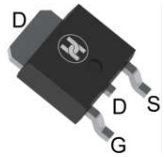
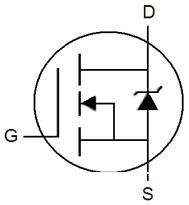
MOSFET (N-CHANNEL)

FEATURES

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



TO-252



EQUIVALENT CIRCUIT

MECHANICAL DATA

- Case: TO-252
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Weight: 0.016 grams (approximate)
- **Marking:D90N03**

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

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	30	V
Gate-source voltage	V_{GS}	±20V	V
Continuous drain current	I_D	90	A
Power dissipation	P_D	90	W
Thermal resistance from Junction to ambient	$R_{\theta JA}$	18	°C/W
Junction and Storage temperature	T_J,T_{STG}	-55 ~+150	°C

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

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Off Characteristics						
Drain-Source breakdown voltage	$V_{(BR)DSS}$	30			V	V_{GS}=0V, I_D=250uA
Zero gate voltage drain current	I_{DSS}			1	μA	V_{DS}=30V, V_{GS}=0V
Gate-body leakage current	I_{GSS}			±100	nA	V_{DS}=0V, V_{GS}=±20V
Gate-threshold voltage (note 1)	$V_{GS(th)}$	1	1.6	2.5		V_{DS}=20V,I_D=250μA
Drain-source on-resistance (note 1)	$R_{DS(ON)}$		3.8	5	mΩ	V_{GS}=10V, I_D=20A
			5.5	7	mΩ	V_{GS}=4.5V, I_D=10A
Dynamic Characteristics						
Input capacitance	C_{iss}		2000		pF	V_{DS}=15V, V_{GS}=0V, f=1MHz
Output capacitance	C_{oss}		320		pF	
Reverse transfer capacitance	C_{rss}		240		pF	
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$		13		nS	V_{DD}=15V. V_{GS}=10V,I_D =30A R_g=3Ω
Turn-on rise time	t_r		36		nS	
Turn-off delay time	$t_{d(off)}$		42		nS	
Turn-off fall time	t_f		16		nS	

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

MOSFET (N-CHANNEL)

