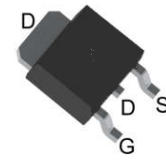
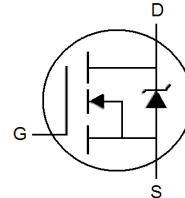


**N-CHANNEL Power MOSFET**
**FEATURES**

- $V_{DS}$ :500VMax.,  $I_D$ : 5A Max.
- $R_{DS(ON)}$ :1.7 $\Omega$  (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:D4N50

**MAXIMUM RATINGS** ( $T_A=25^\circ\text{C}$  unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	$V_{DS}$	500	V
Gate-source voltage	$V_{GS}$	$\pm 30$	V
Continuous drain current, $V_{GS}=10V$	$I_D$	5	A
Pulsed drain current (Note 1)	$I_{DM}$	20	A
Power dissipation	$P_D$	22	W
Thermal resistance from junction to ambient	$R_{\theta JA}$	100	$^\circ\text{C/W}$
Operating junction and storage temperature	$T_J, T_{STG}$	-55~+150	$^\circ\text{C}$
Single Pulsed Avalanche Energy (note 1)	$E_{AS}$	10	mJ
Lead Temperature for Soldering Purposes (1/8" from case for 10s)	$T_L$	260	$^\circ\text{C}$

Note: 1.  $E_{AS}$  condition:  $V_{DD}=20V, L=0.5mH, R_G=25\Omega$ , Starting  $T_J = 25^\circ\text{C}$

**N-CHANNEL Power MOSFET**
**ELECTRICAL CHARACTERISTICS** (TA=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	500	--	--	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 500V, V_{GS} = 0V, T_J = 25^\circ C$	--	--	100	nA
$I_{GSS}$	Gate-Source Leakage	$V_{GS} = \pm 30V$	--	--	$\pm 100$	nA
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	--	4.0	V
$R_{DS(on)}$	Drain-Source On-Resistance (Note3)	$V_{GS} = 10V, I_D = 1A$	--	1.45	1.7	$\Omega$
$C_{iss}$	Input Capacitance	$V_{GS} = 0V,$ $V_{DS} = 25V, f = 1.0MHz$	--	460	--	pF
$C_{oss}$	Output Capacitance		--	55.2	--	
$C_{rss}$	Reverse Transfer Capacitance		--	8.8	--	
$Q_g$	Total Gate Charge	$V_{DD} = 400V, I_D = 5A,$ $V_{GS} = 10V$	--	14.5	--	nC
$Q_{gs}$	Gate-Source Charge		--	2	--	
$Q_{gd}$	Gate-Drain Charge		--	6	--	
$t_{d(on)}$	Turn-on Delay Time	$V_{DD} = 250V, I_D = 5A,$ $R_G = 25 \Omega$	--	10	--	ns
$t_r$	Turn-on Rise Time		--	25	--	
$t_{d(off)}$	Turn-off Delay Time		--	40	--	
$t_f$	Turn-off Fall Time		--	55	--	
$I_S$	Continuous Body Diode Current	$T_C = 25^\circ C$	--	--	5	A
$I_{SM}$	Pulsed Diode Forward Current		--	--	20	
$V_{SD}$	Body Diode Voltage	$T_J = 25^\circ C, I_{SD} = 1.0A, V_{GS} = 0V$	--	--	0.9	V
$t_{rr}$	Reverse Recovery Time	$V_{GS} = 0V, I_S = 5.0A,$ $di_F/dt = 100A/\mu s$	--	220	--	ns
$Q_{rr}$	Reverse Recovery Charge		--	3	--	$\mu C$

N-CHANNEL Power MOSFET

TYPICAL CHARACTERISTICS

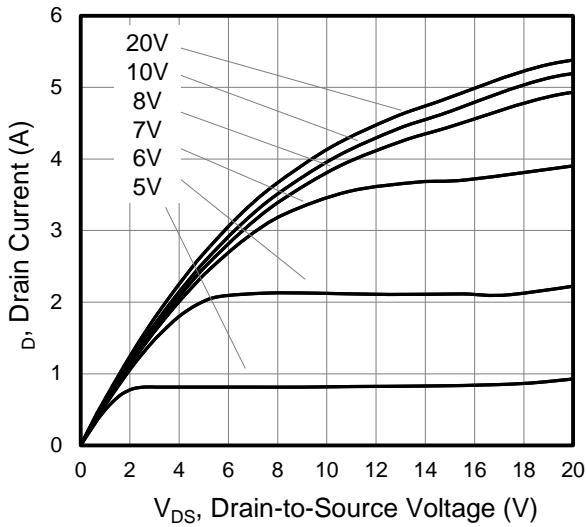


Figure 1. Output Characteristics ( $T_J = 25^\circ\text{C}$ )

