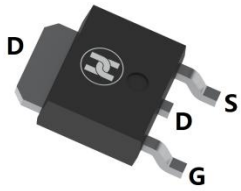
P-CHANNEL HIGH VOLTAGE MOSFET

FEATURES

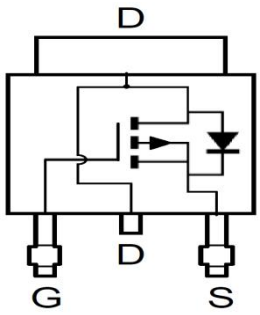
- V_{DS}=-100V,$R_{DS(ON)}$≤350mΩ@V_{GS}=-10V,I_D=-3.9A
- Low Input Capacitance and Fast switching speed
- Low gate drive
- For Power Management Functions and DC-DC Converters Applications
- For Disconnect switches and Motor control Applications
- Surface Mount device



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}	-100	V
Gate-source voltage		V_{GS}	±20	V
Continuous drain current, V_{GS} = -10V	T_A = +25°C(Note2)	I_D	-3.9	A
	T_A= +70°C(Note2)		-3.1	
	T_A = +25°C(Note1)		-2.4	
Pulsed drain current V_{GS}= -10V	(Note3)	I_{DM}	-11.3	A
Maximum Body Diode Forward Current	(Note2)	I_S	-8.7	A
Pulsed source current (body diode)	(Note3)	I_{SM}	-11.3	A
Power dissipation	T_A = +25°C(Note1)	P_D	4.0	W
	T_A= +25°C(Note2)		10.2	
	T_A = +25°C(Note5)		2.0	
Thermal resistance from Junction to ambient	(Note1)	$R_{\theta JA}$	31	°C/W
	(Note2)		12.3	
	(Note5)		62	
Thermal Resistance, Junction to Case (Note4)		$R_{\theta JL}$	2.4	°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 pulsed with D= 0.02 and pulse width 300μs. The pulse current is limited by the 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 high coverage of single sided 1oz copper, in still air conditions; the device is measured when operating in a steady-state condition.

P-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	$V_{(BR)DSS}$	-100			V	V_{GS}=0V, I_D=-250μA
Zero gate voltage drain current	I_{DSS}			-0.5	μA	V_{DS}=-100V, V_{GS}=0V
Gate-body leakage current	I_{GSS}			±100	nA	V_{DS}=0V, V_{GS}=±20V
ON characteristics						
Gate-threshold voltage	$V_{GS(th)}$	-2.0		-4.0	V	V_{DS}=V_{GS}, I_D=-250μA
Drain-source on-resistance (Note6)	$R_{DS(ON)}$			350	mΩ	V_{GS}=-10V, I_D=-1.4A
				450	mΩ	V_{GS}=-6V, I_D=-1.2A
Forward trans-conductance(Note6&7)	g_{fs}		2.8		S	V_{DS}=-15V, I_D=-1.4A
Dynamic characteristics(Note7)						
Input capacitance	C_{iss}		424		pF	V_{DS}=-50V, V_{GS}=0V, f=1MHz
Output capacitance	C_{oss}		36.6		pF	
Reverse transfer capacitance)	C_{rss}		29.8		pF	
Switching characteristics (Note7&8)						
Turn-on delay time	$t_{d(on)}$		3.0		nS	V_{DD}=-50V, I_D=-1A, R_g=6.0Ω, V_{GS}=-10V
Turn-on rise time	t_r		3.5		nS	
Turn-off delay time	$t_{d(off)}$		13.4		nS	
Turn-off fall time	t_f		7.2		nS	
Total gate charge	Q_g		7.1		nC	V_{DS}=-50V,V_{GS}=-6V,I_D=-1.4A
Total gate charge	Q_g		10.7		nC	V_{DS}=-50V,V_{GS}=-10V,I_D=-1.4A
Gate-source charge	Q_{gs}		1.7		nC	
Gate-drain charge	Q_{gd}		3.8		nC	
Source-drain diode characteristics						
Diode forward voltage (Note6)	V_{SD}		-0.85	-0.95	V	I_S=-1.7A, V_{GS}=0V
Body Diode Reverse Recovery Time(Note7)	t_{rr}		33		nS	I_S=-1.5A,dI/dt= 100A/μs
Body Diode Reverse Recovery Charge(Note7)	Q_{rr}		48		nC	

