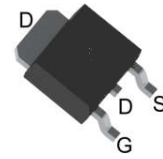
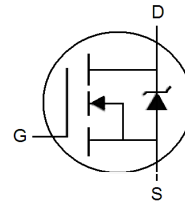


**MOSFET (N-CHANNEL)**
**FEATURES**

- Low on-resistance
- Fast switching speed
- Easily designed drive circuits
- Easy to parallel


**TO-252**

**EQUIVALENT CIRCUIT**
**MECHANICAL DATA**

- Case: PDFN5x6
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.016 grams (approximate)
- **Marking: D90N03**

**MAXIMUM RATINGS (T<sub>A</sub> = 25°C unless otherwise noted)**

Parameter	Symbol	Value	Unit
Drain-source voltage	V <sub>DS</sub>	30	V
Gate-source voltage	V <sub>GS</sub>	±20V	V
Continuous drain current	I <sub>D</sub>	90	A
Power dissipation	P <sub>D</sub>	90	W
Thermal resistance from Junction to ambient	R <sub>θJA</sub>	18	°C/W
Junction and Storage temperature	T <sub>J</sub> , T <sub>STG</sub>	-55 ~+150	°C

**ELECTRICAL CHARACTERISTICS (T<sub>A</sub> = 25°C unless otherwise specified)**

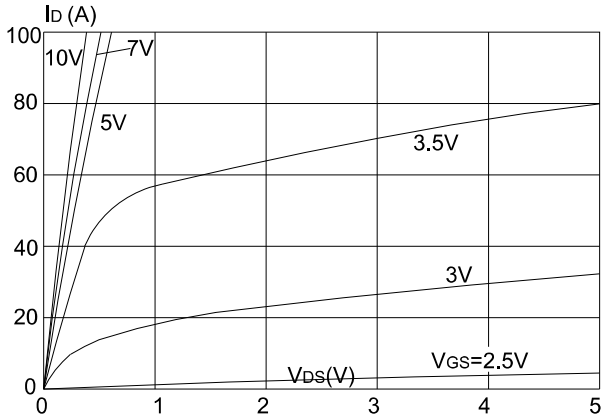
Parameter	Symbol	Min	Typ	Max	Unit	Conditions
<b>Off Characteristics</b>						
Drain-Source breakdown voltage	V <sub>(BR)DSS</sub>	30			V	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA
Zero gate voltage drain current	I <sub>DSS</sub>			1	μA	V <sub>DS</sub> =30V, V <sub>GS</sub> =0V
Gate-body leakage current	I <sub>GSS</sub>			±100	nA	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V
Gate-threshold voltage (note 1)	V <sub>GS(th)</sub>	1	1.6	2.5		V <sub>DS</sub> =20V, I <sub>D</sub> =250μA
Drain-source on-resistance (note 1)	R <sub>DS(ON)</sub>		3.8	5	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> =20A
			5.5	7	mΩ	V <sub>GS</sub> =4.5V, I <sub>D</sub> =10A
<b>Dynamic Characteristics</b>						
Input capacitance	C <sub>iss</sub>		2000		pF	V <sub>DS</sub> =15V, V <sub>GS</sub> =0V, f=1MHz
Output capacitance	C <sub>oss</sub>		320		pF	
Reverse transfer capacitance	C <sub>rss</sub>		240		pF	
<b>Switching Characteristics</b>						
Turn-on delay time	t <sub>d(on)</sub>		13		nS	V <sub>DD</sub> =15V, V <sub>GS</sub> =10V, I <sub>D</sub> =30A R <sub>g</sub> =3Ω
Turn-on rise time	t <sub>r</sub>		36		nS	
Turn-off delay time	t <sub>d(off)</sub>		42		nS	
Turn-off fall time	t <sub>f</sub>		16		nS	

Note:1. Pulse test ; Pulse width ≤300μs, Duty cycle ≤ 2% .