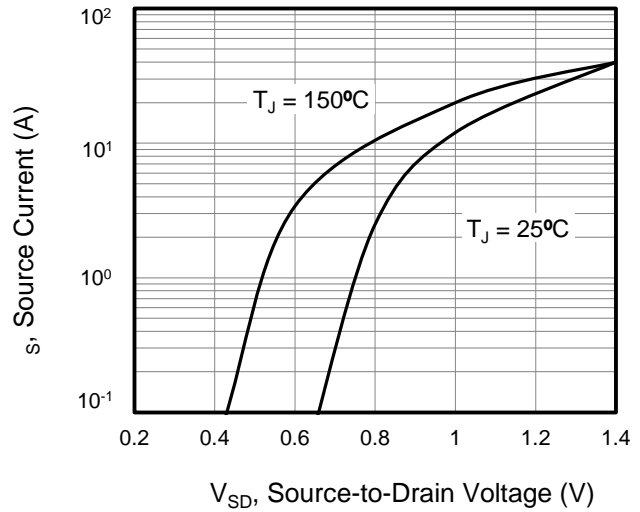


Figure 2. Body Diode Forward Voltage

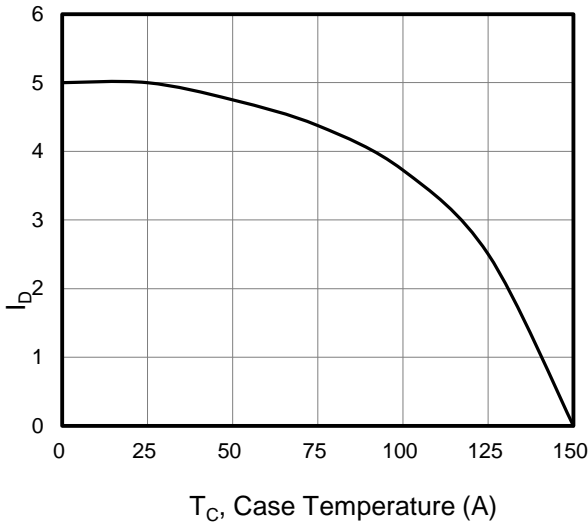


Figure 3. Drain Current vs. Temperature

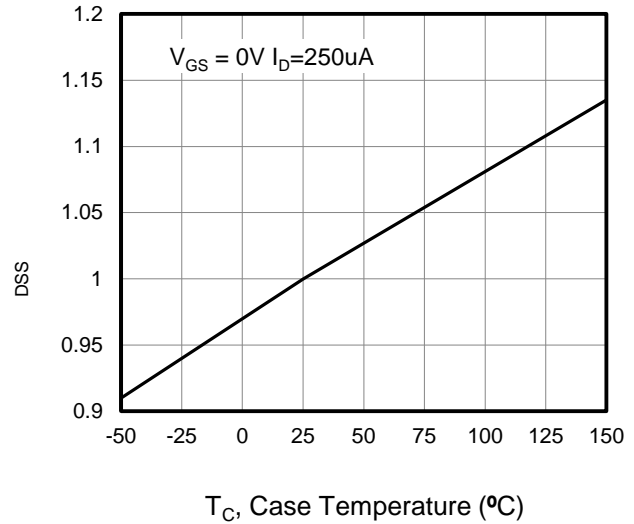


