

N-Channel Power MOSFET

GENERAL DESCRIPTION

The FTK50N06D uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge.

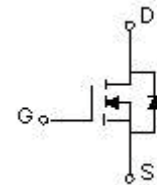
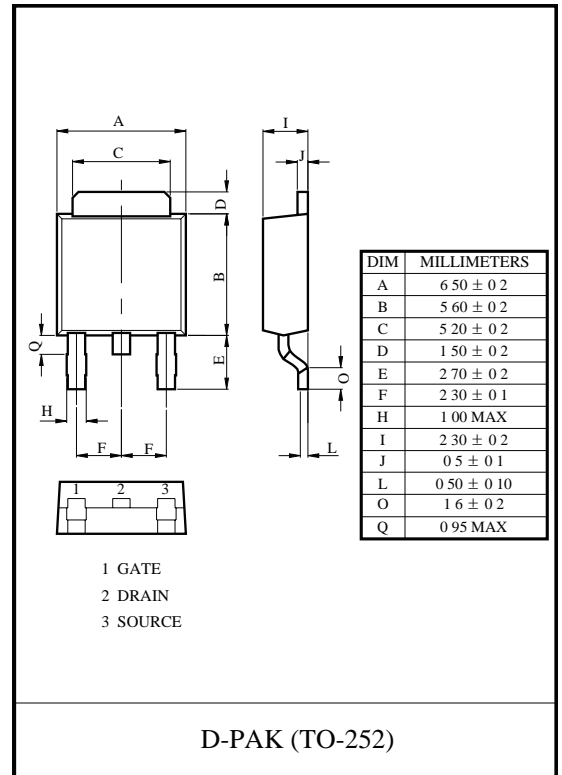
It can be used in a wide variety of applications.

FEATURE

- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

APPLICATION

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply



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

Parameter	Symbol	Value	Unit
Drain- Source Voltage	V_{DS}	60	V
Gate- Source Voltage	V_{GS}	± 20	
Continuous Drain Current	I_D	50	A
Pulsed Drain Current	I_{DM}	220	
Single Pulsed Avalanche Energy*	E_{AS}	115	mJ
Power Dissipation	P_D	1.25	W
Thermal Resistance from Junction to Ambient	P_{EJA}	100	$^\circ\text{C}/\text{W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{stg}	- 50 ~ +150	

* E_{AS} condition: $T_J=25^\circ\text{C}$, $V_{DD}=50\text{V}$, $L=0.5\text{mH}$, $R_G=25\Omega$, Starting $T_J = 25^\circ\text{C}$

**Electrical characteristics (T_a=25°C unless otherwise noted)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain - source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, b = 250μA	60			
Zero gate voltage drain current	I _{DSS}	V _{DS} = 60V, V _{GS} = 0V			1	μA
Gate - body leakage current	I _{GSS}	V _{DS} = 0V, V _{GS} = ± 20V			± 100	nA
On characteristics (note1)						
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.5		2.5	V
Static drain - source on - resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 20A		17	20	mΩ
Forward transconductance	g _{fs}	V _{DS} = 25V, I _D = 20A	24			S
Dynamic characteristics (note 2)						
Input capacitance	C _{iss}	V _{DS} = 25V, V _{GS} = 0V, f = 1MHz		900		pF
Output capacitance	C _{oss}			104		
Reverse transfer capacitance	C _{rss}			33		
Switching characteristics (note 2)						
Total gate charge	Q _g	V _{DS} = 30V, V _{GS} = 10V, I _D = 50A		30		nC
Gate - source charge	Q _{gs}			10		
Gate - drain charge	Q _{gd}			5		
Turn - on delay time	t _{d(on)}	V _{DD} = 30V, I _D = 2A, V _{GS} = 10V, R _G = 2.5Ω, R _L = 15Ω		25		ns
Turn - on rise time	t _r			5		
Turn - off delay time	t _{d(off)}			50		
Turn - off fall time	t _f			6		
Drain-Source Diode Characteristics						
Drain - source diode forward voltage(note1)	V _{SD}	V _{GS} = 0V, I _S = 40A			1.2	V
Continuous drain - source diode forward current	I _S				50	A
Pulsed drain - source diode forward current	I _{SM}				220	A

Notes:

1. Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production.

Typical Electrical and Thermal Characteristics (Curves)

