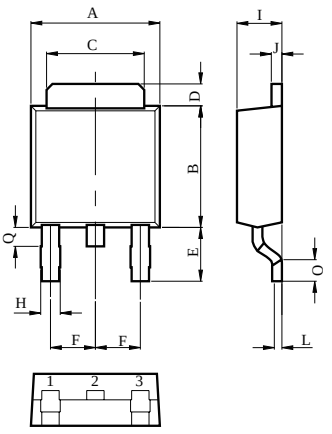
N-Channel Power MOSFET



DIM	MILLIMETERS
A	6 50 ± 0 2
B	5 60 ± 0 2
C	5 20 ± 0 2
D	1 50 ± 0 2
E	2 70 ± 0 2
F	2 30 ± 0 1
H	1 00 MAX
I	2 30 ± 0 2
J	0 5 ± 0 1
L	0 50 ± 0 10
O	1 6 ± 0 2
Q	0 95 MAX

1 GATE
2 DRAIN
3 SOURCE

D-PAK (TO-252)

GENERAL DESCRIPTION

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

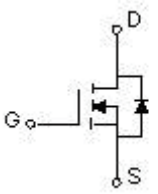
It can be used in awide variety of applications.

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℃ 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}	290	mJ
Power Dissipation Ta=25℃ Minimum Pad of 2- oz Copper	P_D	1.25	W
1 in2 Pad of 2-oz Copper		2.50	
Power Dissipation Tc=25℃		70	
Thermal Resistance from Junction to Case	$R_{\theta Jc}$	1.8	℃/W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	100	
Junction Temperature	T_J	150	℃
Storage Temperature	T_{stg}	- 50 ~ +150	

* Eas condition: L=630μH, Ias=22.7A, Vdd=25V, Rg=25Ω, starting TJ=25℃.

Electrical characteristics (T_a=25℃ 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)

