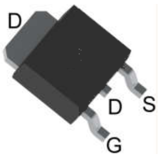
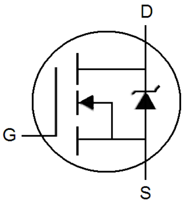
N-CHANNEL Power MOSFET

FEATURES

- V_{DS}:650VMax., I_D: 4A Max.
- $R_{DS(ON)}$:2.6Ω(max.)@ V_{GS}=10V,I_D=1A
- High density cell design for ultra low on-resistance
- Fully characterized avalanche voltage and current



TO-252



EQUIVALENT CIRCUIT

MECHANICAL DATA

- Case: TO-252
- Case material: Molded Plastic. UL flammability 94V-0
- Weight:0.33grams(approximate)
- Marking:D4N65

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

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	650	V
Gate-source voltage	V_{GS}	±30	V
Continuous drain current, V_{GS}=10V	I_D	4	A
Pulsed drain current (Note 1)	I_{DM}	16	A
Power dissipation	P_D	23.1	W
Thermal resistance from junction to ambient	$R_{\theta JA}$	100	°C/W
Operating junction and storage temperature	T_J,T_{STG}	-55~+150	°C
Single Pulsed Avalanche Energy (note 1)	E_{AS}	250	mJ
Lead Temperature for Soldering Purposes (1/8'' from case for 10s)	T_L	260	°C

Note: 1. E_{AS} condition: V_{DD}=20V,L=0.5mH, R_G=25Ω, Starting T_J = 25°C

ELECTRICAL CHARACTERISTICS (T$_A$=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	650	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 650V, V_{GS} = 0V, T_J = 25ºC	--	--	100	nA
I_{GSS}	Gate-Source Leakage	V_{GS} = ±30V	--	--	±100	nA
$V_{GS(th)}$	Gate-Source Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	2.0	--	4.0	V
$R_{DS(on)}$	Drain-Source On-Resistance (Note3)	V_{GS} = 10V, I_D =1A	--	2.22	2.6	Ω
C_{iss}	Input Capacitance	V_{GS} = 0V, V_{DS} = 25V, f = 1.0MHz	--	450	--	pF
C_{oss}	Output Capacitance		--	50	--	
C_{rss}	Reverse Transfer Capacitance		--	6	--	
Q_g	Total Gate Charge	V_{DD} = 325V, I_D = 4A, V_{GS} = 10V	--	8.5	--	nC
Q_{gs}	Gate-Source Charge		--	2.8	--	
Q_{gd}	Gate-Drain Charge		--	2.5	--	
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = 325V, I_D = 4A, R_G = 4.7Ω	--	10	--	ns
t_r	Turn-on Rise Time		--	7	--	
$t_{d(off)}$	Turn-off Delay Time		--	22	--	
t_f	Turn-off Fall Time		--	9	--	
I_S	Continuous Body Diode Current	T_C = 25 ºC	--	--	4	A
I_{SM}	Pulsed Diode Forward Current		--	--	16	
V_{SD}	Body Diode Voltage	T_J = 25ºC, I_{SD} = 1.0A, V_{GS} = 0V	--	--	0.9	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0V,I_S = 4.0A, di_F/dt =100A /μs	--	235	--	ns
Q_{rr}	Reverse Recovery Charge		--	750	--	nC