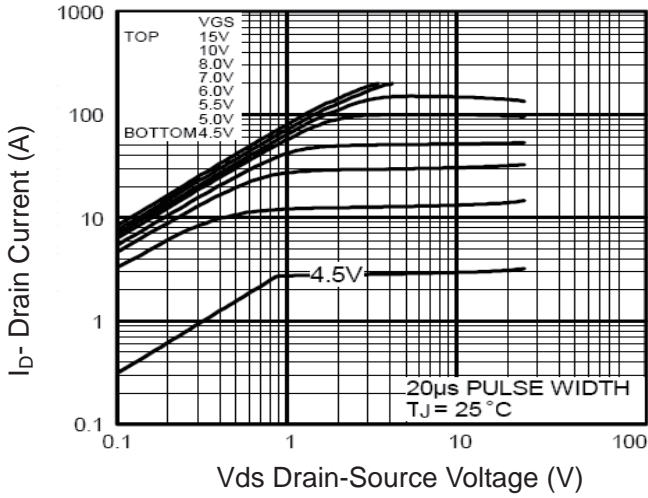


Figure 1 Output Characteristics

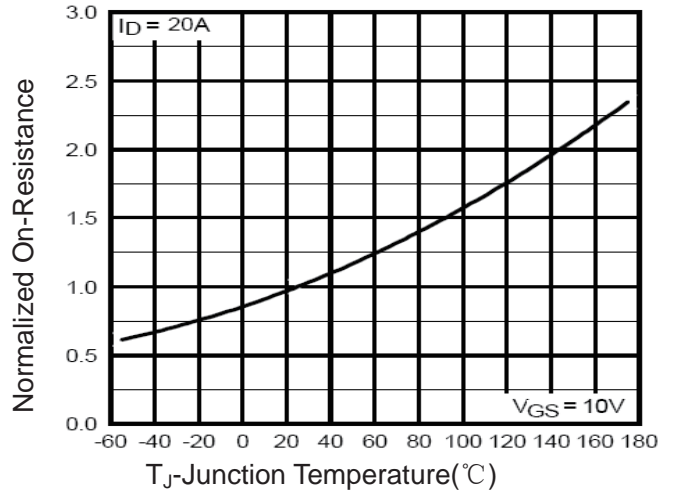


Figure 4 Rdson-Junction Temperature

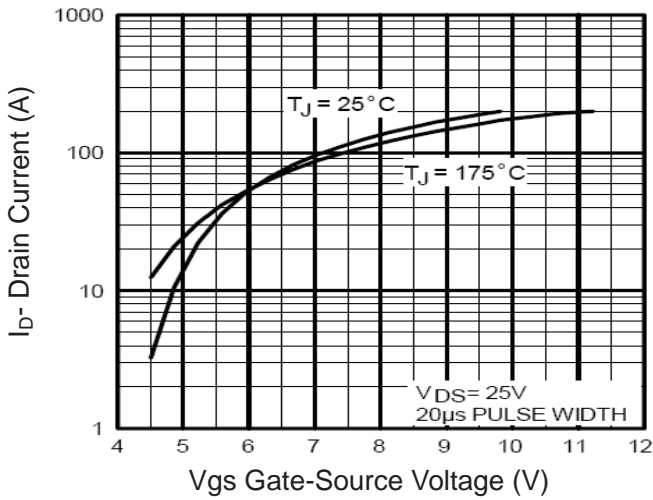


Figure 2 Transfer Characteristics

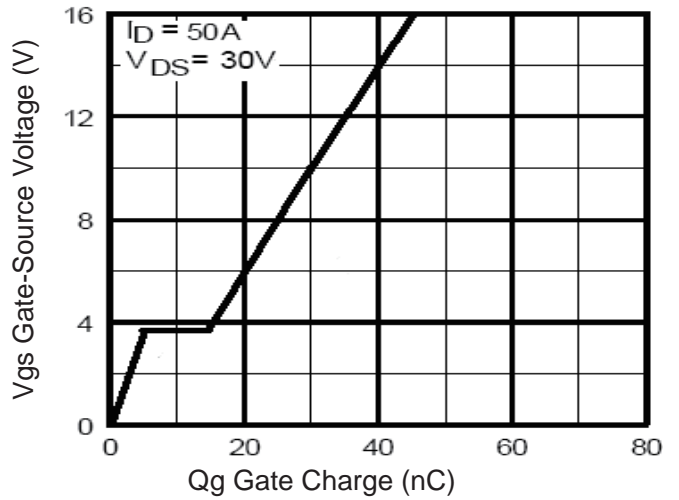


Figure 5 Gate Charge

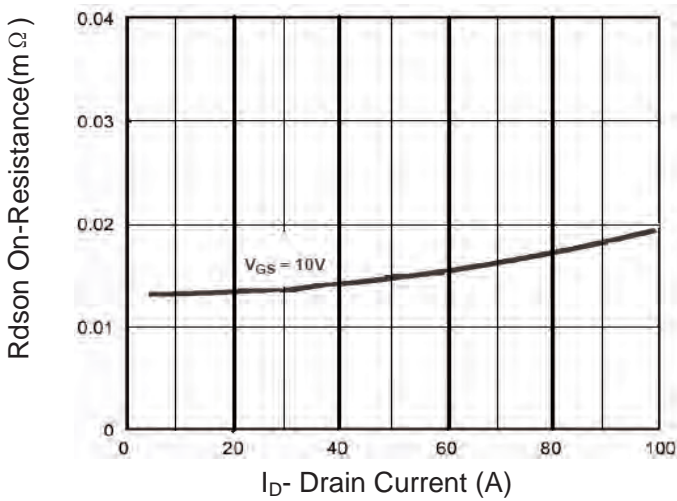


Figure 3 Rdson- Drain Current

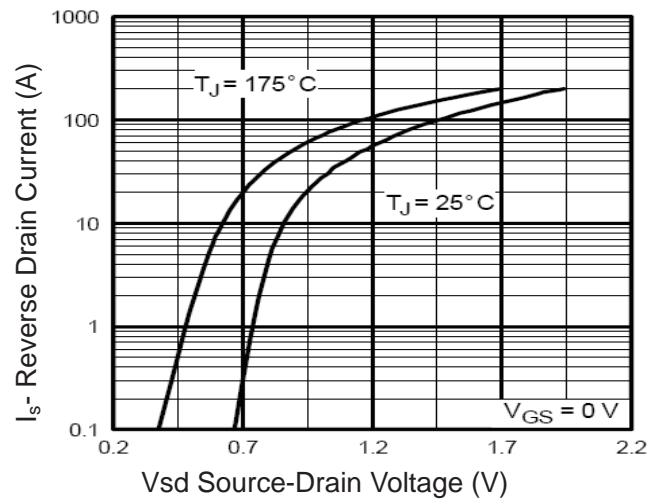


Figure 6 Source- Drain Diode Forward