Figure 4.  $BV_{DSS}$  Variation vs. Temperature

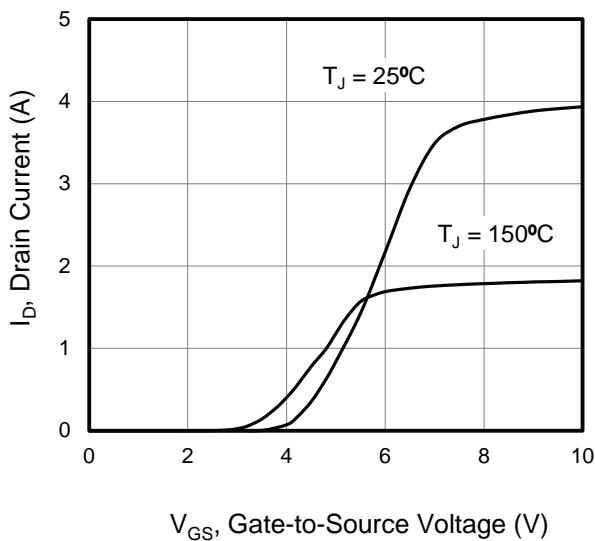


Figure 5. Transfer Characteristics

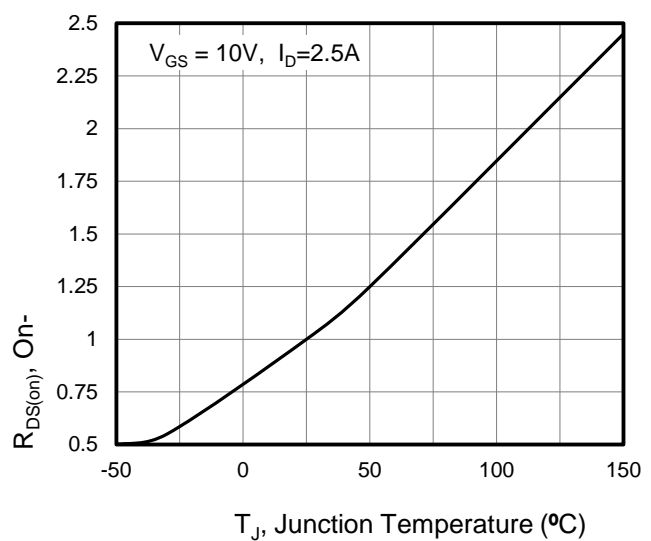
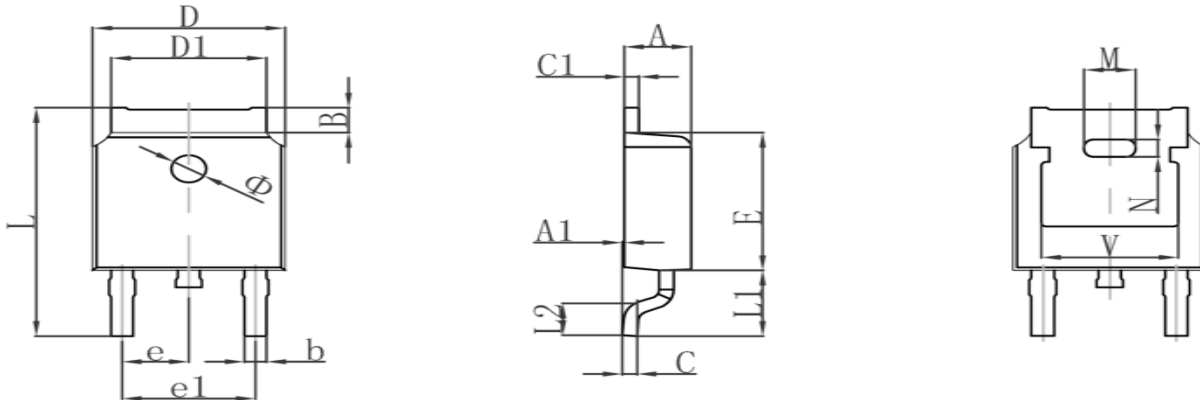