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TYPICAL CHARACTERISTICS

Figure 1. Maximum Transient Thermal Impedance

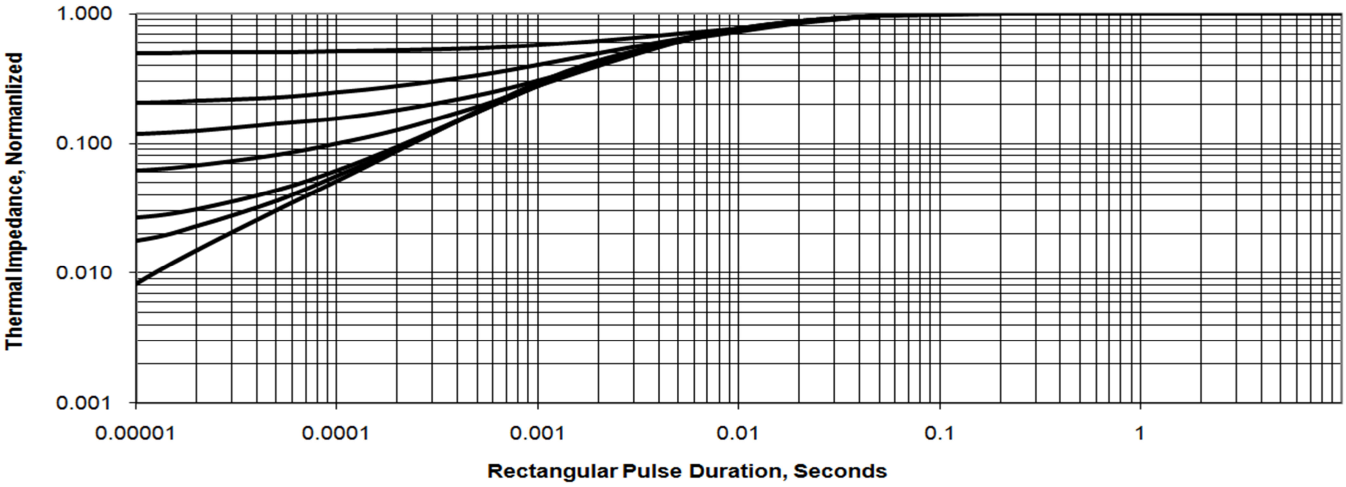


Figure 2 . Maximum Power Dissipation vs Case Temperature

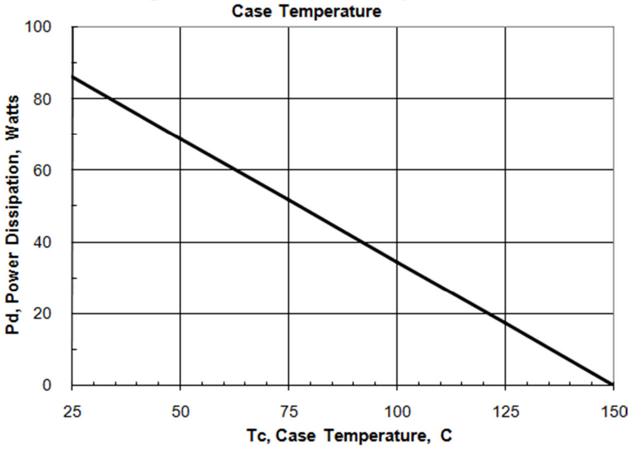


Figure 3 .Maximum Continuous Drain Current vs Case Temperature

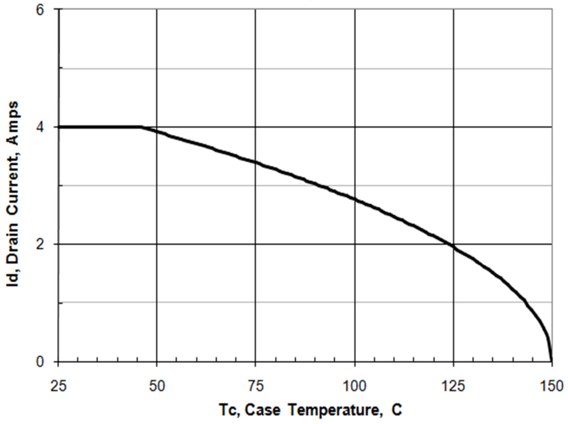


Figure 4. Typical Output Characteristics

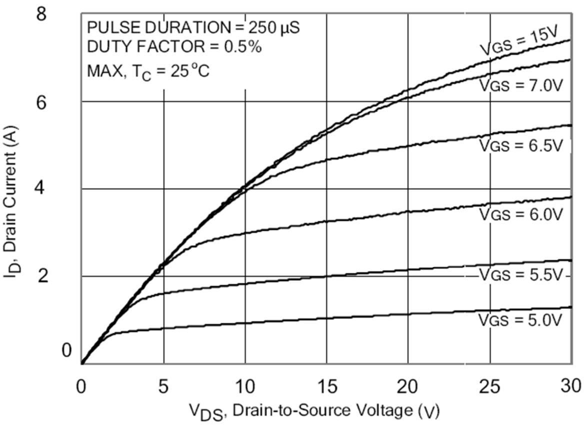
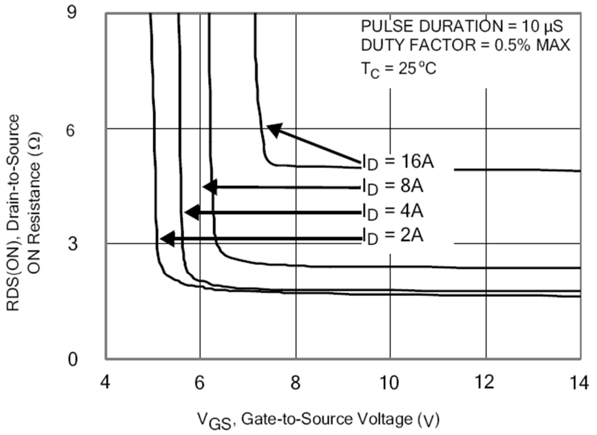
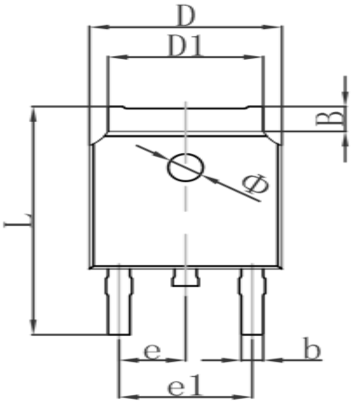
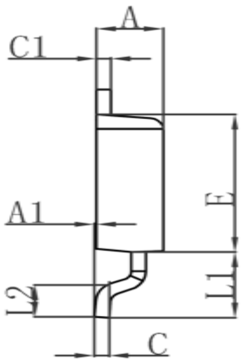