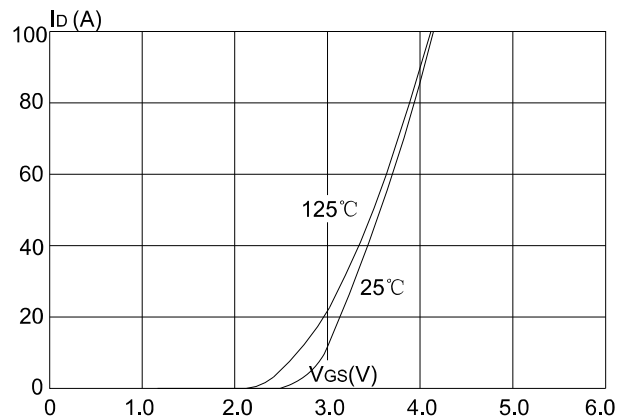
MOSFET (N-CHANNEL)

Typical Characteristics

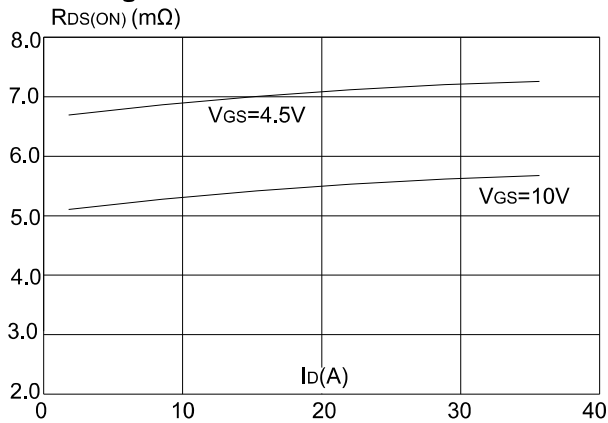
**Figure 1: Output Characteristics**



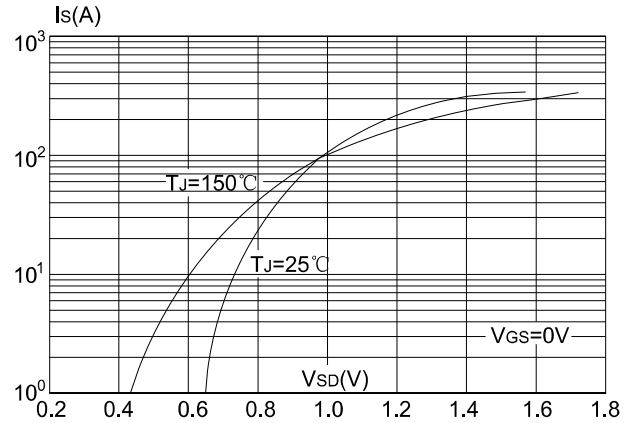
**Figure 2: Typical Transfer Characteristics**



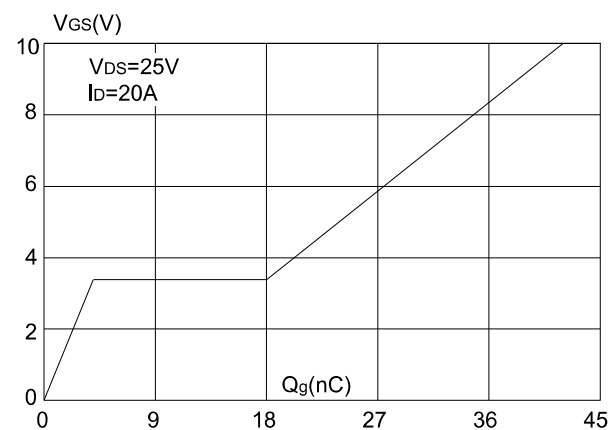
**Figure 3: On-resistance vs. Drain Current**



