

## FTK10N10 N-Channel Power MOSFET

### GENERAL DESCRIPTION

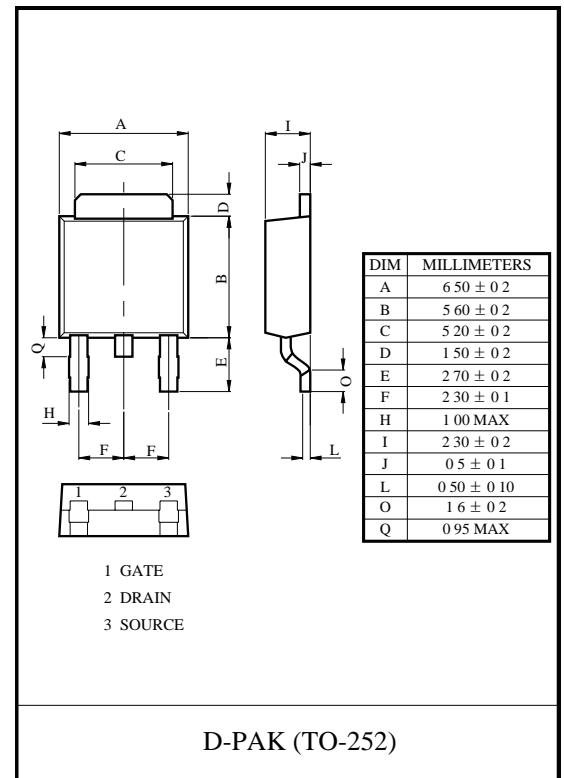
The FTK10N10 provide excellent  $R_{DS(ON)}$ , low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

### FEATURE

- Excellent package for good heat dissipation
- Ultra low gate charge
- Low reverse transfer capacitance
- Fast switching capability
- Avalanche energy specified

### APPLICATION

- Power switching application



### Maximum ratings ( $T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	± 20	
Continuous Drain Current	$I_D$	9.6	A
Pulsed Drain Current	$I_{DM}$	38.4	
Single Pulsed Avalanche Energy (note1)	$E_{AS}$	150	mJ
Maximum Power Dissipation ( $T_c=25^\circ\text{C}$ )	$P_D$	30	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	100	$^\circ\text{C}/\text{W}$
Junction Temperature	$T_J$	150	°C
Storage Temperature Range	$T_{STG}$	- 55 ~ +150	
Maximum lead temperature for soldering purposes , 1/8" from case for 5 seconds	$T_L$	260	



# FTK10N10

## Electrical characteristics (T<sub>a</sub>=25°C unless otherwise noted)

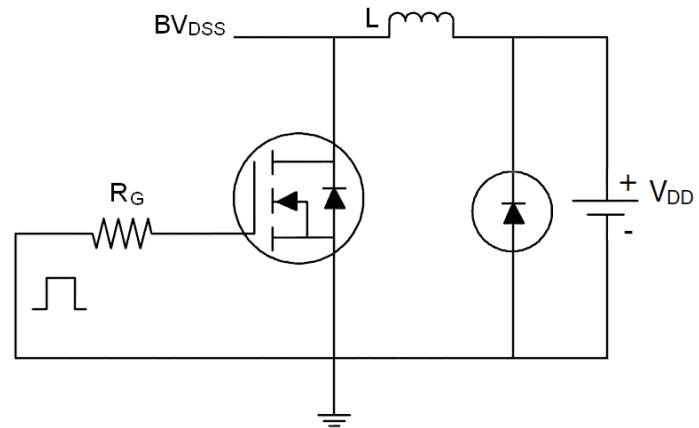
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Off characteristics</b>						
Drain- source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> =250μA	100			V
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V			1	μA
Gate- body leakage current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
<b>On characteristics (note2)</b>						
Gate-threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.2		2.5	V
Static drain- source on- resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =5A			0.14	Ω
Forward transconductance	g <sub>fs</sub>	V <sub>DS</sub> =25V, I <sub>D</sub> =6A	3.5	.		S
<b>Dynamic characteristics (note 3)</b>						
Input capacitance	C <sub>iss</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f =1MHz		690		pF
Output capacitance	C <sub>oss</sub>			120		
Reverse transfer capacitance	C <sub>rss</sub>			90		
<b>Switching characteristics (note 3)</b>						
Turn-on delay time	t <sub>d(on)</sub>	V <sub>DD</sub> =30V, R <sub>G</sub> =2.5Ω, I <sub>D</sub> =2A, V <sub>GS</sub> =10V		11		ns
Turn-on rise time	t <sub>r</sub>			7.4		
Turn-off delay time	t <sub>d(off)</sub>			35		
Turn-off fall time	t <sub>f</sub>			9.1		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =30V, V <sub>GS</sub> =10V, I <sub>D</sub> =3A		15.5		nC
Gate-Source Charge	Q <sub>gs</sub>			3.2		nC
Gate-Drain Charge	Q <sub>gd</sub>			4.7		nC
<b>Drain-Source Diode Characteristics</b>						
Drain- source diode forward voltage (note2)	V <sub>SD</sub>	V <sub>GS</sub> = 0V, I <sub>S</sub> =9A			1.2	V
Continuous drain- source diode forward current	I <sub>S</sub>				9.6	A
Pulsed drain- source diode forward current	I <sub>SM</sub>				38.4	A