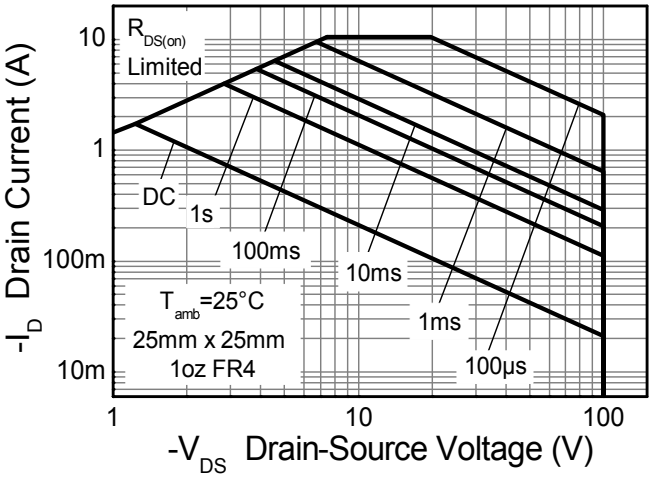
Notes: 6. Measured under pulsed conditions. Pulse width≤300μs; duty cycle≤2%.

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

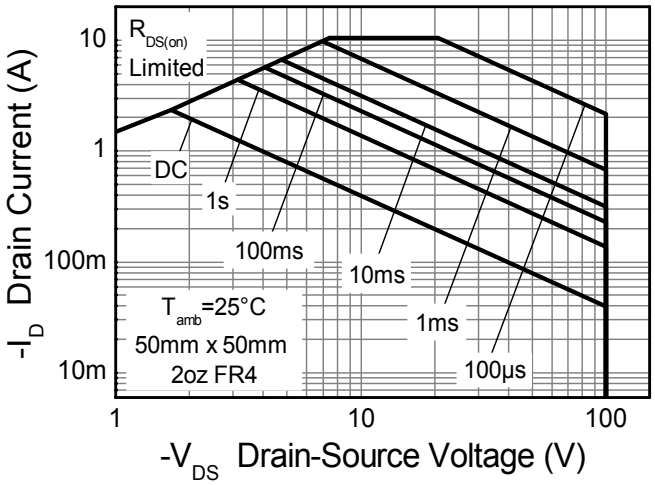
8. Switching characteristics are independent of operating junction temperature.