Figure 6. On-Resistance vs. Temperature

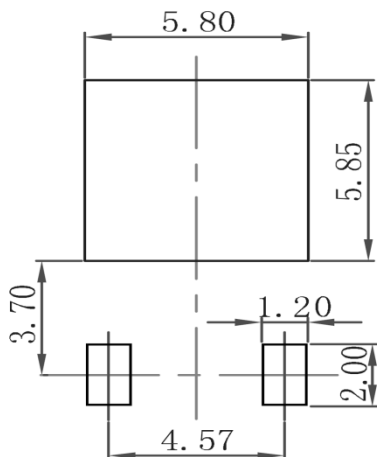
N-CHANNEL Power MOSFET

**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**



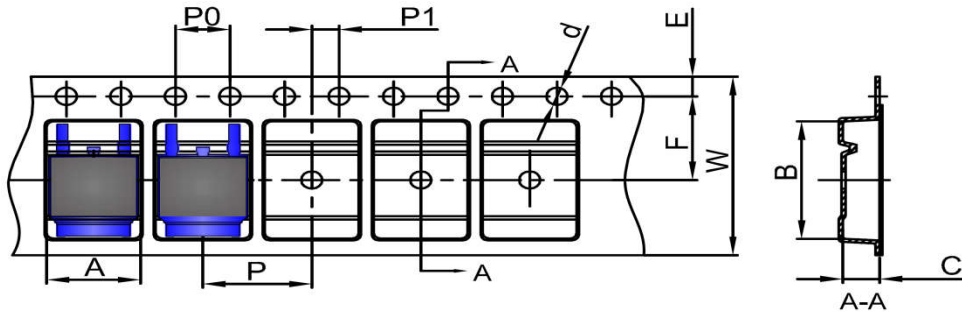
**Note:**

1. Controlling dimension: in millimeters
2. General tolerance:  $\pm 0.05\text{mm}$
3. The pad layout is for reference purposes only

N-CHANNEL Power MOSFET

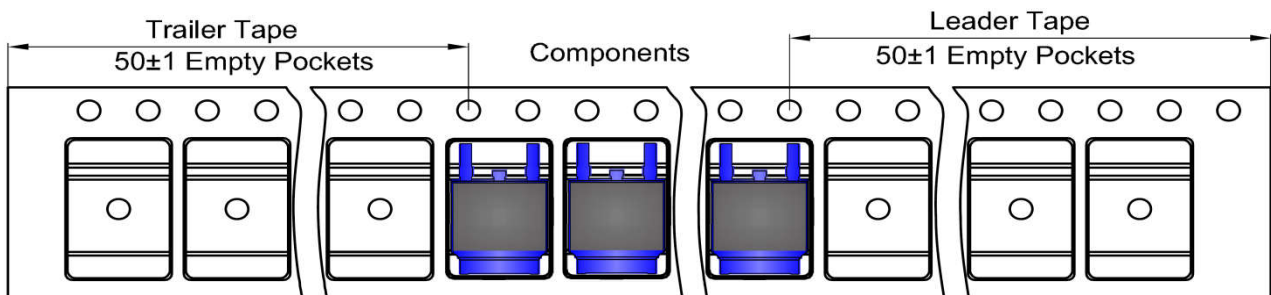
**TO-252 TAPE AND REEL**

**TO-252 Embossed Carrier Tape**

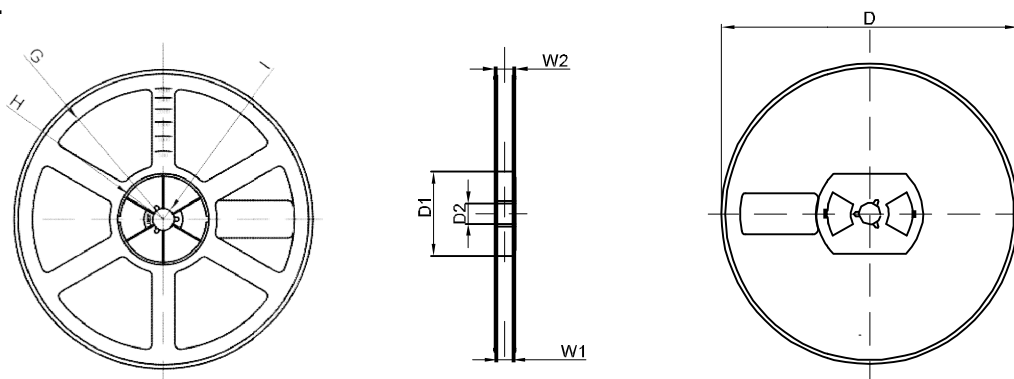


DIMENSIONS ARE IN MILLIMETER										
TYPE	A	B	C	d	E	F	P0	P	P1	W
TO-252	6.90	10.50	2.70	Ø1.55	1.75	7.50	4.00	8.00	2.00	16.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

**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