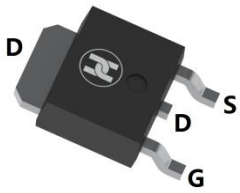
N-CHANNEL HIGH VOLTAGE MOSFET

FEATURES

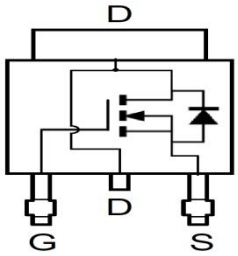
- V_{DS}=200V,$R_{DS(ON)}$≤750mΩ@V_{GS}=10V,I_D=2.3A
- Low input capacitance
- Low on-resistance and Low gate drive voltage (Logic level capable)
- Fast switching speed
- High avalanche energy pulse withstand capability
- For Power Management Functions and SLIC line drivers for VoIP applications
- For Transformer Driving Switch and Motor control Applications
- For Uninterrupted power supply Applications
- Surface Mount device



TO-252

MECHANICAL DATA

- Case: TO-252(DPAK)
- Case Material: Molded Plastic. UL flammability
- Classification Rating: 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Weight: 0.33 grams (approximate)



MAXIMUM RATINGS (T_A = 25°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	T_C = +25°C(Note2)	I_D	2.3	A
	T_C= +70°C(Note2)		1.8	
	T_C = +25°C(Note1)		1.5	
Pulsed drain current(V_{GS} = 10V,Note3)		I_{DM}	17.2	A
Single Pulsed Avalanche Energy(Note6)		E_{AS}	73	mJ
Single Pulsed Avalanche Current(Note6)		I_{AS}	5.5	A
Repetitive Avalanche Energy(Note3)		E_{AR}	4.5	mJ
Repetitive Avalanche Current(Note3)		I_{AR}	5.5	A
Continuous Source current (Body diode)(Note2)		I_S	5.7	A
Pulsed Source current (Body diode)(Note3)		I_{SM}	17.3	A
Power dissipation	Note 1	P_D	4.3	W
	Note 2		10.2	
	Note 5		2.2	
Thermal resistance from Junction to ambient	Note 1	$R_{\theta JA}$	29.1	°C/W
	Note 2		12.3	
	Note 5		57.3	
Thermal Resistance, Junction to Lead (Note4)		$R_{\theta JL}$	1.15	°C/W
Operating and Storage temperature		T_J,T_{STG}	-55 ~+150	°C

Notes:1. For a device surface mounted on 50mm x 50mm x 1.6mm FR4 PCB with high coverage of single sided 2oz copper, in still air conditions; the device is measured when operating in a steady-state condition.

2. Same as note 1, except the device is measured at t ≤ 10 sec.

3. Same as note 1, except the device is operating in a repetitive state with pulse width and duty cycle limited by maximum junction temperature.

4. Thermal resistance from junction to solder-point (at the end of the drain lead).

5. For a device surface mounted on 25mm x 25mm x 1.6mm FR4 PCB with the high coverage single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.