P-CHANNEL HIGH VOLTAGE MOSFET

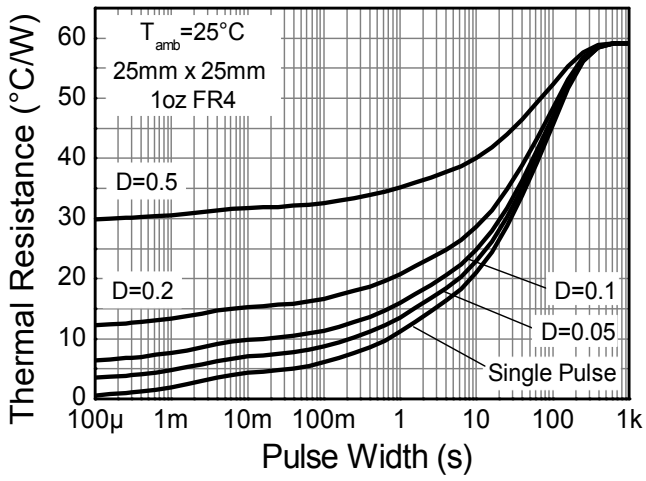
Thermal Characteristics



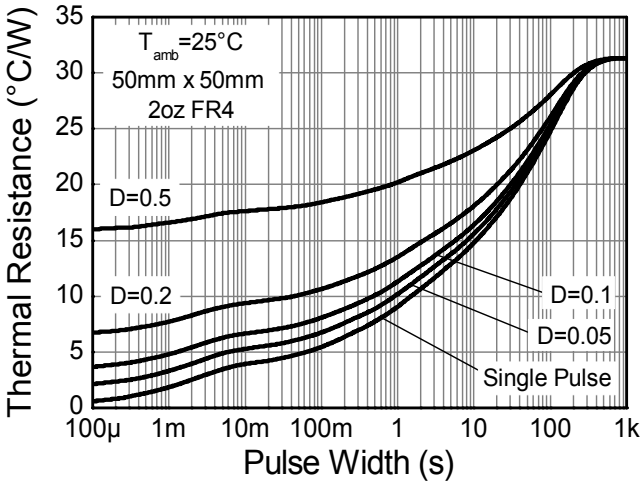
Safe Operating Area



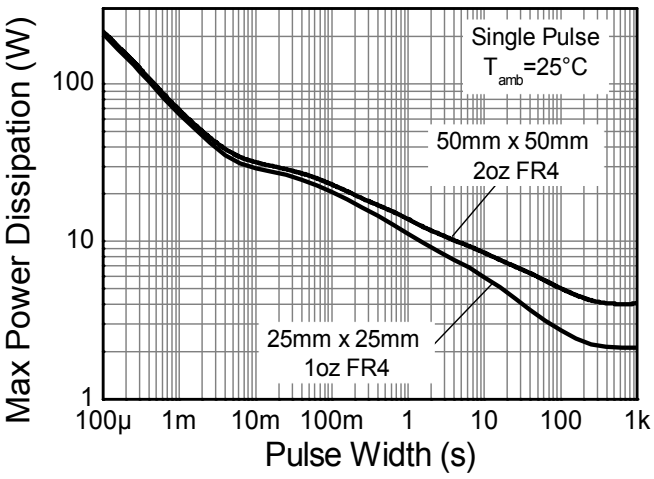
Safe Operating Area



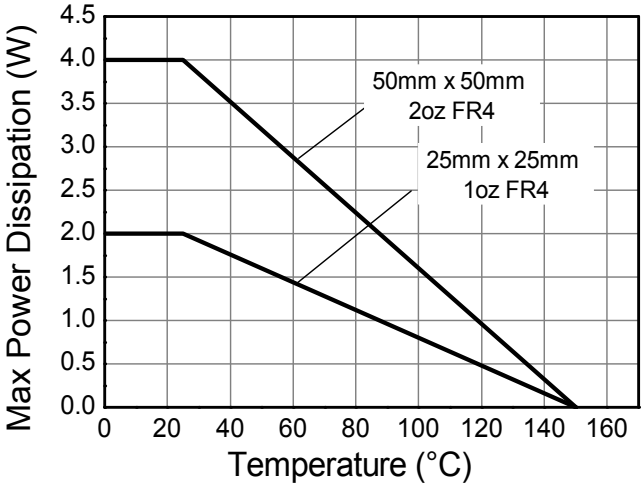
Transient Thermal Impedance



Transient Thermal Impedance



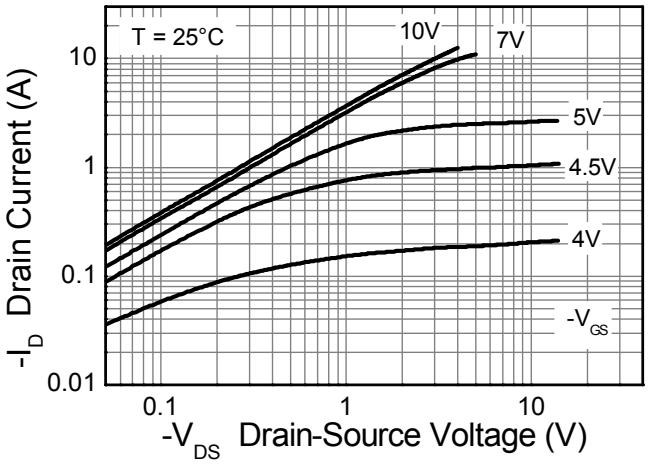
Pulse Power Dissipation



