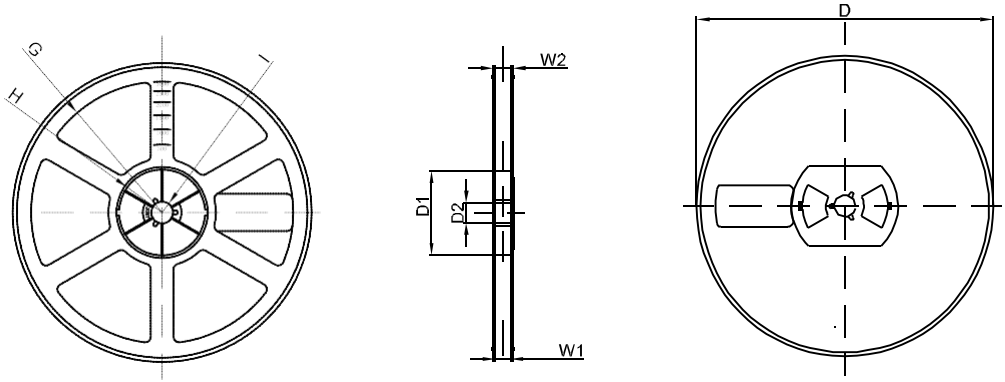


	DIMENSIONS ARE IN MILLIMETER									
TYPE	A	B	C	d	E	F	P0	P	P1	W
TO-252	6.90	10.50	2.70	Ø1.55	1.75	7.50	4.00	8.00	2.00	16.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

TO-252 Tape Leader and Trailer



TO-252 Reel



	DIMENSIONS ARE IN MILLIMETER							
REEL OPTION	D	D1	D2	G	H	I	W1	W2
13” DIA	Ø330.00	100.00	Φ21.00	R151.00	R56.00	R6.50	16.40	21.00
TOLERANCE	±2	±1	±1	±1	±1	±1	±1	±1