Typical Characteristics

Figure1: Output Characteristics

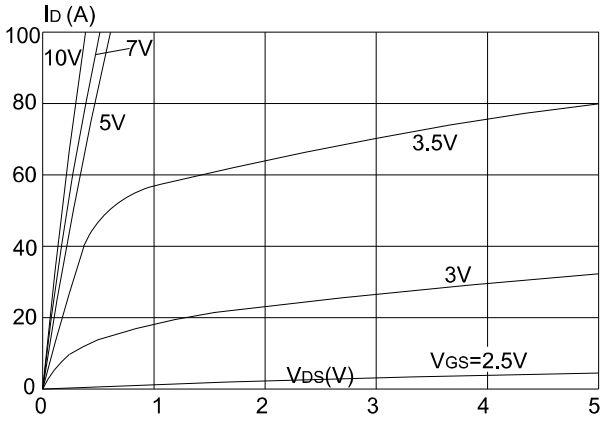


Figure 2: Typical Transfer Characteristics

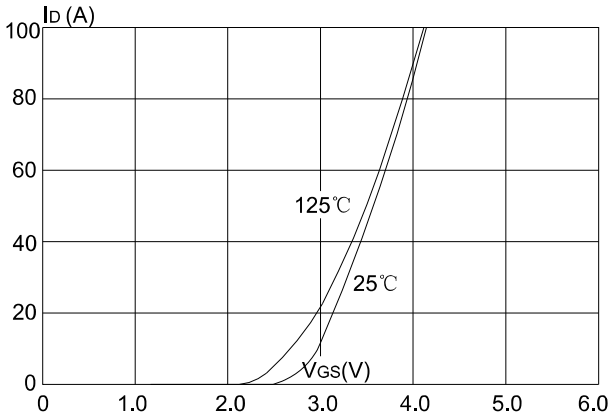


Figure 3: On-resistance vs. Drain Current

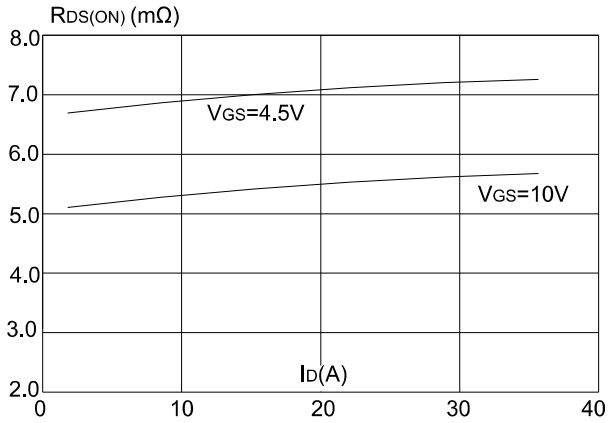


Figure 4: Body Diode Characteristics

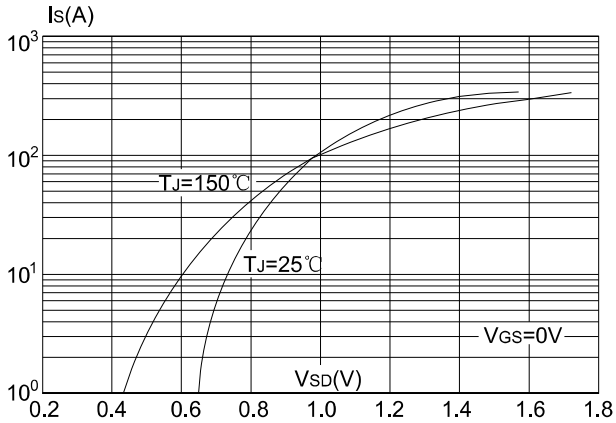


Figure 5: Gate Charge Characteristics

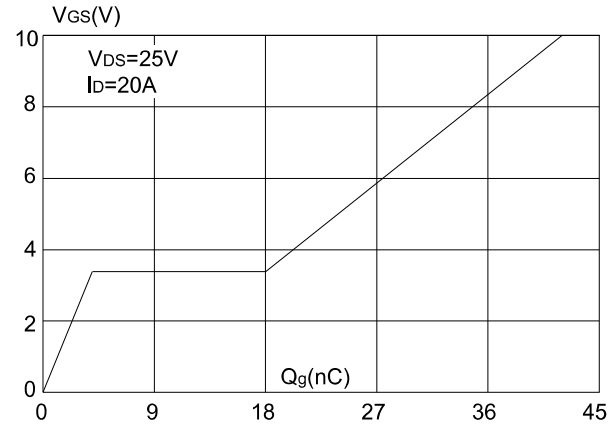
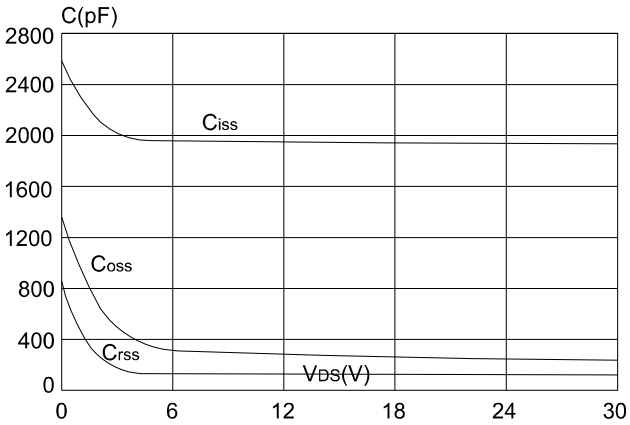


Figure 6: Capacitance Characteristics



MOSFET (N-CHANNEL)