### Notes :

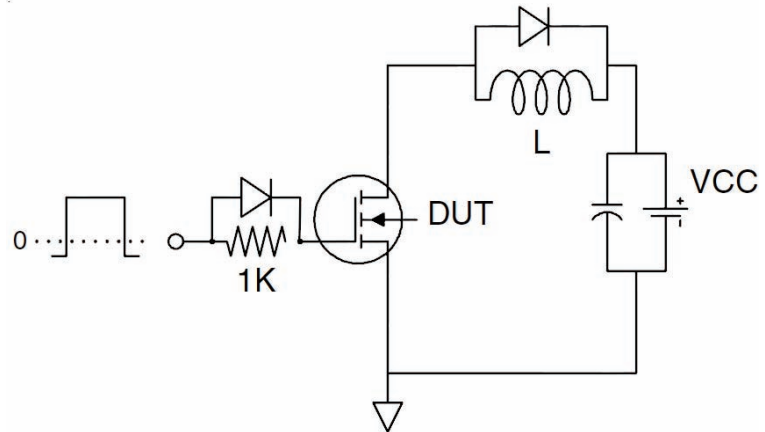
1. I<sub>L</sub>=10A, V<sub>DD</sub>=50V, R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C.
2. Pulse Test : Pulse width≤300μs, duty cycle≤2%.
3. Guaranteed by design not subject to production