6. UIS in production with L = 4.83mH, I_{AS} = 5.5A, R_G = 25Ω, V_{DD} = 100V, starting T_J = 25°C.

N-CHANNEL HIGH VOLTAGE MOSFET

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

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
OFF CHARACTERISTICS						
Drain-Source breakdown voltage	$V_{(BR)DSS}$	200			V	V_{GS}=0V, I_D=250μA
Zero gate voltage drain current	I_{DSS}			0.5	μA	V_{DS}=200V, V_{GS}=0V
Gate-body leakage current	I_{GSS}			±100	nA	V_{DS}=0V, V_{GS}=±20V
ON CHARACTERISTICS						
Gate-threshold voltage	$V_{GS(th)}$	1	1.6	2.5	V	V_{DS}=V_{GS}, I_D=250μA
Drain-source on-resistance (Note 7)	$R_{DS(ON)}$		650	750	mΩ	V_{GS}=10V, I_D=2.75A
			670	780	mΩ	V_{GS}=5V, I_D=2.75A
Forward Trans-conductance (Note 7 &8)	g_{fs}		6.13		S	V_{DS}=30V, I_D=2.75A
Diode forward voltage (Note 7)	V_{SD}		0.86	0.95	V	I_S=5.5A, V_{GS}=0V
Body Diode Reverse Recovery Time(Note8)	t_{rr}		177		nS	I_S=6.5A,di/dt= 100A/μs
Body Diode Reverse Recovery Charge(Note8)	Q_{rr}		1.4		μC	
DYNAMIC CHARACTERISTICS (Note 8)						
Input capacitance	C_{iss}		358		pF	V_{DS}=25V, V_{GS}=0V, f=1MHz
Output capacitance	C_{oss}		50		pF	
Reverse transfer capacitance	C_{rss}		6.1		pF	
Total gate charge(Note9)	Q_g		8.1		nC	V_{DS}=120V,V_{GS}=5V,I_D=6.5A
Gate-source charge(Note9)	Q_{gs}		1.4		nC	
Gate-drain charge(Note9)	Q_{gd}		3.9		nC	
Turn-on delay time(Note9)	$t_{d(on)}$		17.8		nS	V_{DD}=100V,V_{GS}=5V I_D=6.5A,R_G=25Ω
Turn-on rise time(Note9)	t_r		76.9		nS	
Turn-off delay time(Note9)	$t_{d(off)}$		44.7		nS	
Turn-off fall time(Note9)	t_f		57.1		nS	

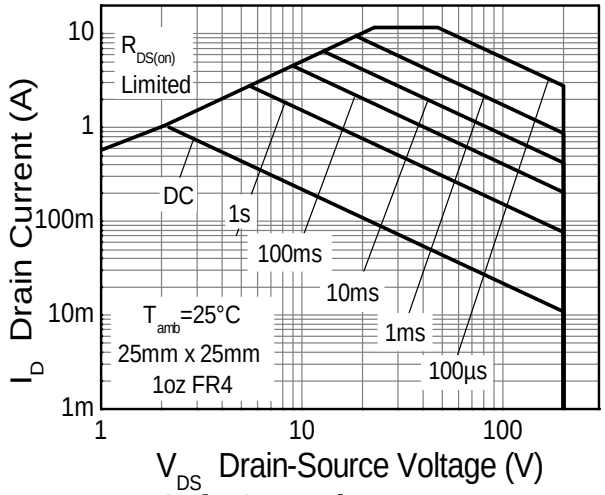
Notes: 7. Measured under pulsed conditions. Pulse width ≤ 300μs; duty cycle ≤ 2%

8. For design aid only, not subject to production testing.

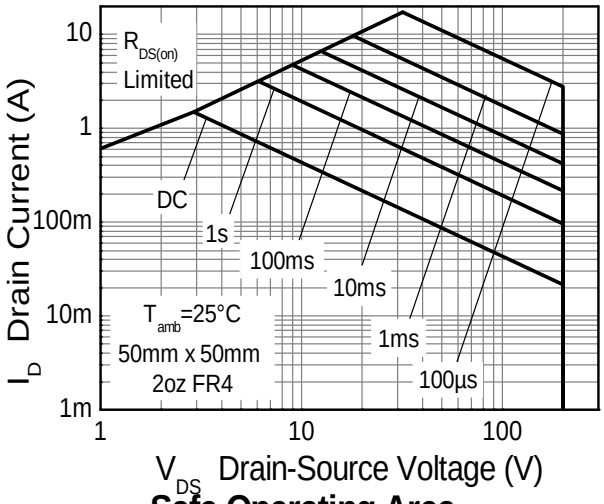
9. Switching characteristics are independent of operating junction temperatures.