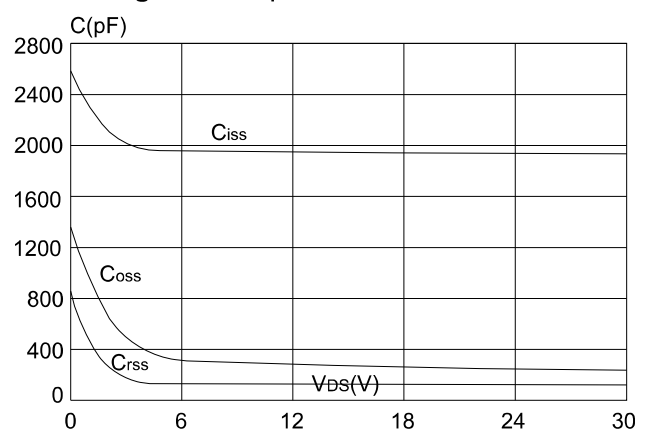
**Figure 4: Body Diode Characteristics**



**Figure 5: Gate Charge Characteristics**



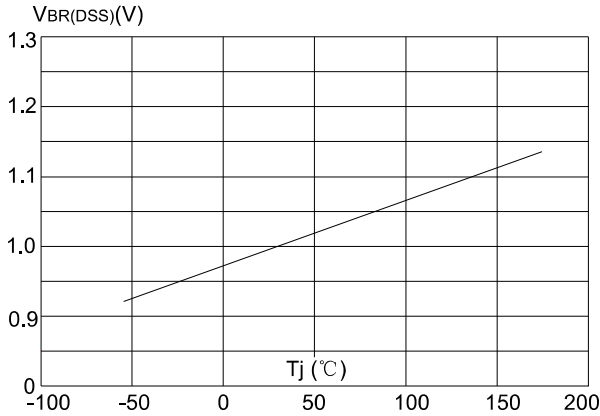
**Figure 6: Capacitance Characteristics**



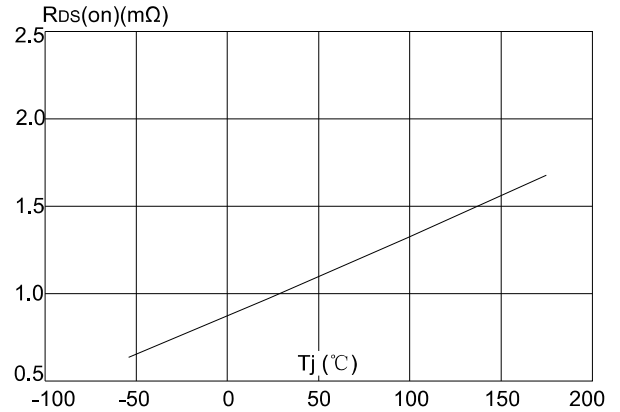
**MOSFET (N-CHANNEL)**

**Typical Characteristics**

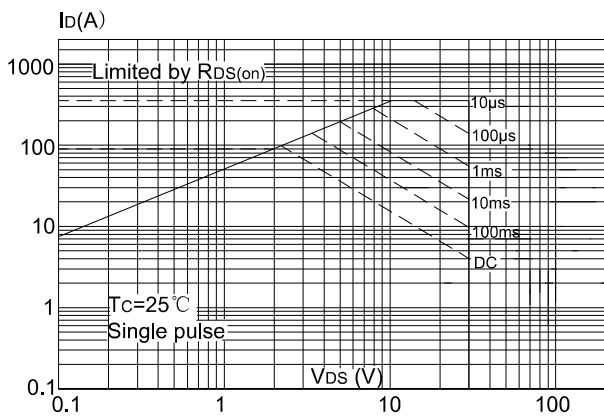
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