## Test Circuit

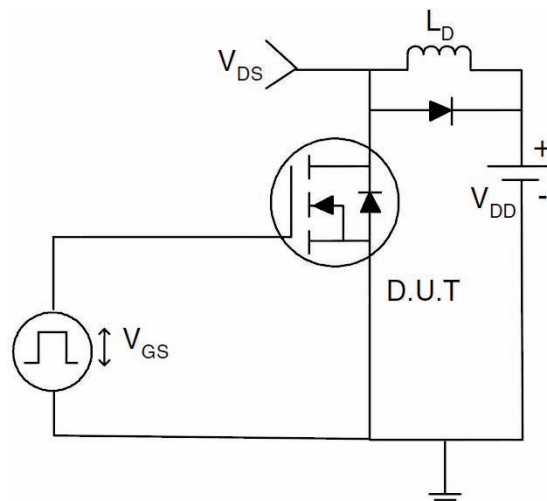
### 1) $E_{AS}$ test circuit



### 2) Gate charge test circuit



### 3) Switch Time Test Circuit



## Typical Electrical and Thermal Characteristics (curves)

Figure1. Source-Drain Diode Forward Voltage

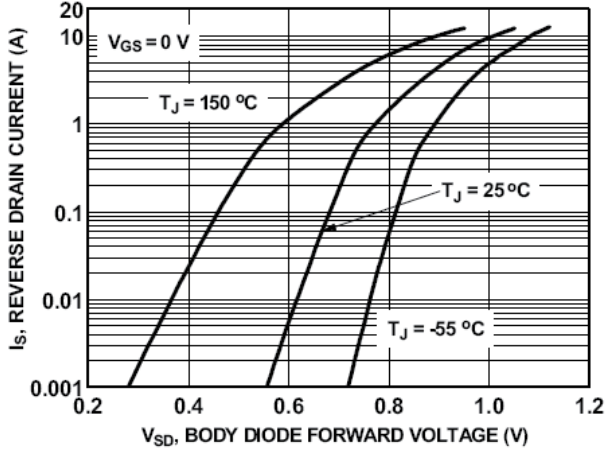


Figure2. Safe operating area

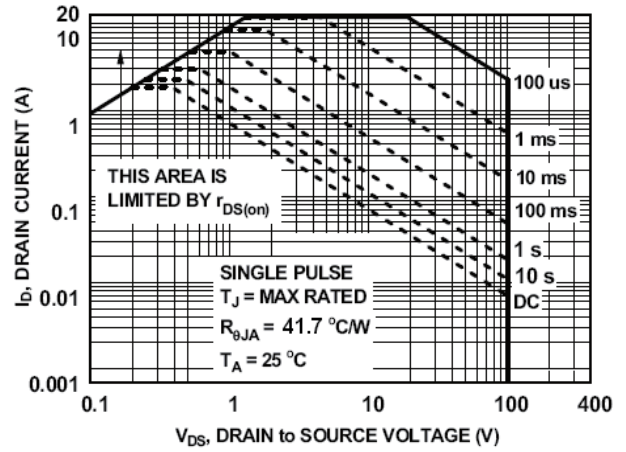


Figure3. Output characteristics

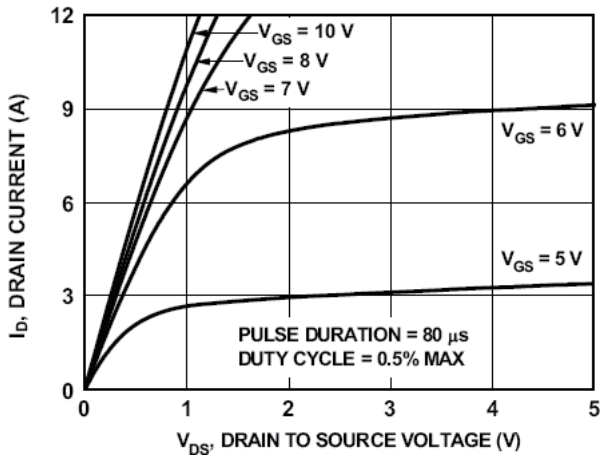


Figure4. Transfer characteristics