N-CHANNEL HIGH VOLTAGE MOSFET

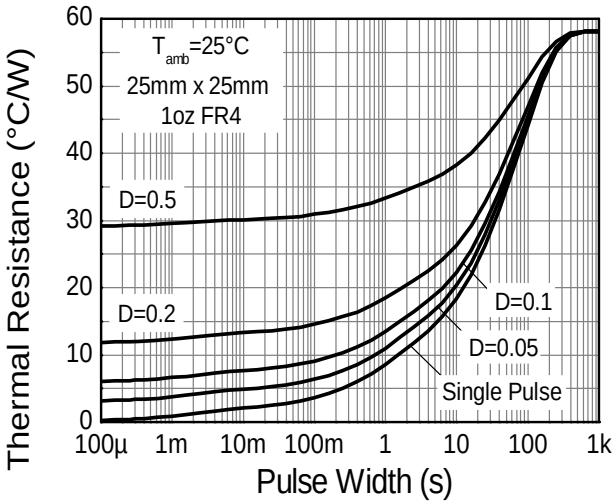
Thermal Characteristics



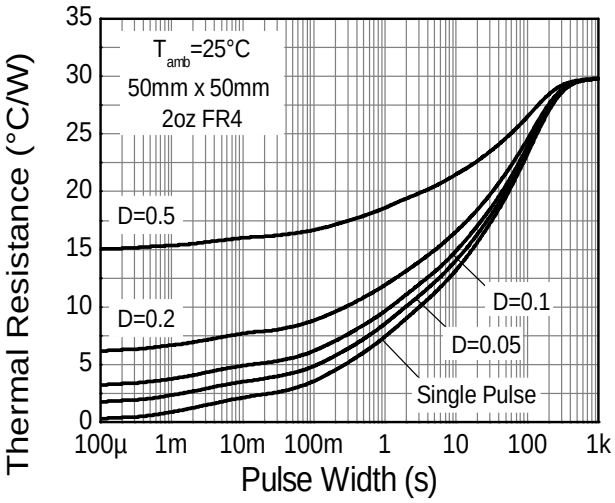
Safe Operating Area



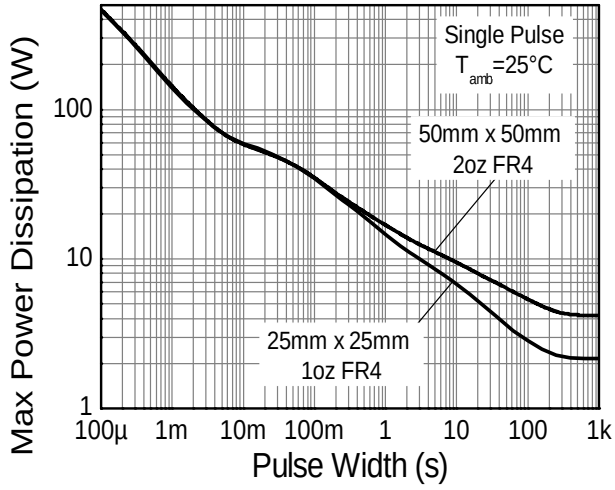
Safe Operating Area



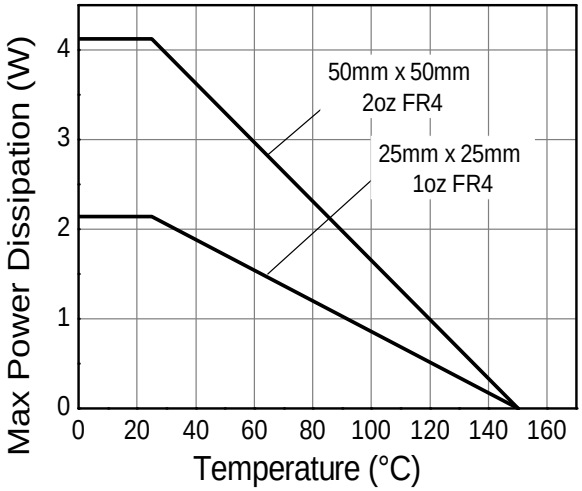
Transient Thermal Impedance



Transient Thermal Impedance



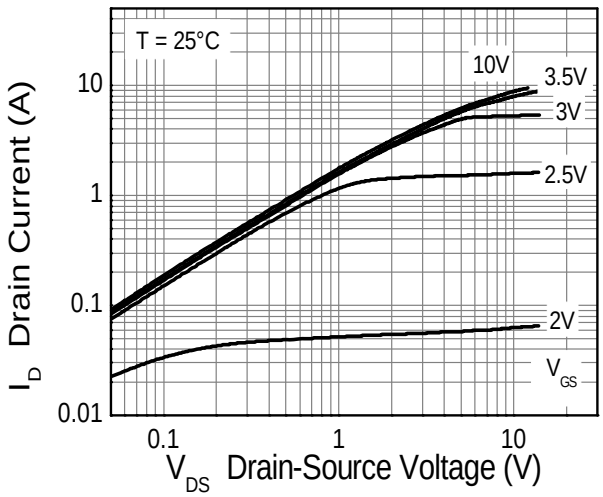
Pulse Power Dissipation