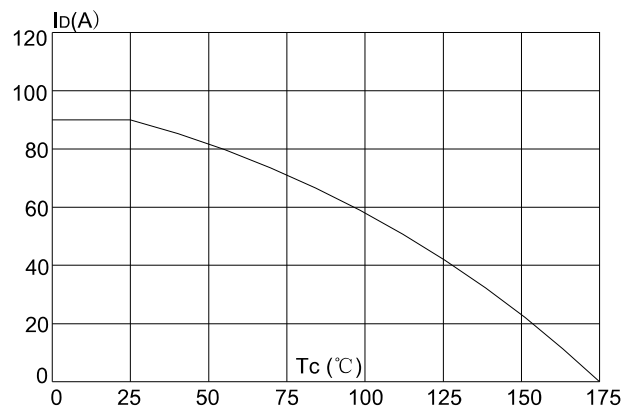
**Figure 8:** Normalized on Resistance vs. Junction Temperature



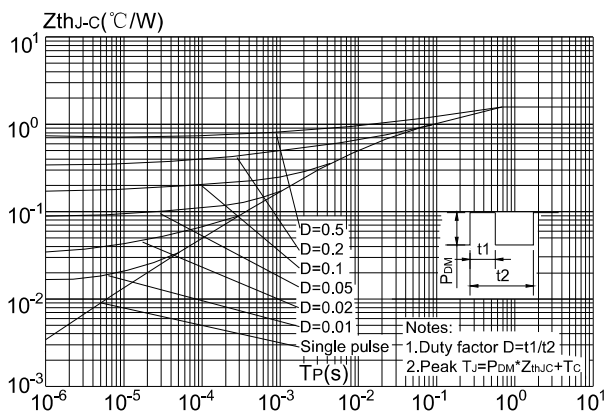
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature

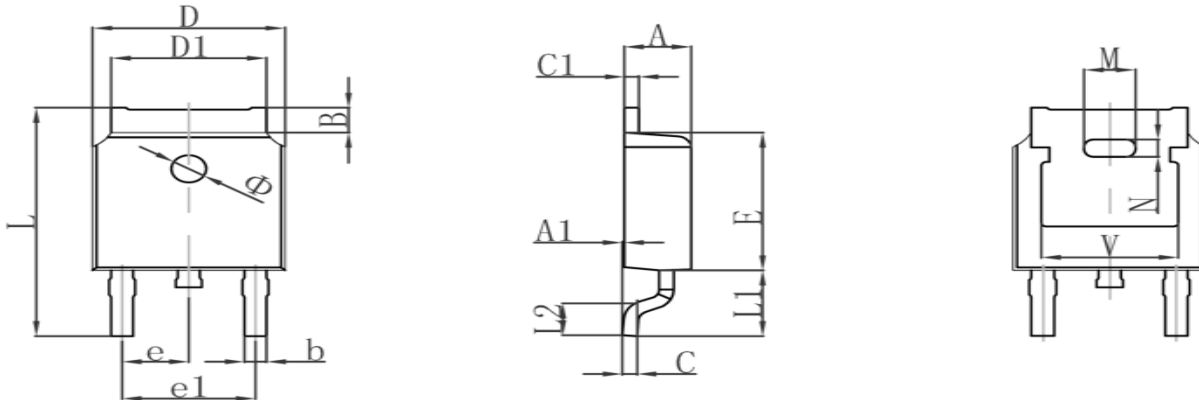


**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case (TO-252)



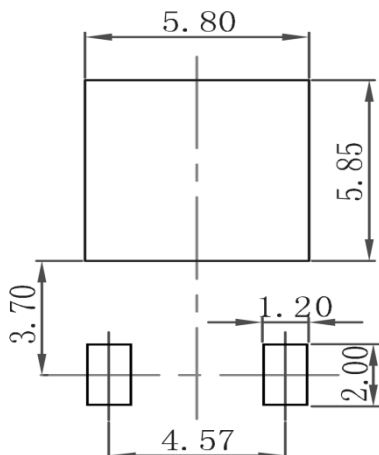
MOSFET (N-CHANNEL)