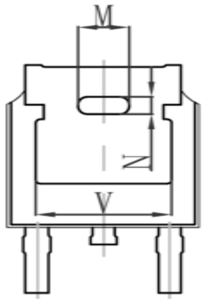
Figure 5. Typical Drain-to-Source ON Resistance vs Gate Voltage and Drain Current



TO-252 PACKAGE OUTLINE DIMENSIONS

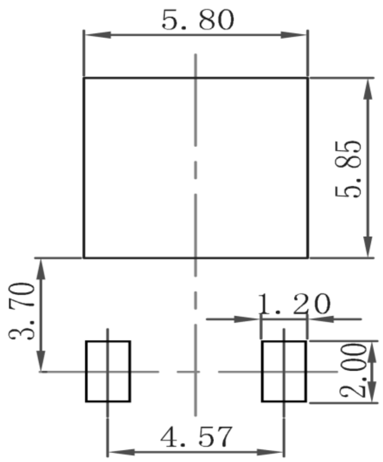






Symbol	DimensionsIn Millimeters		DimensionsIn Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.380	0.087	0.094
A1	0.000	0.100	0.000	0.004
B	0.800	1.400	0.031	0.055
b	0.710	0.810	0.028	0.032
c	0.460	0.560	0.018	0.022
c1	0.460	0.560	0.018	0.022
D	6.500	6.700	0.256	0.264
D1	5.130	5.460	0.202	0.215
E	6.000	6.200	0.236	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