Typical Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

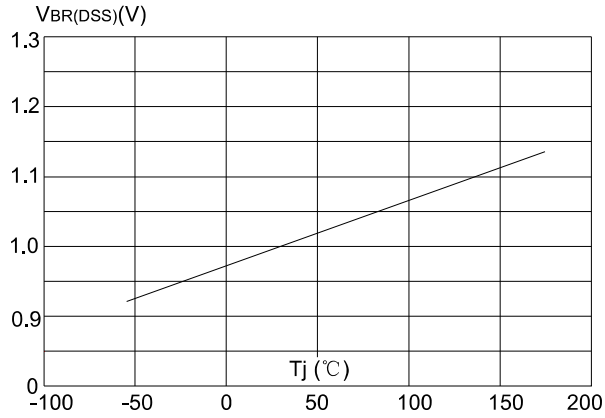


Figure 8: Normalized on Resistance vs. Junction Temperature

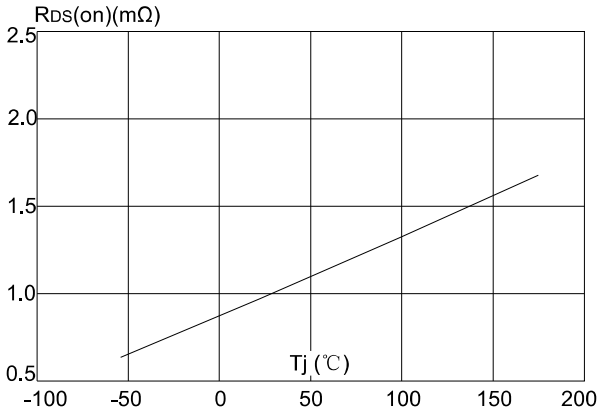


Figure 9: Maximum Safe Operating Area

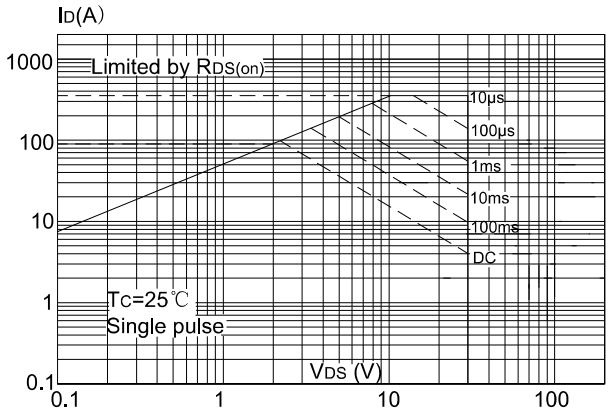


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

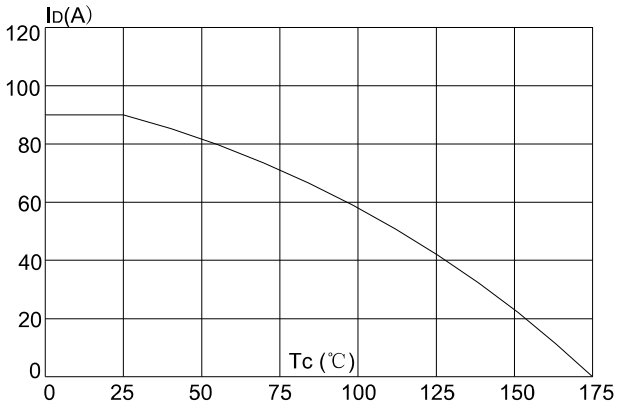
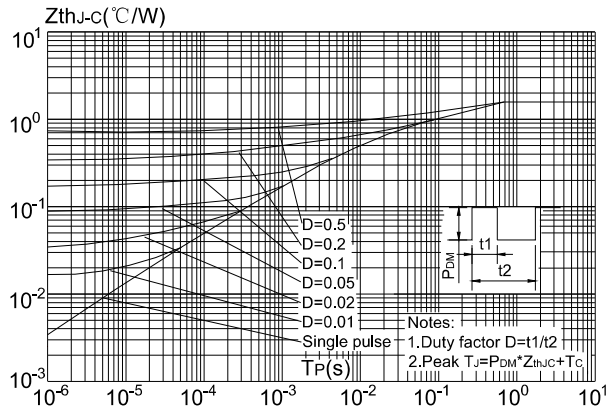
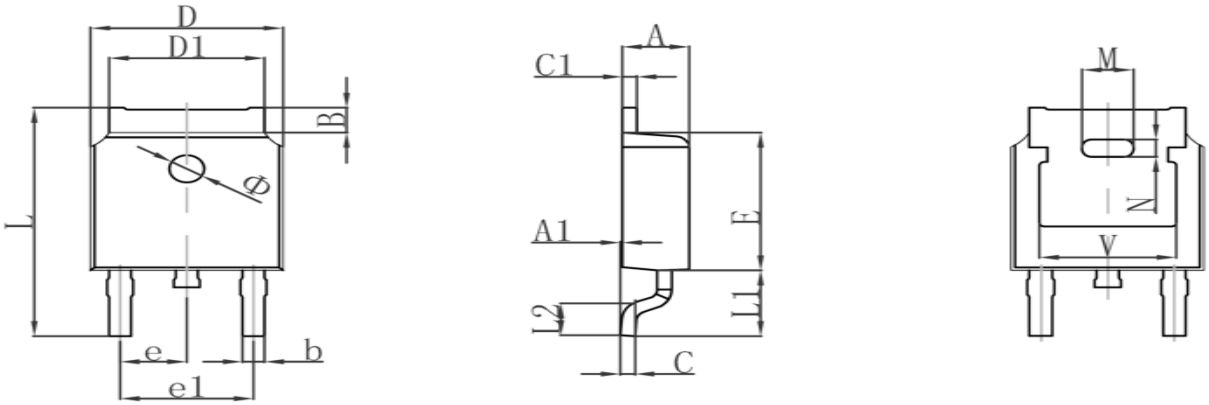


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case (TO-252)