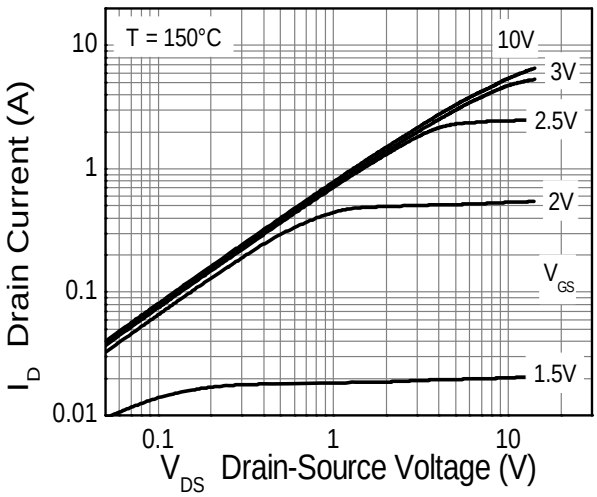
Derating Curve

N-CHANNEL HIGH VOLTAGE MOSFET

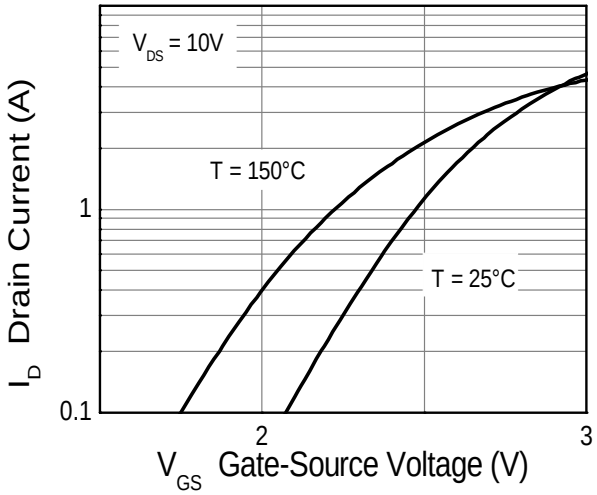
Typical Characteristics



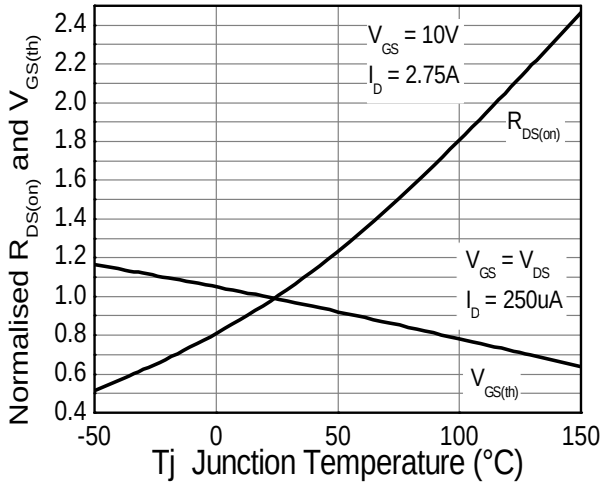
Output Characteristics



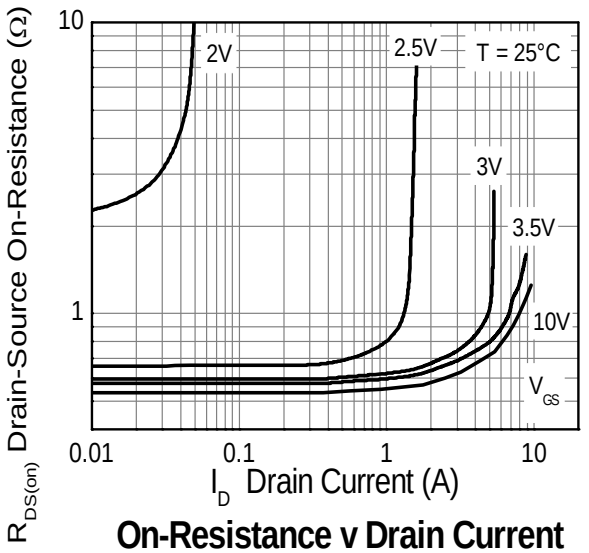
Output Characteristics



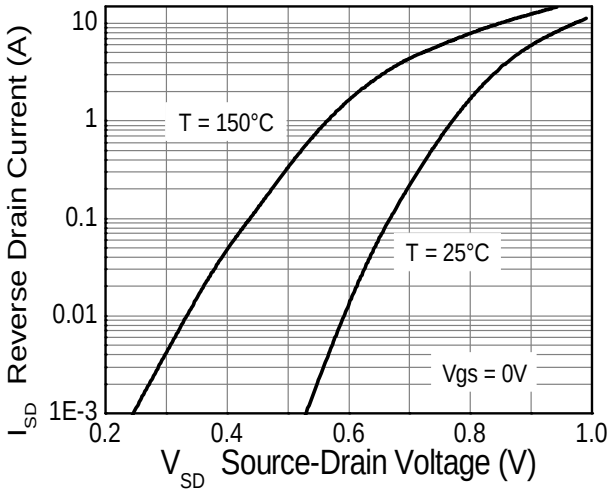
Typical Transfer Characteristics



Normalised Curves v Temperature



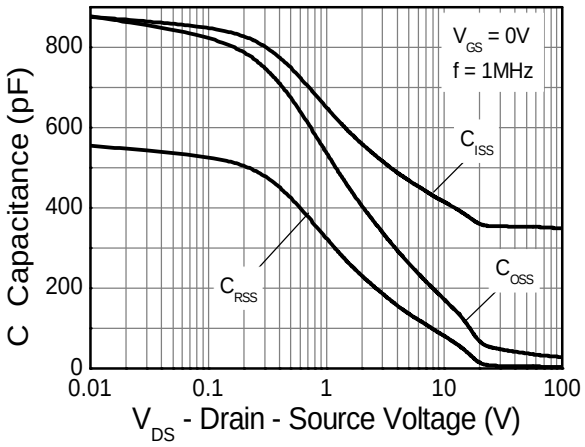
