

FTK55P30D P-Channel Power MOSFET

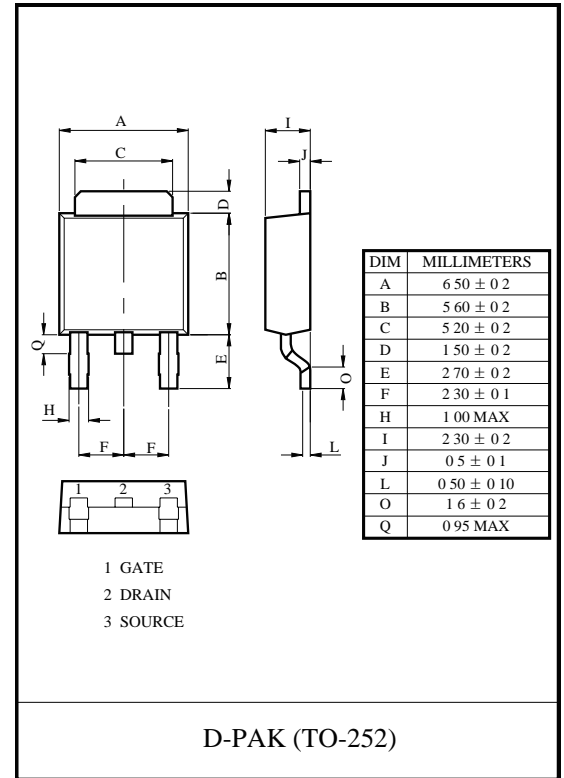
DESCRIPTION

The FTK55P30D uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge.

This device is well suited for high current load applications.

FEATURES

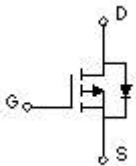
- High density cell design for ultra low $R_{DS(ON)}$
- Fully characterized Avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
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APPLICATIONS

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible Power Supply

EQUIVALENT CIRCUIT



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

Parameter	Symbol	Limit	Unit
Drain- Source Voltage	V_{DS}	- 55	V
Gate- Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	- 30	A
Pulsed Drain Current	I_{DM}	- 120	A
Single Pulsed Avalanche Energy	$E_{AS}^{(1)}$	225	mJ
Power Dissipation	P_D	1.25	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	100	$^\circ\text{C}/\text{W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	- 55 ~ +150	$^\circ\text{C}$
Lead Temperature for Soldering Purposes(1/8" from case for 10s)	T_L	260	$^\circ\text{C}$

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



FTK55P30D

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

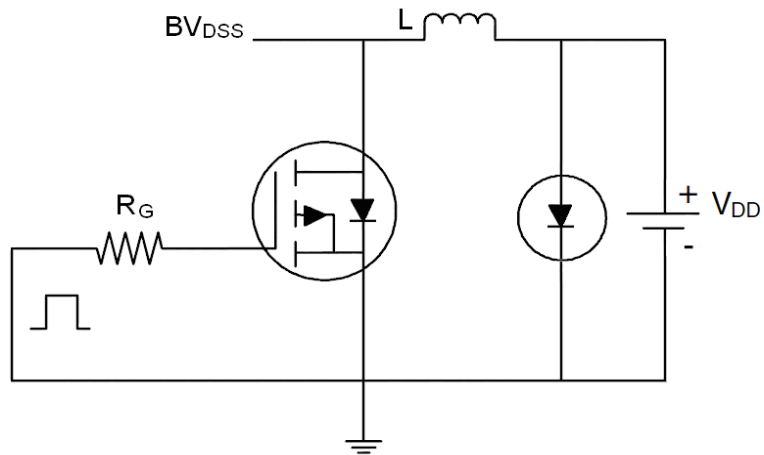
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D = -250μA	-55			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = -55V, V _{GS} = 0V			-1	μA
Gate-body leakage current	I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V			±100	nA
On characteristics (note1)						
Gate - threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-2.0		-4	V
Static drain-source on-state resistance	R _{DS(on)}	V _{GS} = -10V, I _D = -15A			40	mΩ
Forward transconductance	g _{FS}	V _{DS} = -25V, I _D = -16A	8			S
Dynamic characteristics (note 2)						
Input capacitance	C _{iss}	V _{DS} = -30V, V _{GS} = 0V, f = 1MHz		3500		pF
Output capacitance	C _{oss}			240		
Reverse transfer capacitance	C _{rss}			153		
Switching characteristics (note 2)						
Total gate charge	Q _g	V _{DS} = -30V, V _{GS} = -10V, I _D = -15A		56		nC
Gate-source charge	Q _{gs}			11		
Gate-drain charge	Q _{gd}			24		
Turn-on delay time	t _{d(on)}	V _{DD} = -30V, I _D = -15A V _{GS} = -10V, R _G = 3Ω,		12		ns
Turn-on rise time	t _r			15		
Turn-off delay time	t _{d(off)}			38		
Turn-off fall time	t _f			15		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage(note1)	V _{SD}	V _{GS} = 0V, I _S = -24A			-1.2	V
Continuous drain-source diode forward current (note3)	I _S				-30	A
Pulsed drain-source diode forward current	I _{SM}				-120	A