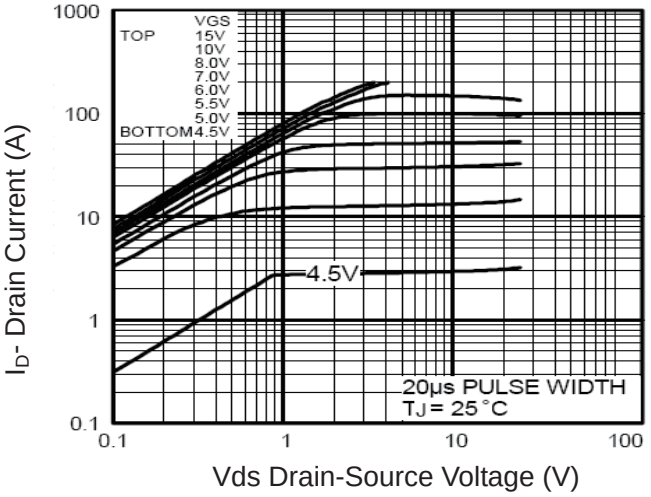


Figure 1 Output Characteristics

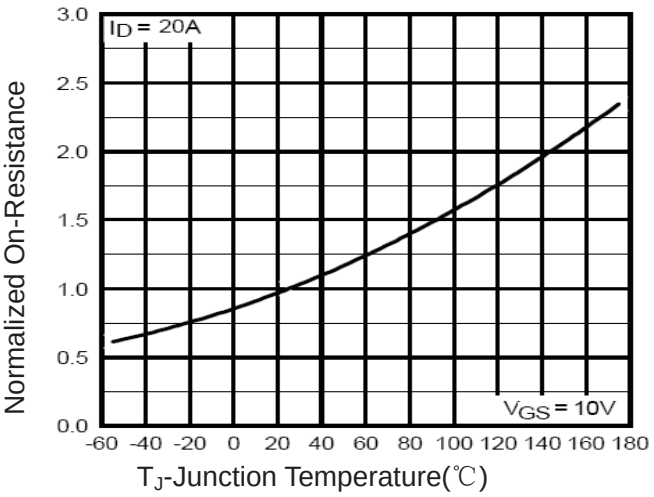


Figure 4 Rdson-Junction Temperature

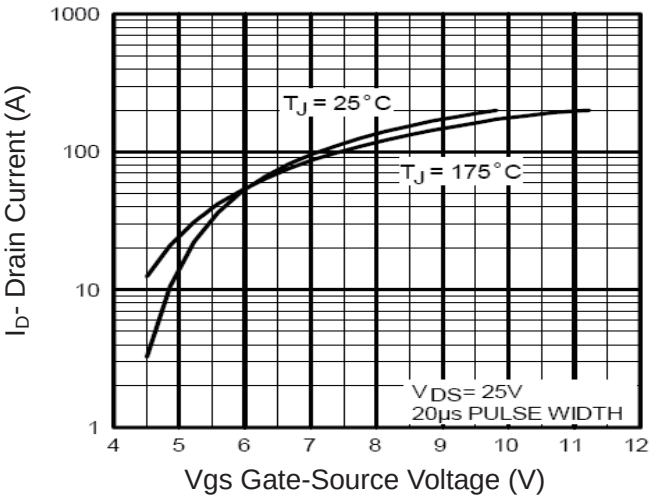


Figure 2 Transfer Characteristics

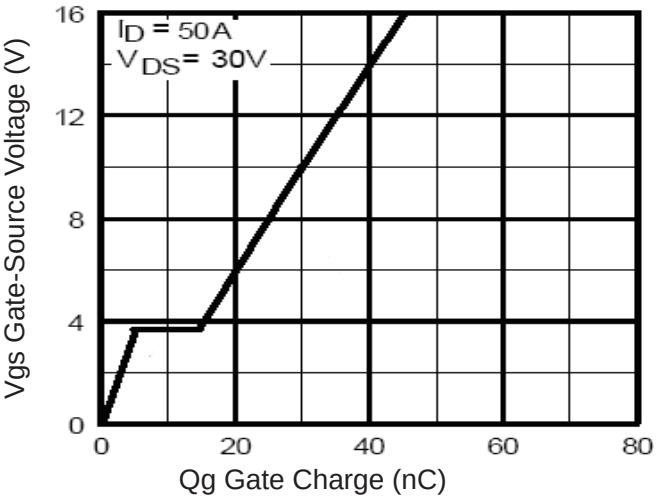


Figure 5 Gate Charge

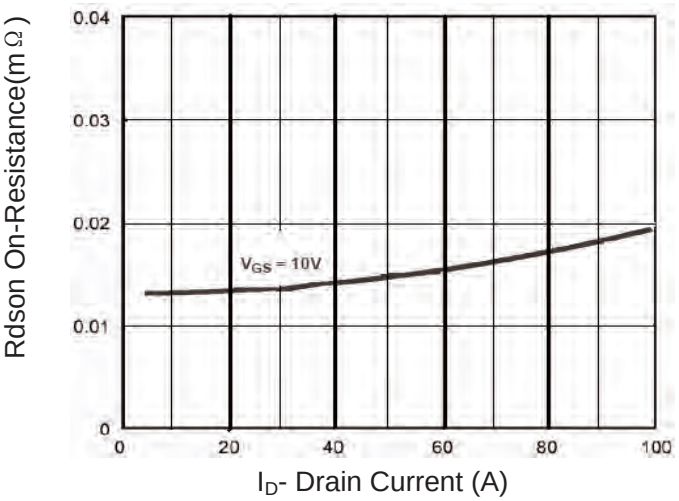


Figure 3 Rdson- Drain Current

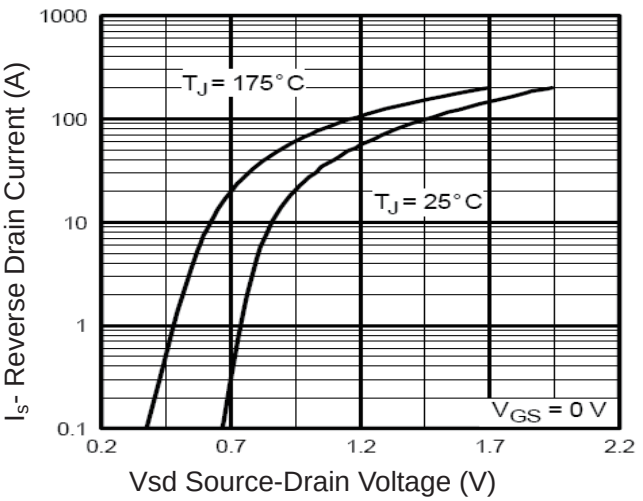


Figure 6 Source- Drain Diode Forward