On-Resistance v Drain Current



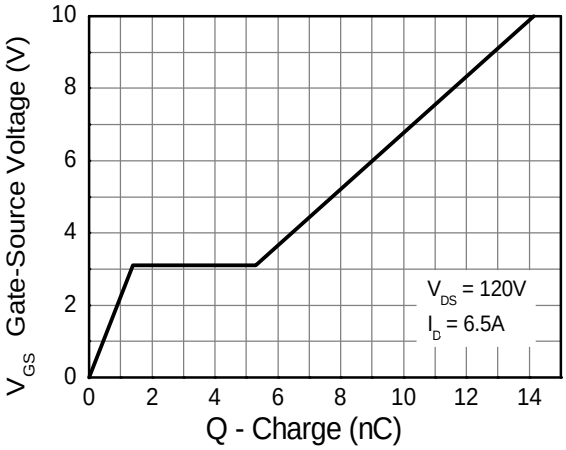
Source-Drain Diode Forward Voltage

N-CHANNEL HIGH VOLTAGE MOSFET

Typical Characteristics - continued

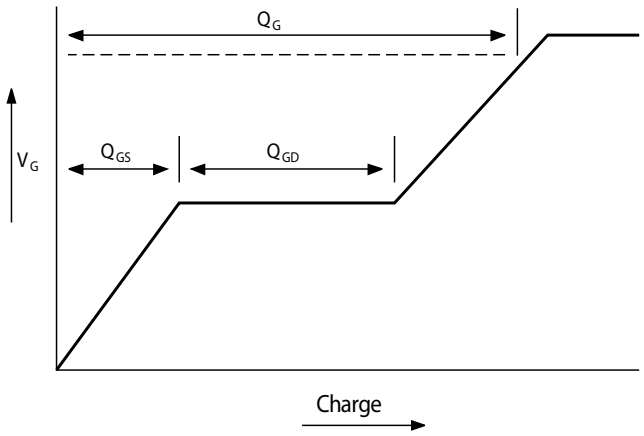


Capacitance v Drain-Source Voltage

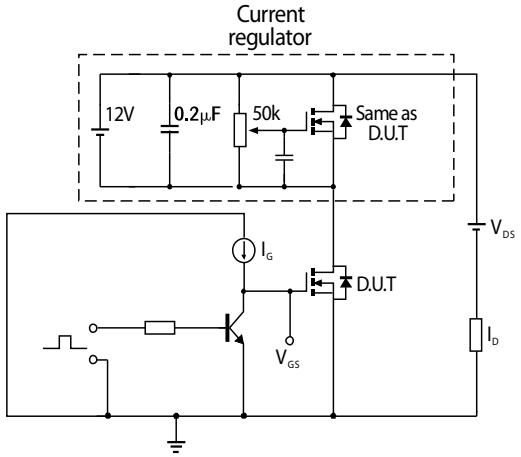


Gate-Source Voltage v Gate Charge

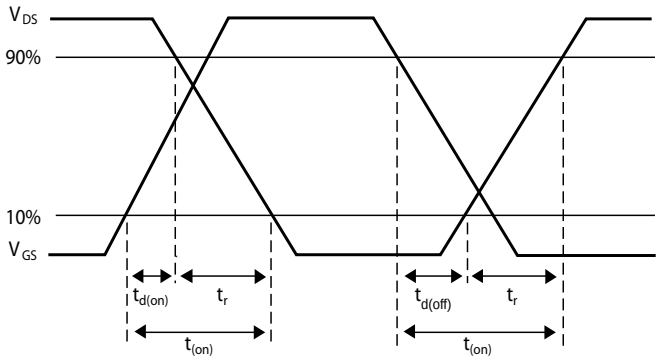
Test Circuits



