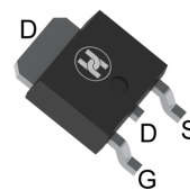
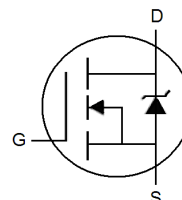


N-CHANNEL Power MOSFET
FEATURES

- V_{DS} : 200V Min, I_D : 5A Max.
- $R_{DS(ON)}$: 0.6 Ω (max.)@ $V_{GS}=10V, I_D=2.5A$
- High density cell design for ultra low on-resistance
- Fully characterized avalanche voltage and current


TO-252
MECHANICAL DATA

- Case: TO-252
- Case material: Molded Plastic. UL flammability 94V-0
- Weight: 0.33grams(approximate)
- Marking: D5N20


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

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	200	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current, $V_{GS}=10V$	I_D	5	A
Pulsed drain current (Note 1)	I_{DM}	20	A
Power dissipation	P_D	78	W
Thermal resistance from junction to Case	$R_{\theta Jc}$	1.6	C/W
Operating junction and storage temperature	T_J, T_{STG}	-55~+150	$^{\circ}\text{C}$
Single Pulsed Avalanche Energy (note 1)	E_{AS}	125	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)

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Off characteristics						
Drain-Source breakdown voltage	V _{(BR)DS}	200			V	V _{GS} =0V, I _D =250μA
Zero gate voltage drain current	I _{DSS}			1	uA	V _{DS} =200V, V _{GS} =0V
Gate-body leakage current	I _{GSS}			±100	nA	V _{DS} =0V, V _{GS} =±20V
On characteristics (note1)						
Gate-threshold voltage	V _{GS(th)}	2.0	-	4.0	V	V _{DS} =V _{GS} , I _D =250μA
Drain-source on-resistance	R _{DS(ON)}		0.57	0.6	Ω	V _{GS} =10V, I _D = 2.5A
Forward transconductance	g _{FS}		5		S	V _{DS} =30V, I _D =2.5A
Dynamic characteristics (Guaranteed by design, not subject to production)						
Input capacitance	C _{iss}		255		pF	V _{GS} =0V V _{DS} =25V f=1.0MHz
Output capacitance	C _{oss}		30.2		pF	
Reverse transfer capacitance	C _{rss}		2.3		pF	
Switching characteristics (Guaranteed by design, not subject to production)						
Turn-on delay time	t _{d(on)}		7.3		ns	V _{DD} =100V I _D =5 A R _G =10Ω V _{GS} =10V
Turn-on rise time	t _r		10.7		ns	
Turn-off delay time	t _{d(off)}		18.2		ns	
Turn-off fall time	t _f		11.9		ns	
Total gate charge	Q _g		10.8		nC	V _{DS} =160V, V _{GS} =10V I _D =5A
Gate-source charge	Q _{gs}		1.7		nC	
Gate-drain charge	Q _{gd}		3.1		nC	
Drain-source diode characteristics						
Diode forward voltage	V _{SD}			2	V	I _S =5A, V _{GS} =0V
Max. forward current	I _S			5	A	
Pulsed drain-source diode forward current	I _{SM}			20	A	

Notes: 1. Pulse Test: Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.