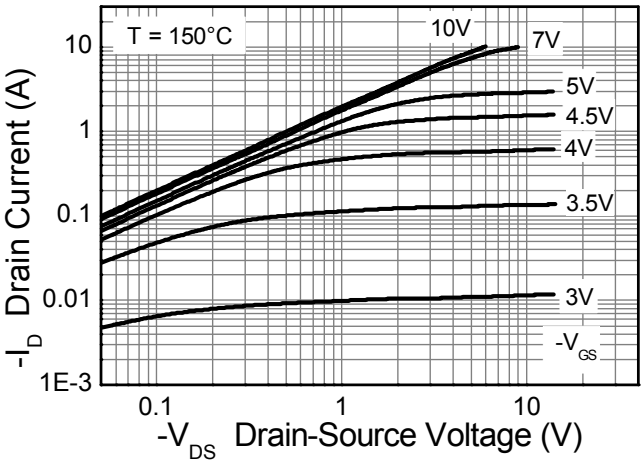
Derating Curve

P-CHANNEL HIGH VOLTAGE MOSFET

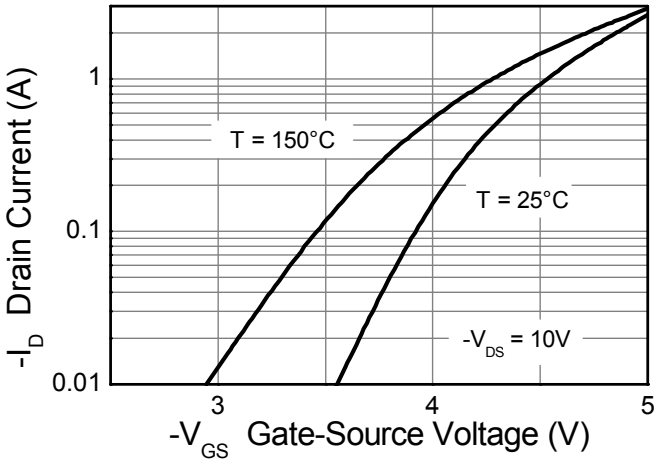
Typical Characteristics



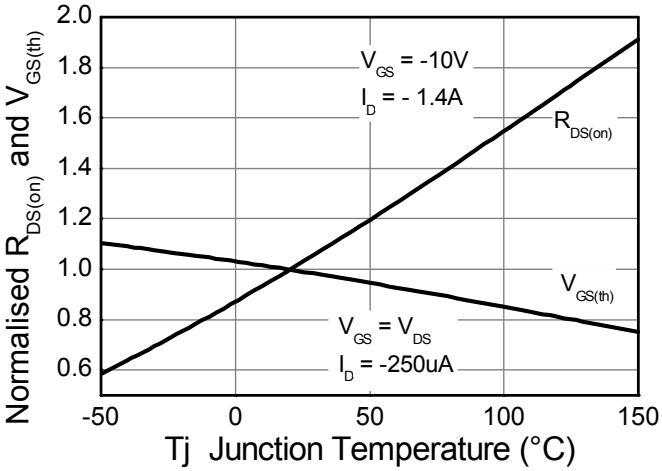
Output Characteristics



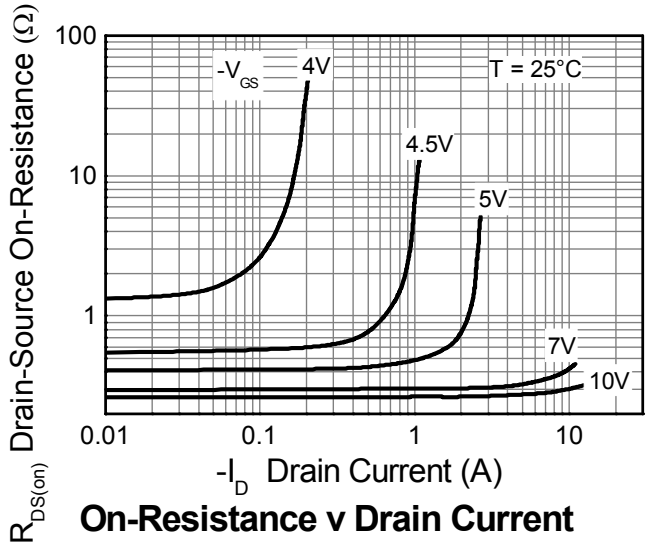
Output Characteristics



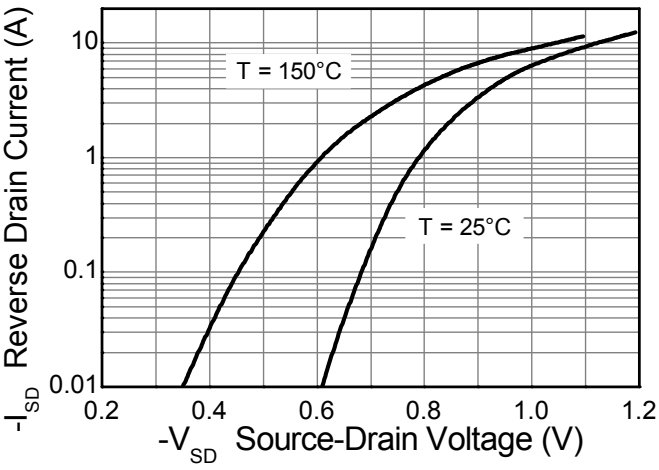
Typical Transfer Characteristics



Normalised Curves v Temperature



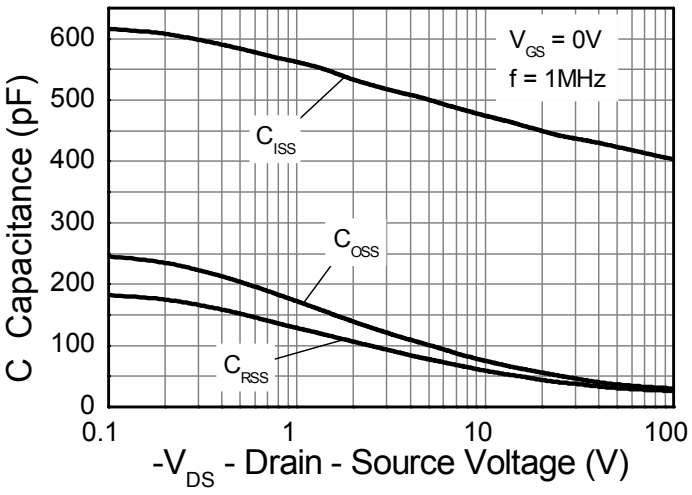