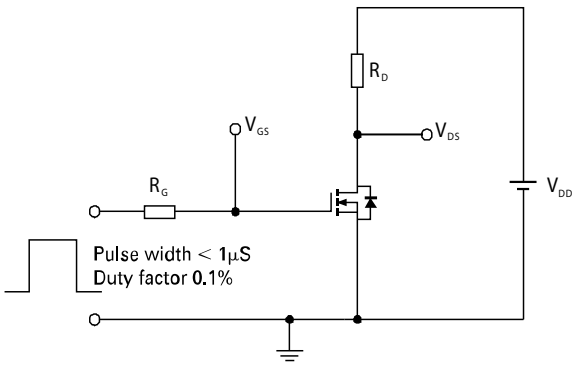
Basic gate charge waveform



Gate charge test circuit



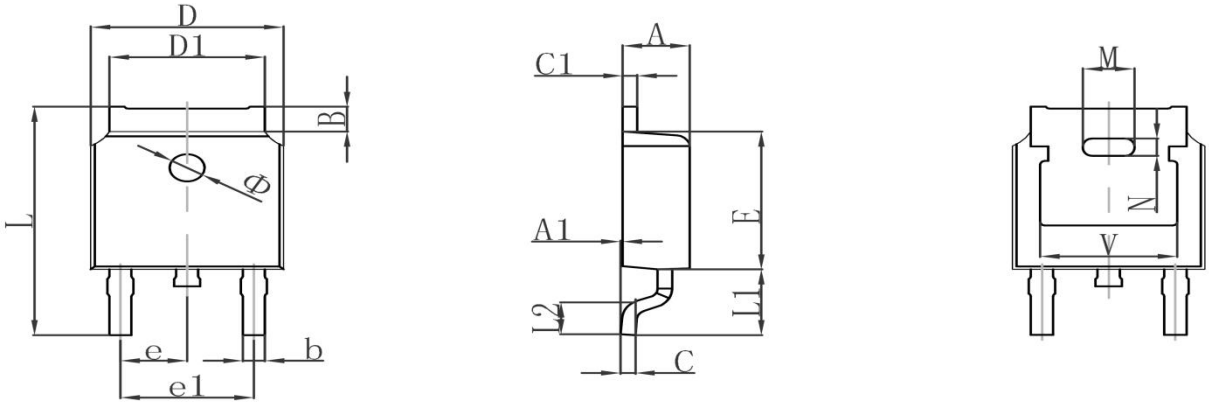
Switching time waveforms



Switching time test circuit

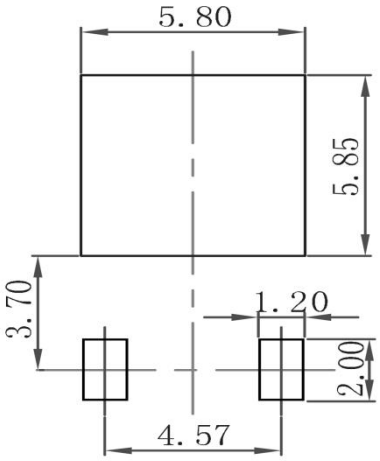
N-CHANNEL HIGH VOLTAGE MOSFET

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

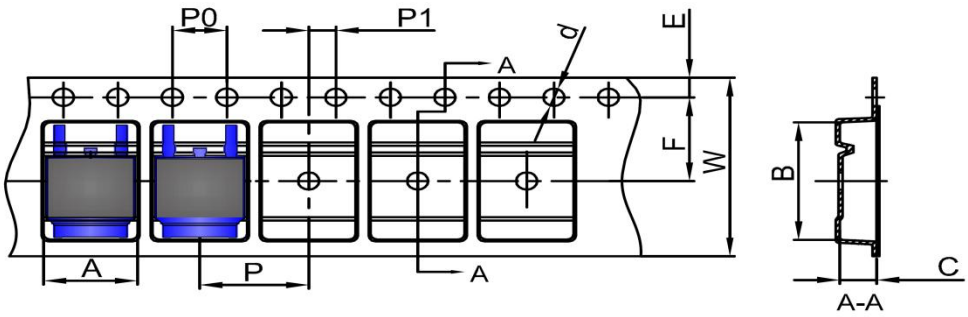
2.General tolerance: ±0.05mm

3.The pad layout is for reference purposes only