N-CHANNEL Power MOSFET

TYPICAL CHARACTERISTICS

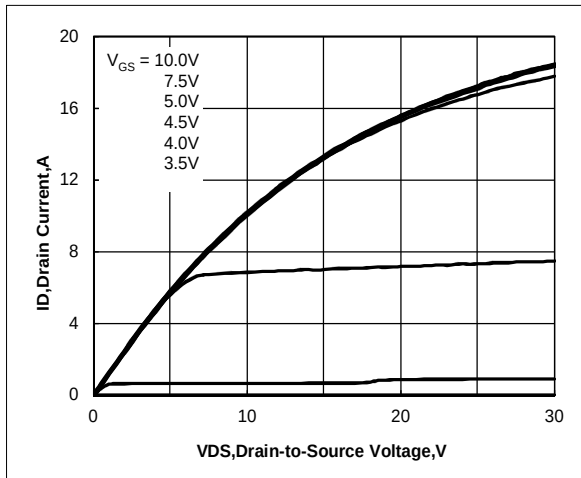


Figure 1. Output Characteristics

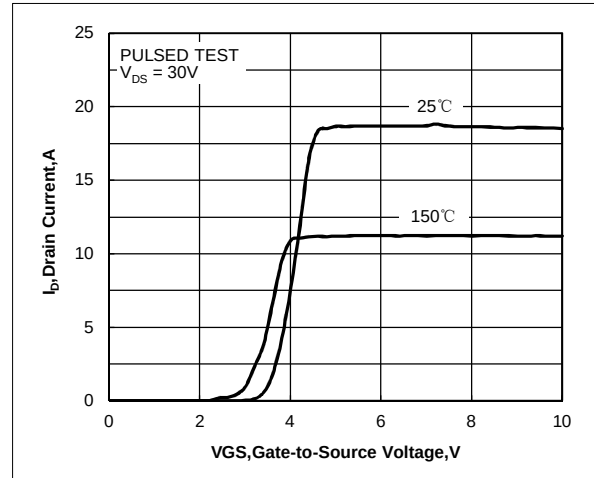


Figure 2. Transfer Characteristics

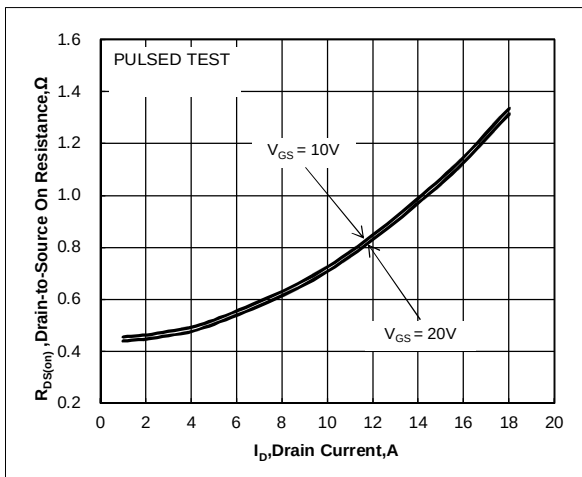


Figure 3. Drain-to-Source On Resistance vs. Drain Current and Gate Voltage

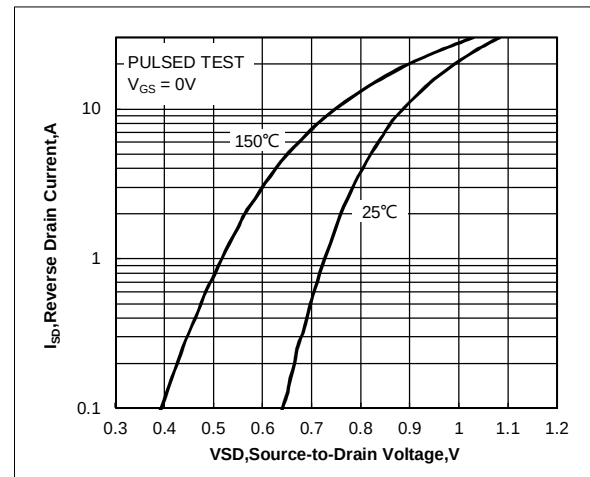
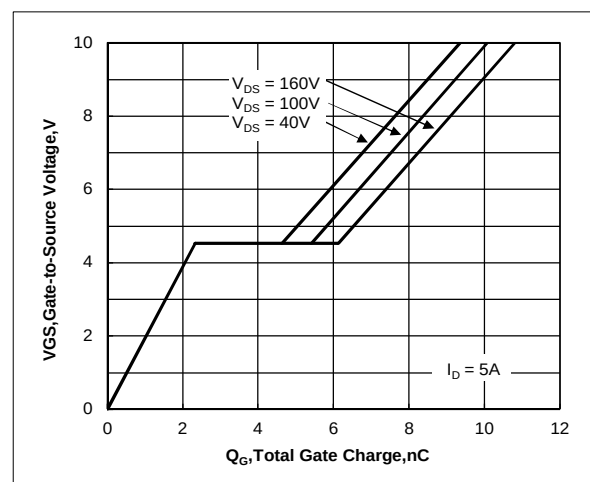
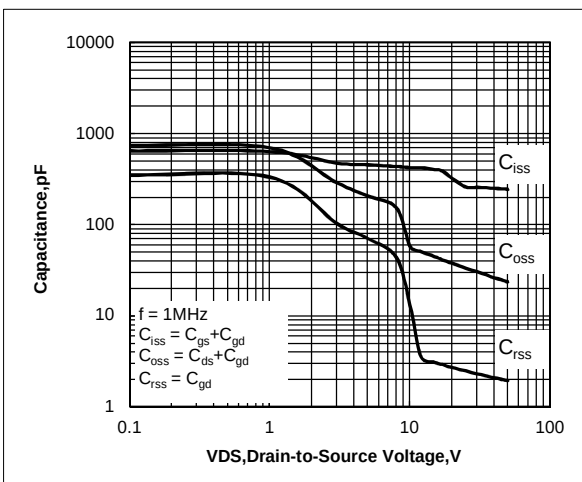