On-Resistance v Drain Current



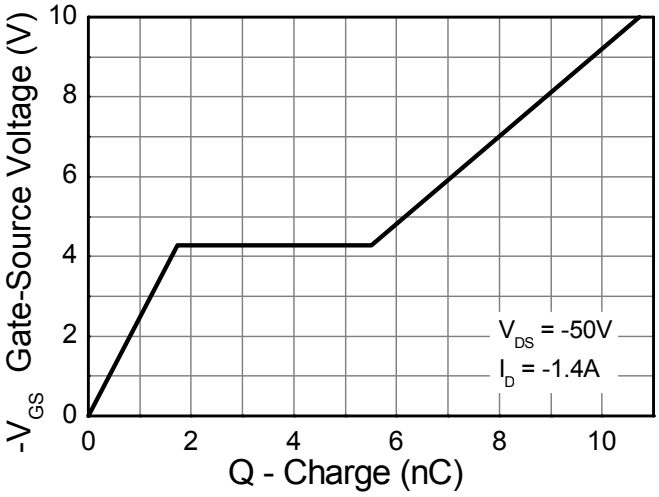
Source-Drain Diode Forward Voltage

P-CHANNEL HIGH VOLTAGE MOSFET

Typical Characteristics

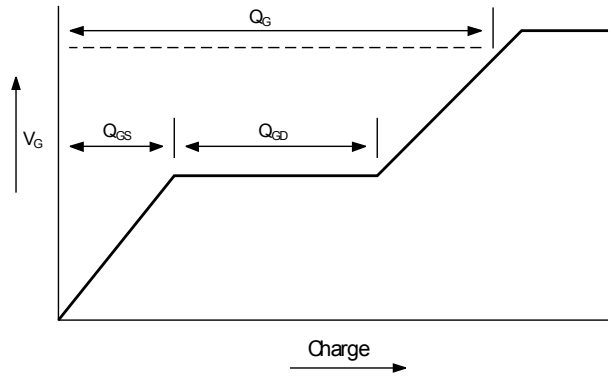


Capacitance v Drain-Source Voltage

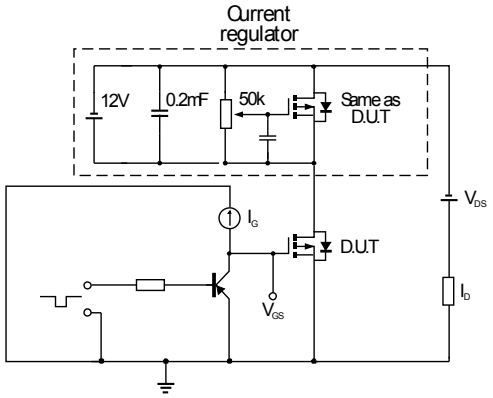


Gate-Source Voltage v Gate Charge

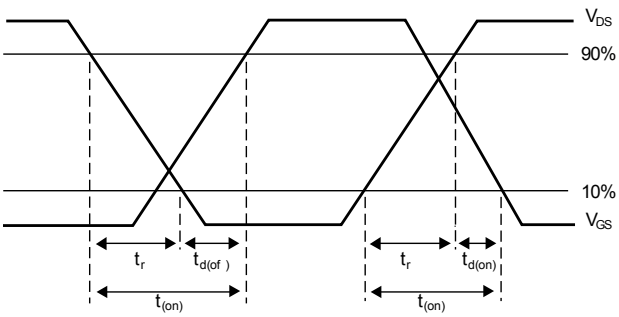
Test Circuits



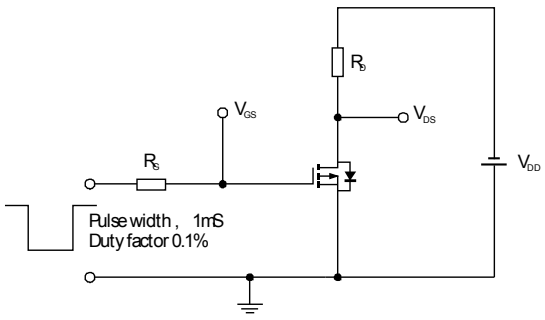