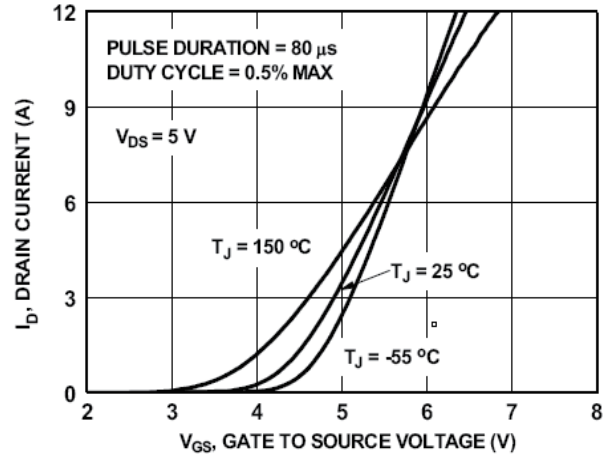


Figure5. Static drain-source on resistance

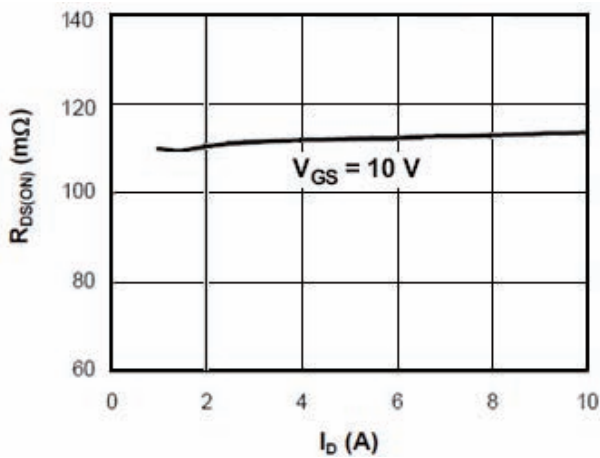
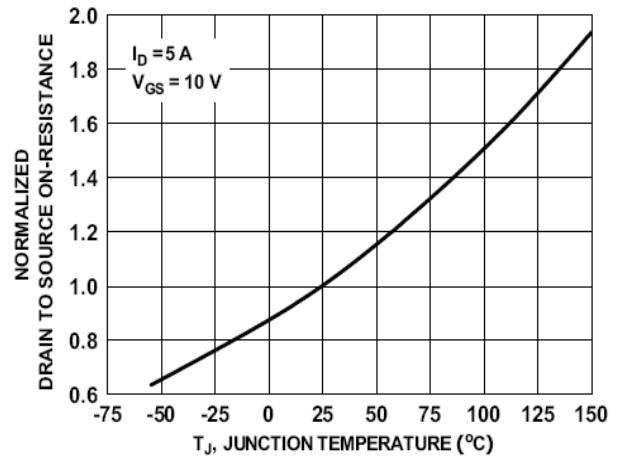
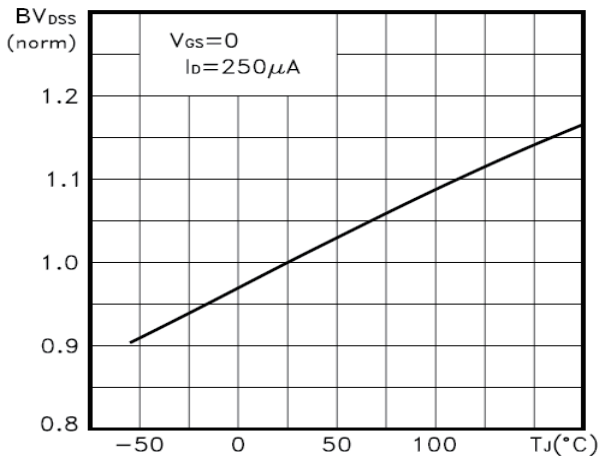


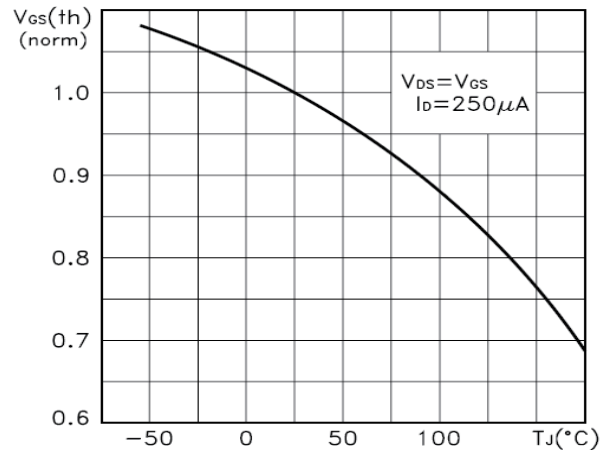
Figure6.  $R_{DS(on)}$  vs Junction Temperature



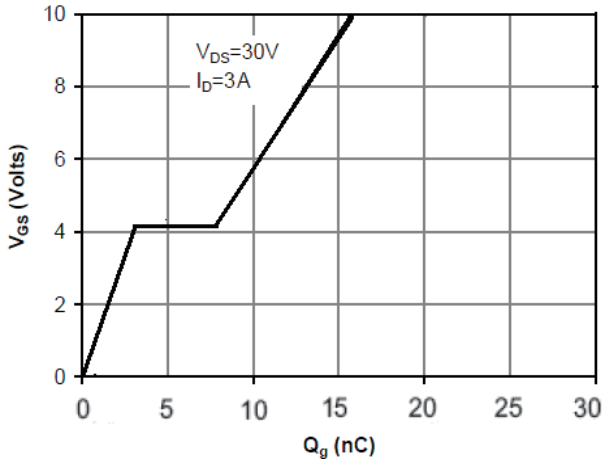
**Figure7.  $BV_{DSS}$  vs Junction Temperature**



**Figure8.  $V_{GS(th)}$  vs Junction Temperature**



**Figure9. Gate charge waveforms**



**Figure10. Capacitance**