Notes:

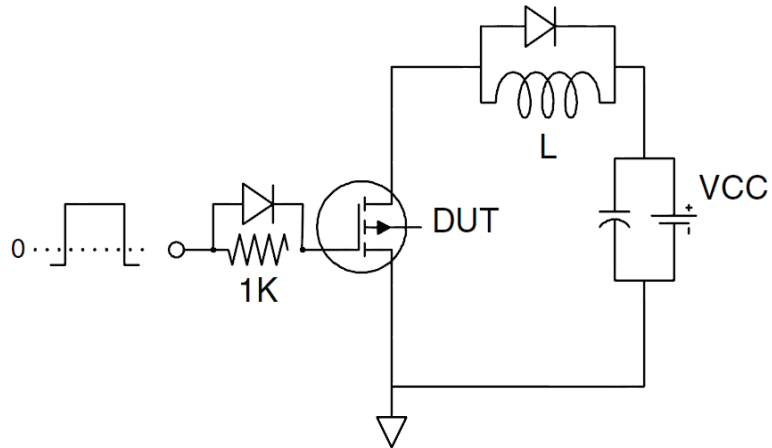
1. Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production.
3. Surface Mounted on FR4 Board, ≤ 10 sec.

Test Circuit

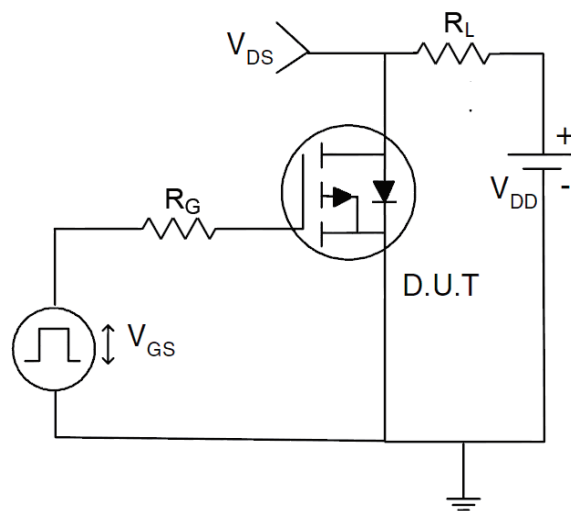
1) E_{AS} Test Circuit



2) Gate Charge Test Circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (curves)