Basic gate charge waveform



Gate charge test circuit



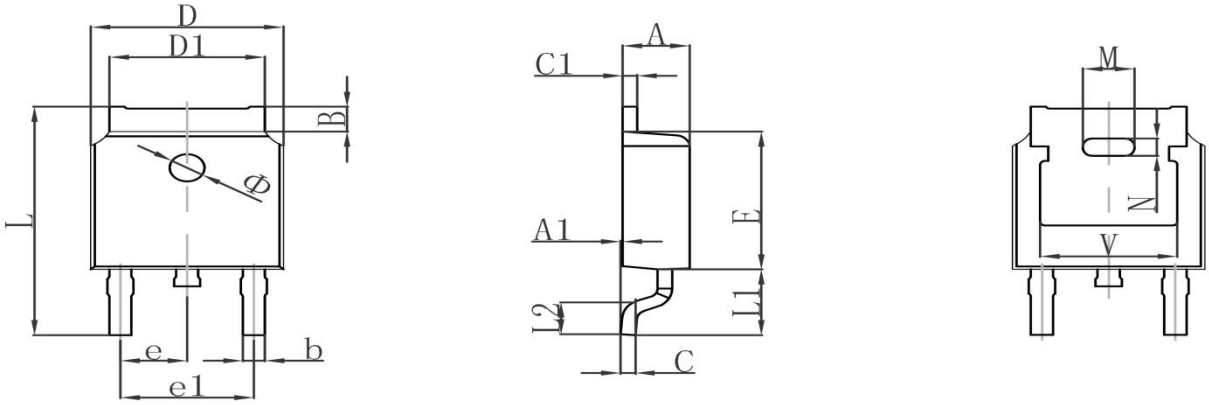
Switching time waveforms



Switching time test circuit

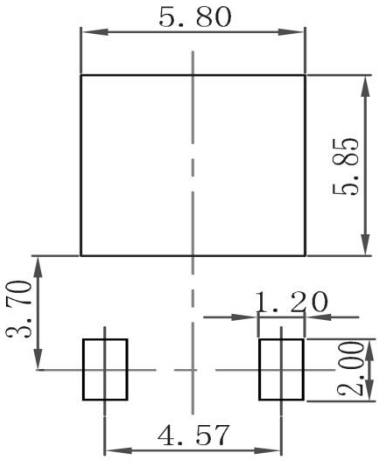
P-CHANNEL HIGH VOLTAGE MOSFET

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

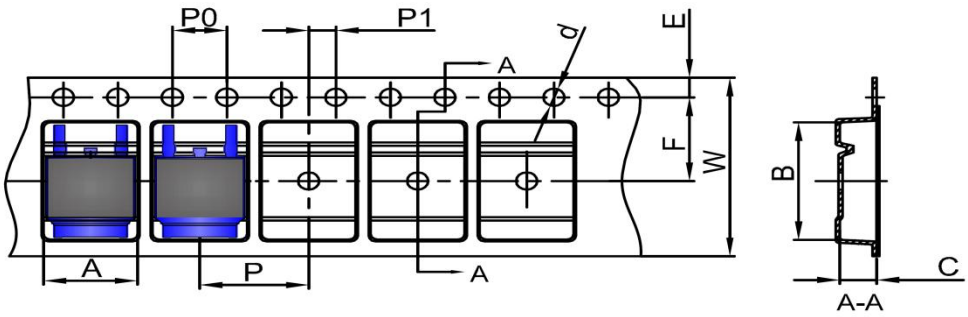
2.General tolerance: ±0.05mm

3.The pad layout is for reference purposes only