Figure 4. Body Diode Forward Voltage vs. Source Current and Temperature



N-CHANNEL Power MOSFET TYPICAL CHARACTERISTICS

Figure 5. Capacitance Characteristics

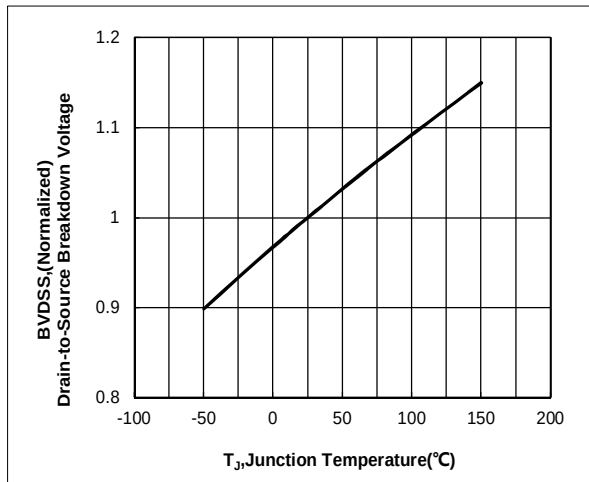


Figure 6. Gate Charge Characteristics

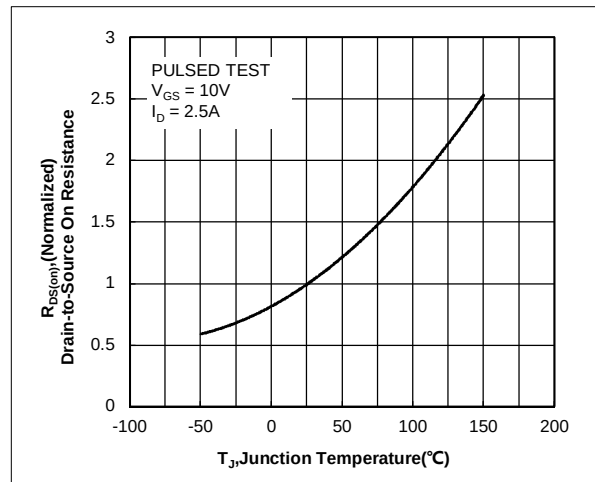


Figure 7. Normalized Breakdown Voltage vs. Junction Temperature