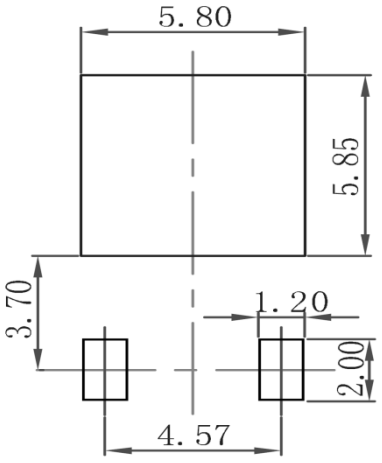
MOSFET (N-CHANNEL)

TO-252 PACKAGE OUTLINE DIMENSIONS



Symbol	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



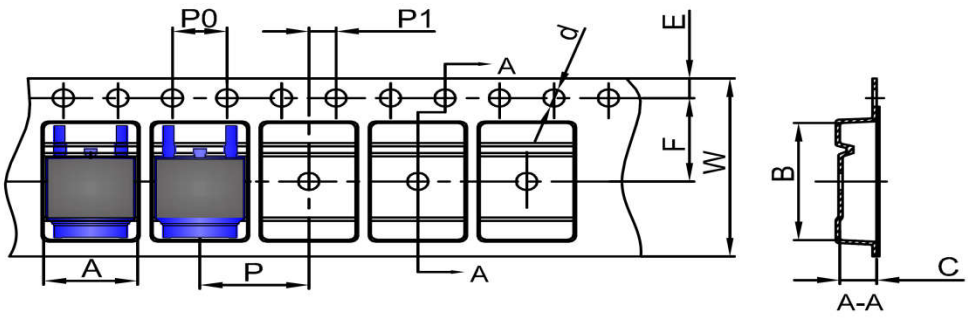
Note:

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

MOSFET (N-CHANNEL)

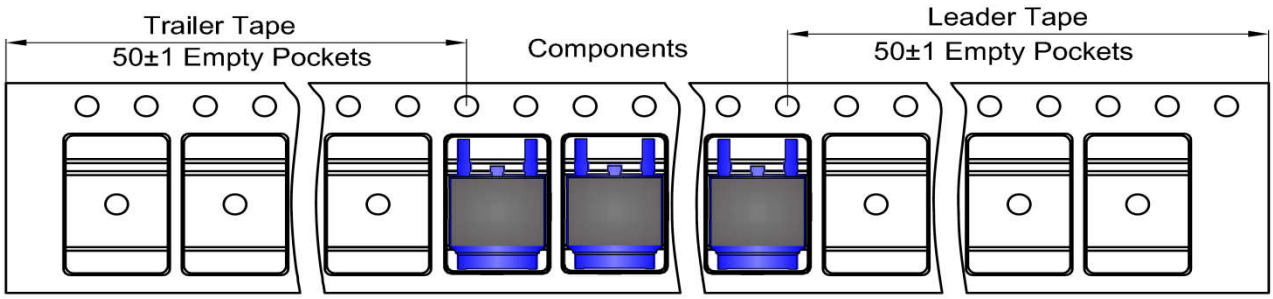
TO-252 TAPE AND REEL

TO-252 Embossed Carrier Tape

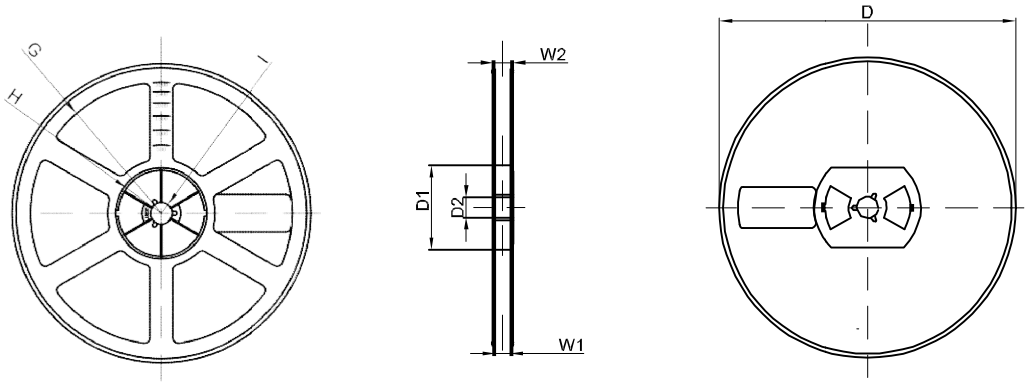


	DIMENSIONS ARE IN MILLIMETER									
TYPE	A	B	C	d	E	F	P0	P	P1	W
TO-252	6.90	10.50	2.70	Ø1.55	1.75	7.50	4.00	8.00	2.00	16.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

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