P-CHANNEL HIGH VOLTAGE MOSFET

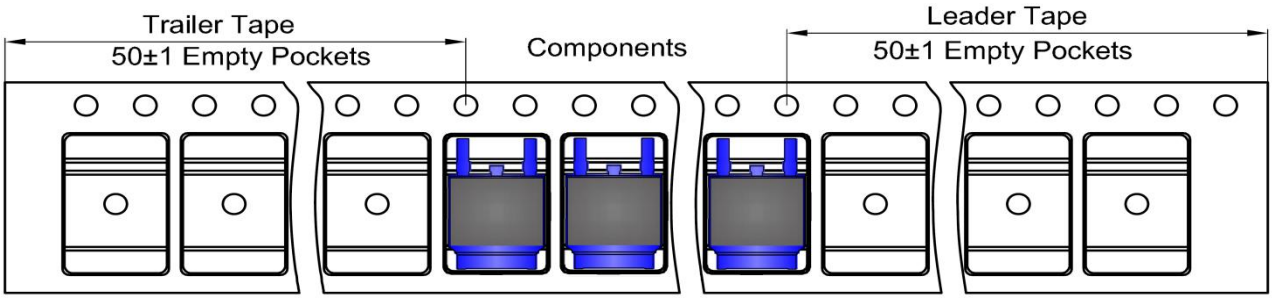
TO-252 Tape and Reel

TO-252 Embossed Carrier Tape

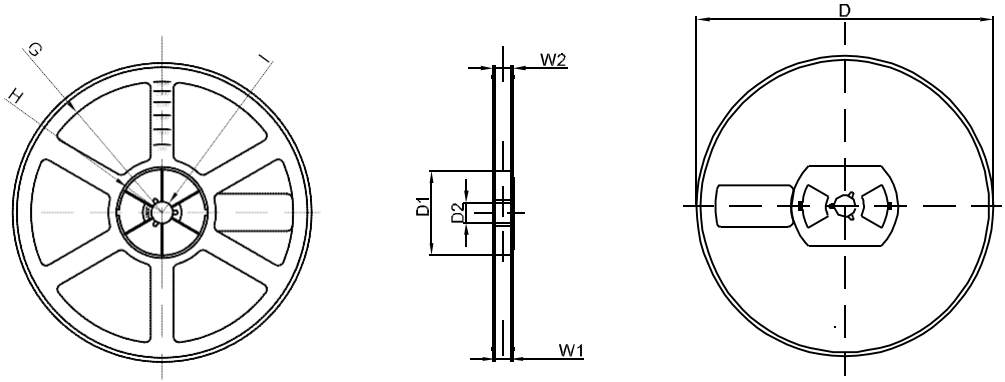


	DIMENSIONS ARE IN MILLIMETER									
TYPE	A	B	C	d	E	F	P0	P	P1	W
TO-252	6.90	10.50	2.70	Ø1.55	1.75	7.50	4.00	8.00	2.00	16.00
TOLERANCE	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1

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