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



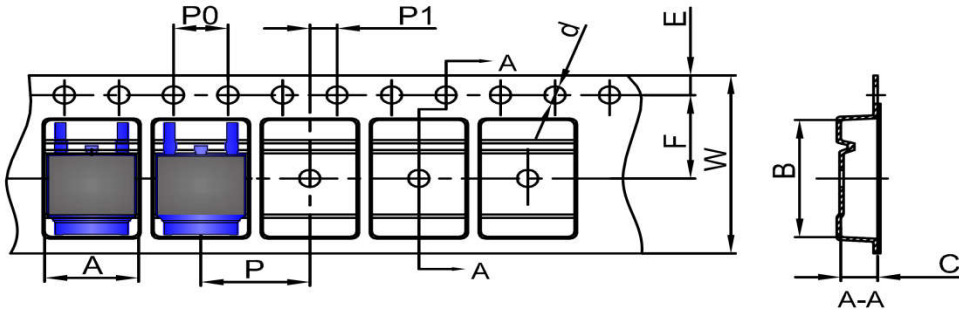
**Note:**

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

MOSFET (N-CHANNEL)

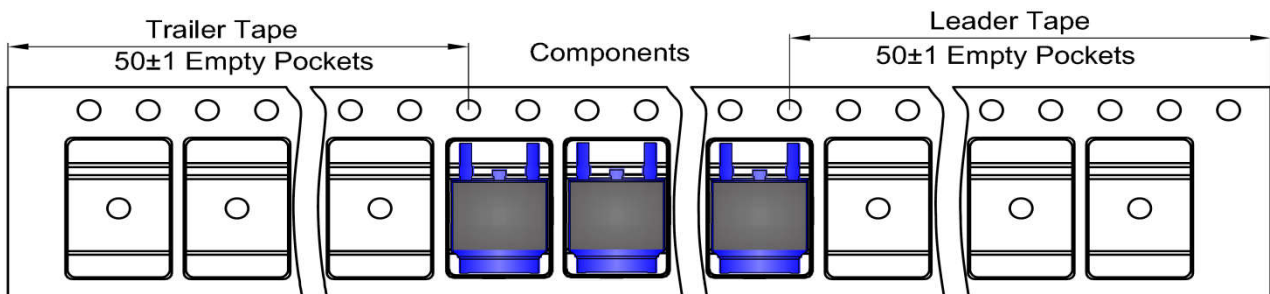
TO-252 TAPE AND REEL

TO-252 Embossed Carrier Tape

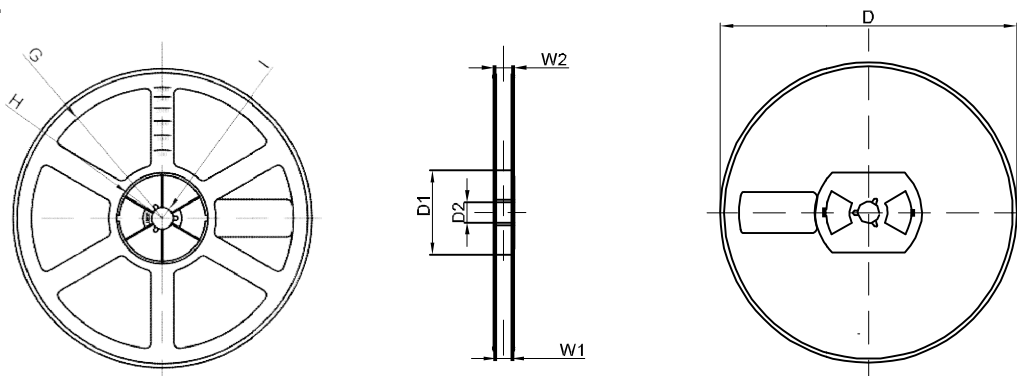


DIMENSIONS ARE IN MILLIMETER										
TYPE	A	B	C	d	E	F	P0	P	P1	W
TO-252	6.90	10.50	2.70	Ø1.55	1.75	7.50	4.00	8.00	2.00	16.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

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

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