Figure 8. Normalized On Resistance vs. Junction Temperature

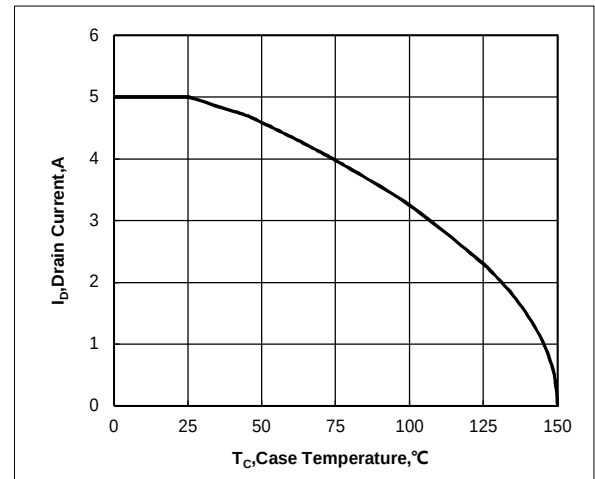
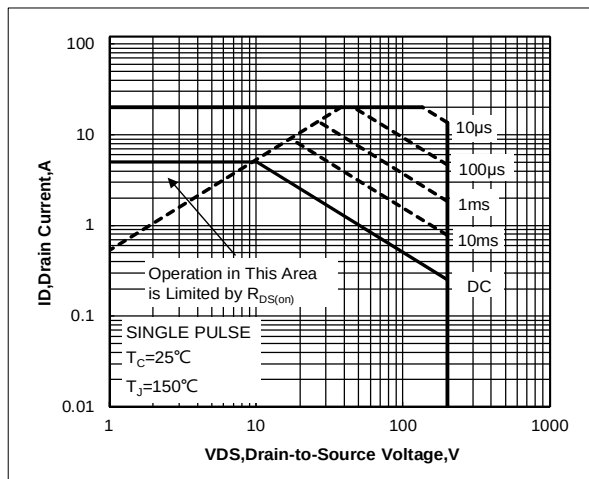
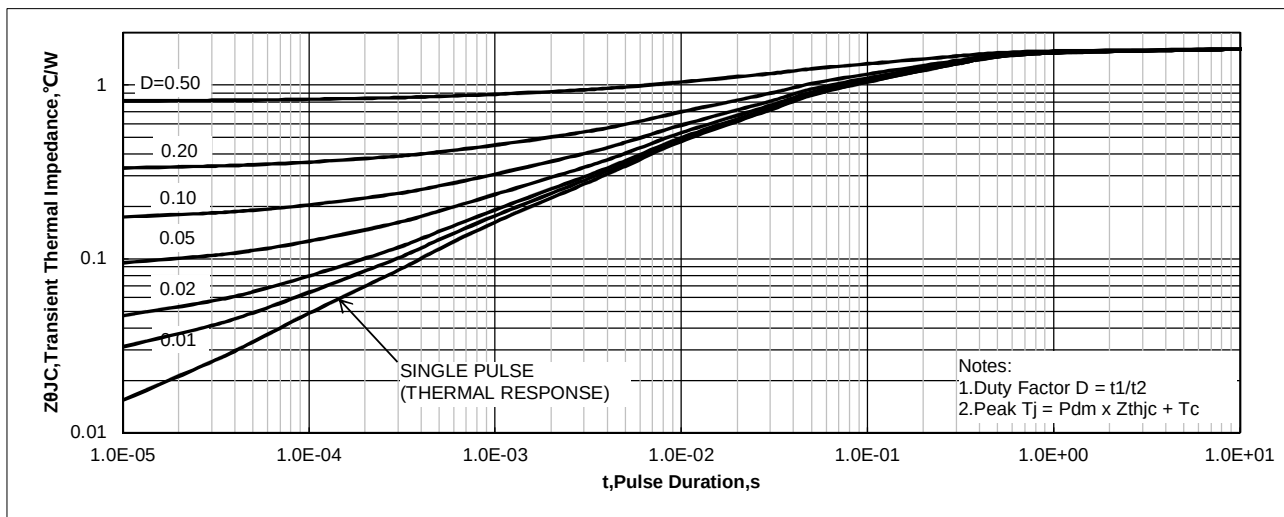
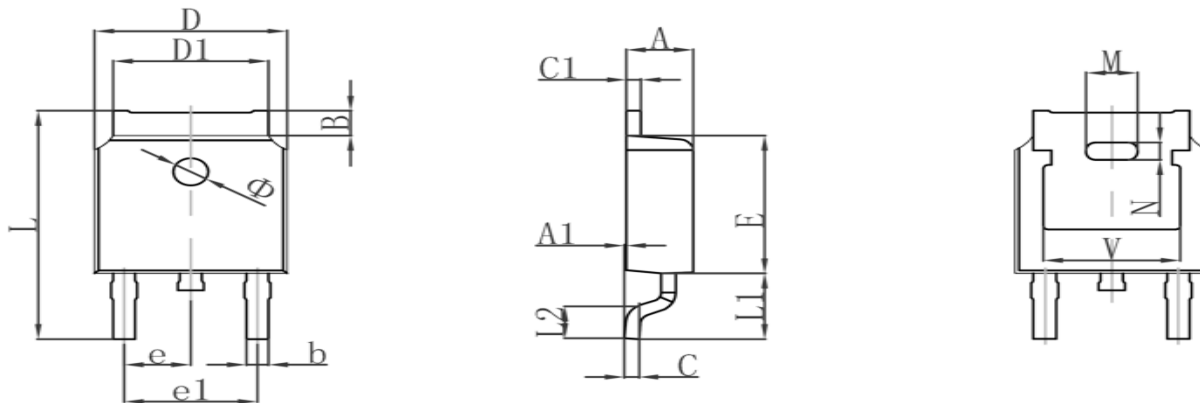


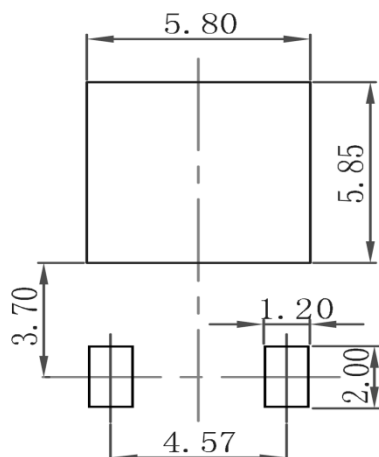
Figure 9. Maximum Safe Operating Area for RU5N20A