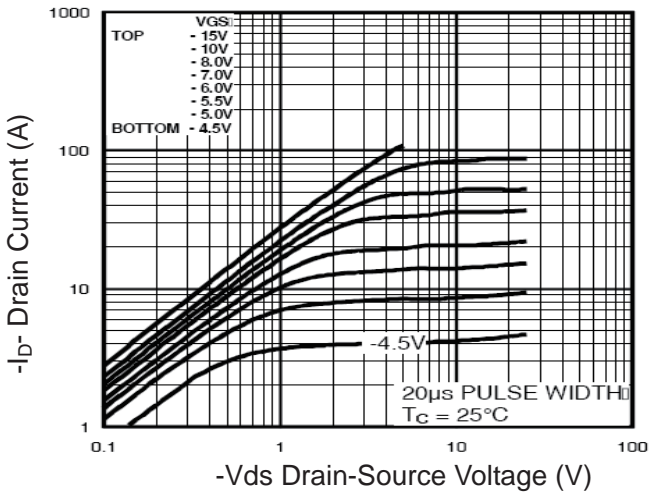


Figure 1 Output Characteristics

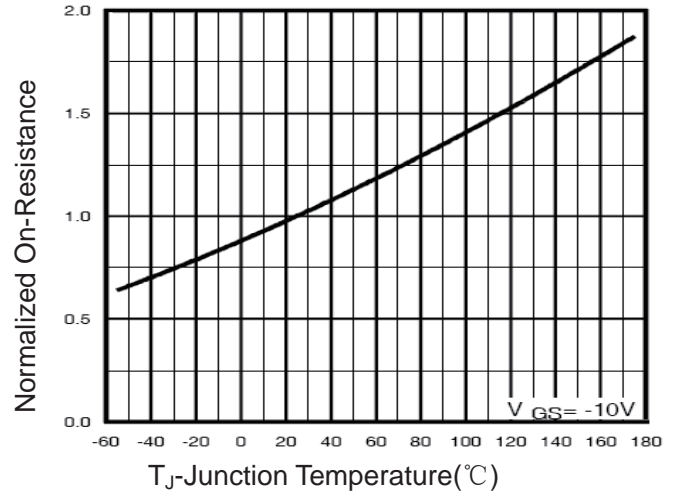


Figure 4 Rdson-Junction Temperature

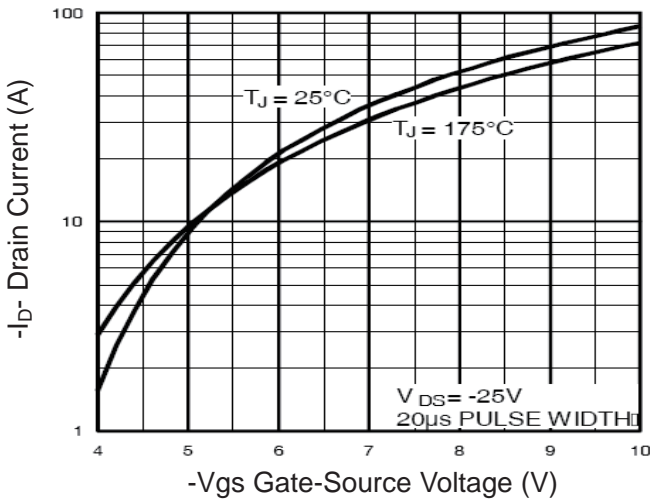


Figure 2 Transfer Characteristics

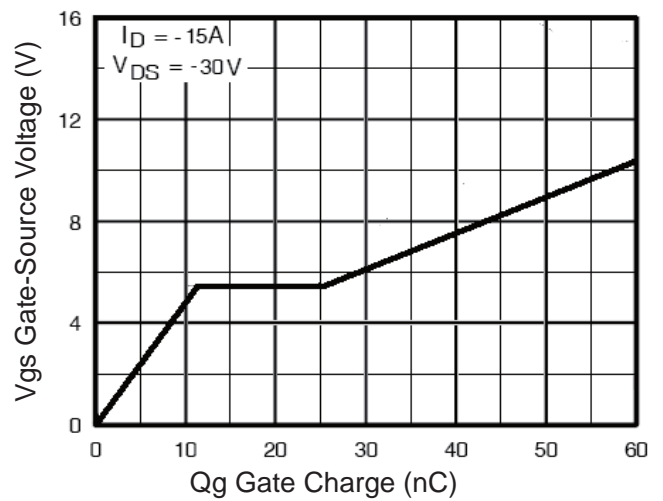


Figure 5 Gate Charge

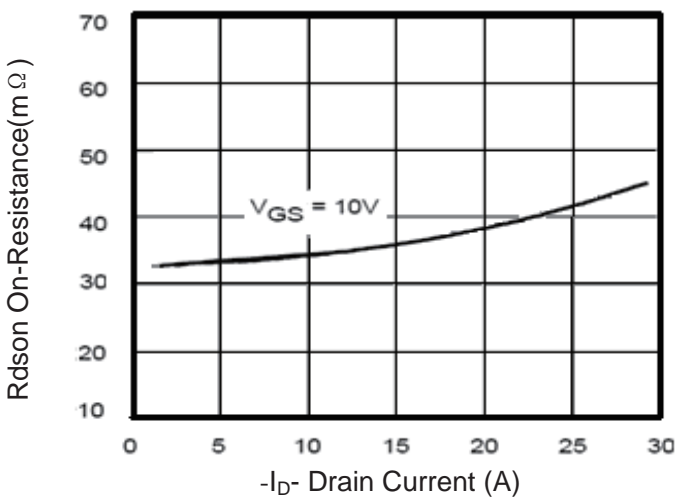