N-CHANNEL HIGH VOLTAGE MOSFET

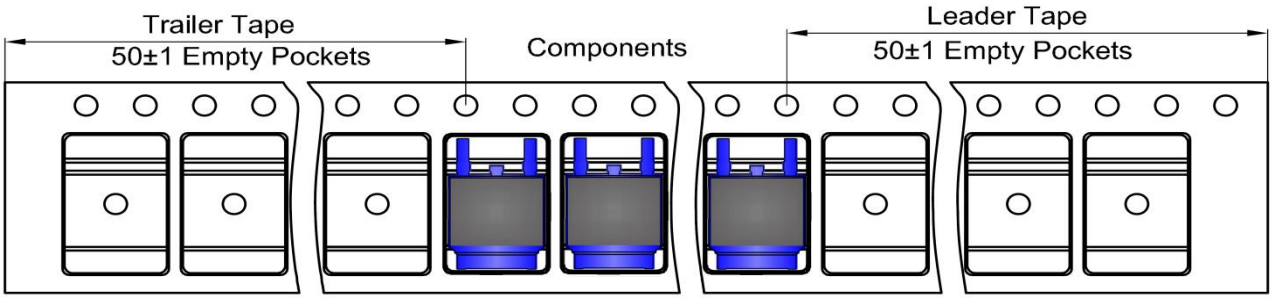
TO-252 Tape and Reel

TO-252 Embossed Carrier Tape

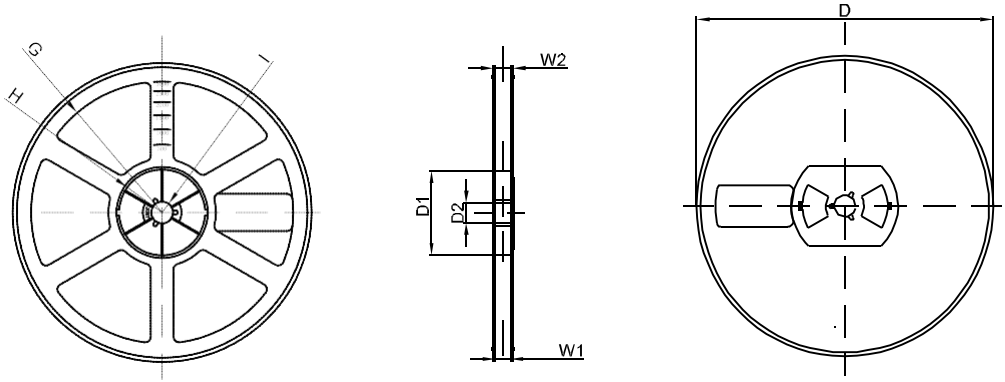


	DIMENSIONS ARE IN MILLIMETER									
TYPE	A	B	C	d	E	F	P0	P	P1	W
TO-252	6.90	10.50	2.70	Ø1.55	1.75	7.50	4.00	8.00	2.00	16.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

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