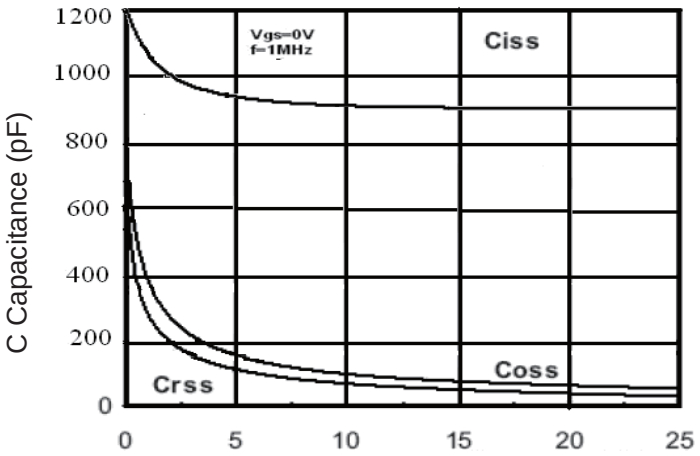


Figure 7 Capacitance vs Vds

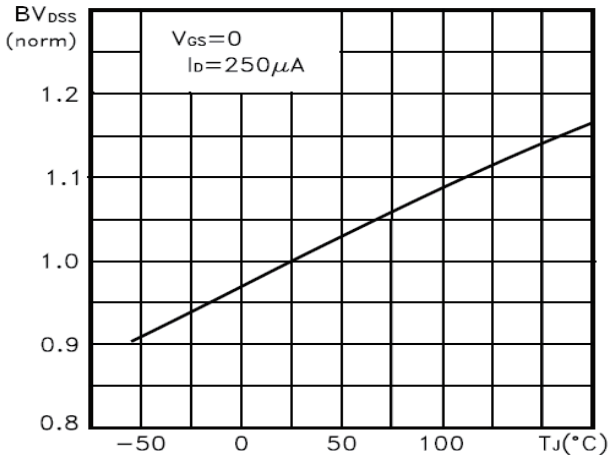


Figure 9 BV_{DSS} vs Junction Temperature

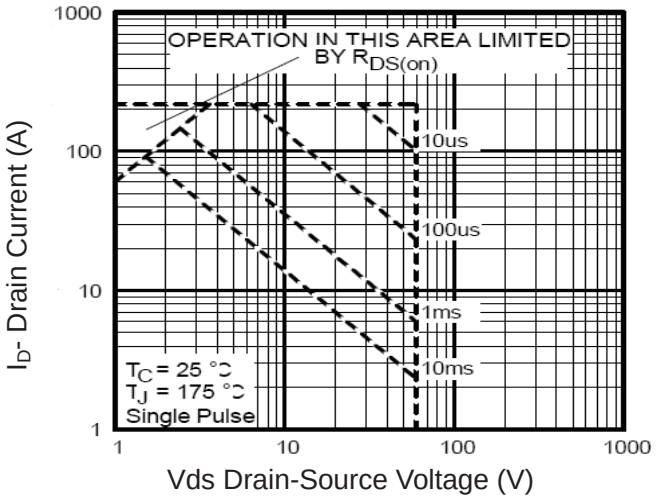


Figure 8 Safe Operation Area

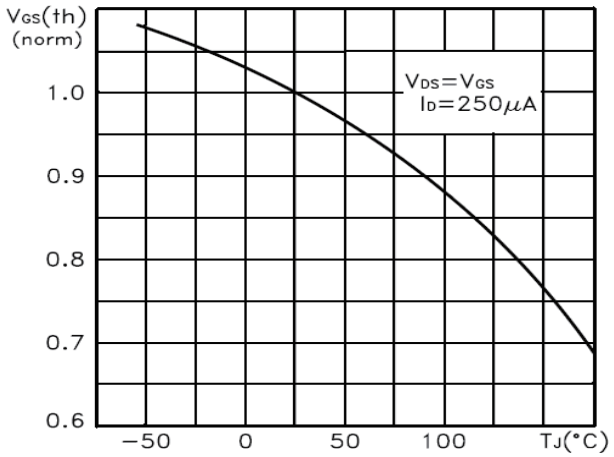


Figure 10 $V_{GS(th)}$ vs Junction Temperature

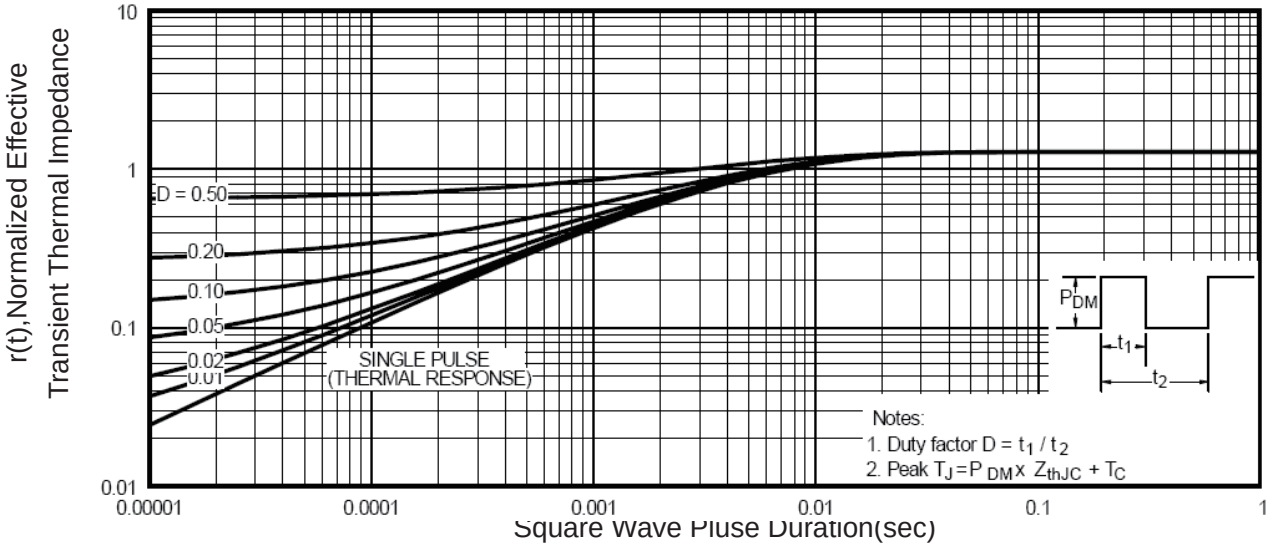


Figure 11 Normalized Maximum Transient Thermal Impedance