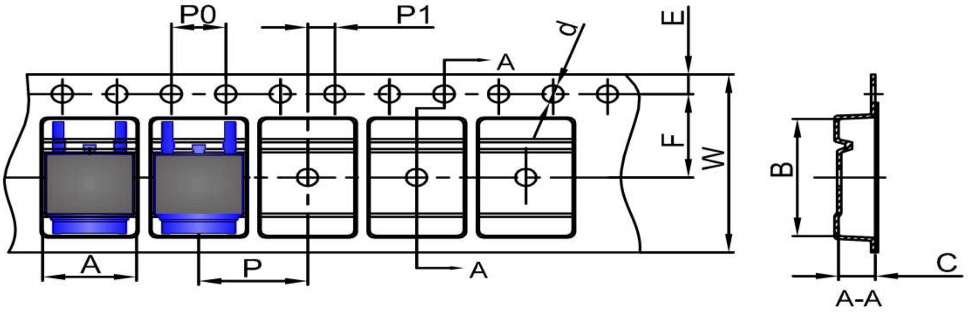


Note:

1. Controlling dimension: in millimeters
2. General tolerance: ±0.05mm
3. The pad layout is for reference purposes only

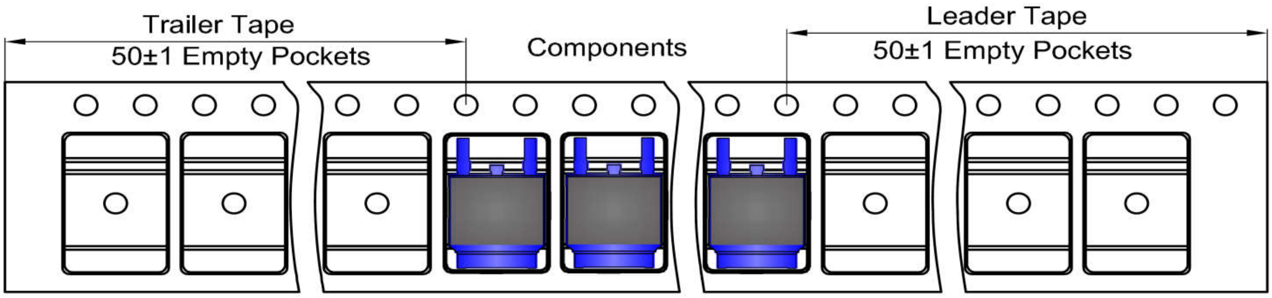
TO-252 TAPE AND REEL

TO-252 Embossed Carrier Tape

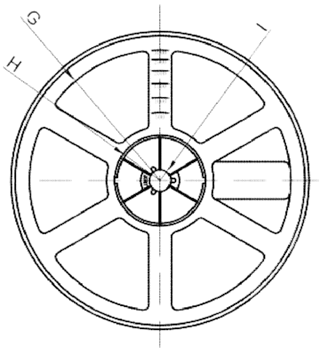


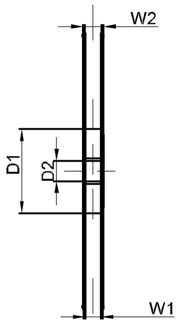
	DIMENSIONS ARE IN MILLIMETER									
TYPE	A	B	C	d	E	F	P0	P	P1	W
TO-252	6.90	10.50	2.70	Ø1.55	1.75	7.50	4.00	8.00	2.00	16.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

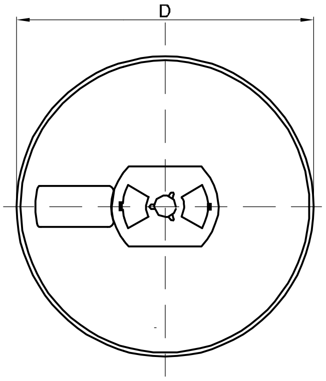
TO-252 Tape Leader and Trailer



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