Figure 10. Maximum Continuous Drain Current vs. Case Temperature



N-CHANNEL Power MOSFET
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

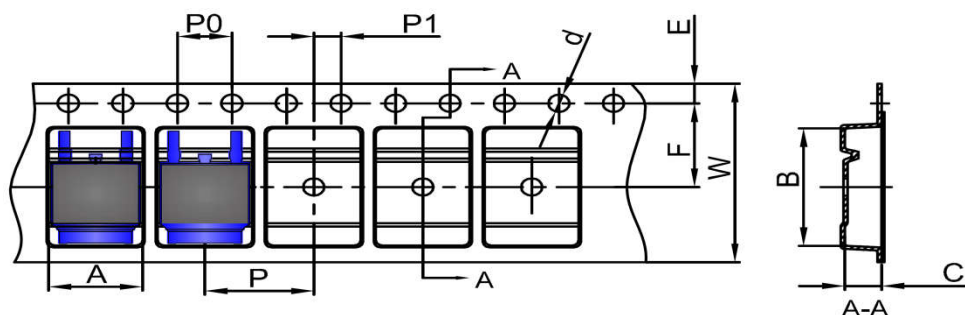
TO-252 SUGGESTED PAD LAYOUT

Note:

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

N-CHANNEL Power MOSFET

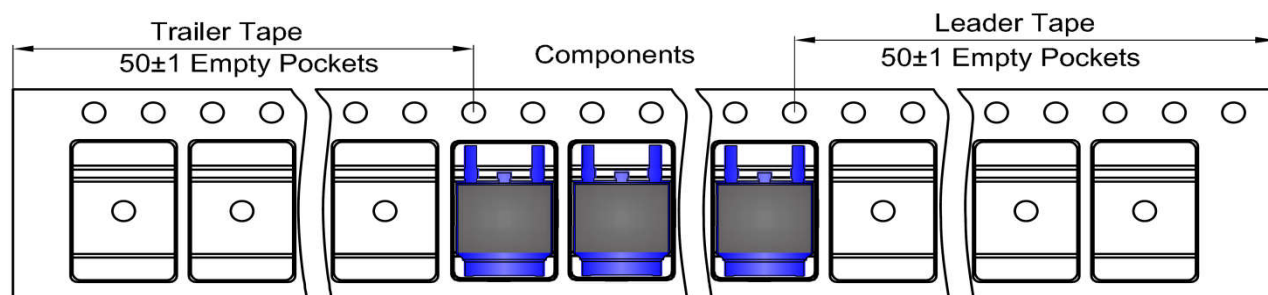
TO-252 TAPE AND REEL

TO-252 Embossed Carrier Tape

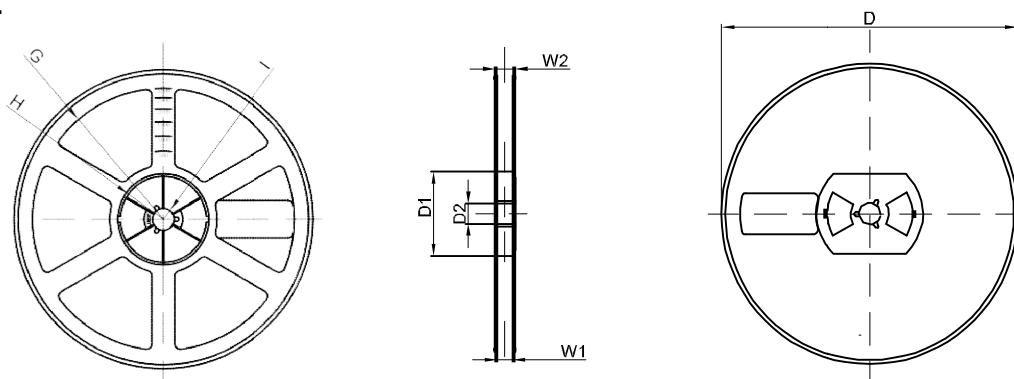


DIMENSIONS ARE IN MILLIMETER										
TYPE	A	B	C	d	E	F	P0	P	P1	W
TO-252	6.90	10.50	2.70	Ø1.55	1.75	7.50	4.00	8.00	2.00	16.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

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