Figure 3 Rdson- Drain Current

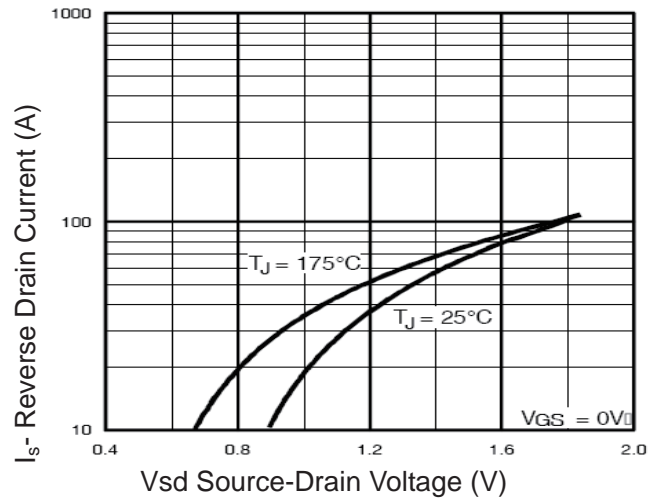


Figure 6 Source- Drain Diode Forward

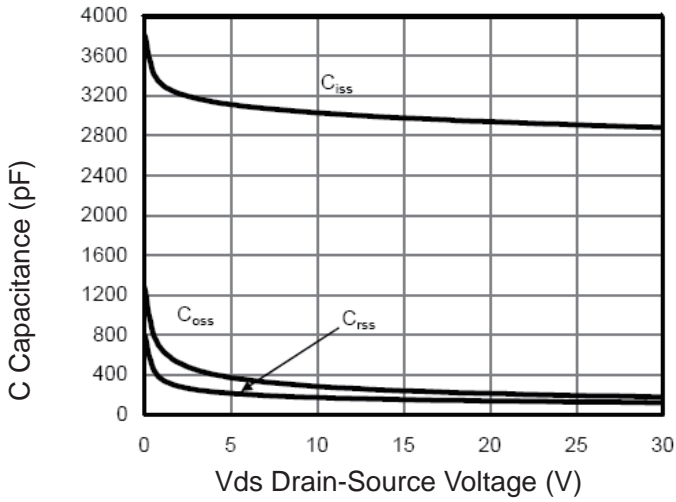


Figure 7 Capacitance vs Vds

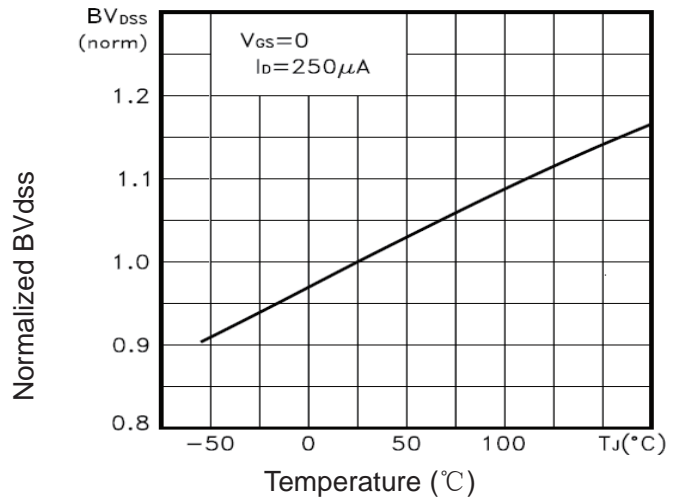


Figure 9 BV_{DSS} vs Junction Temperature

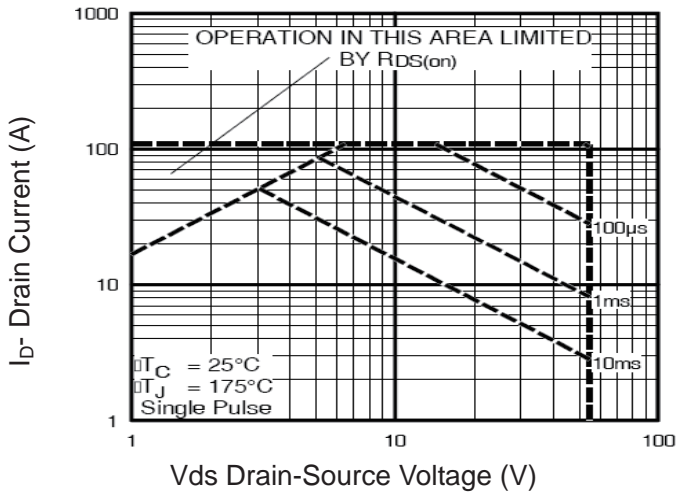


Figure 8 Safe Operation Area

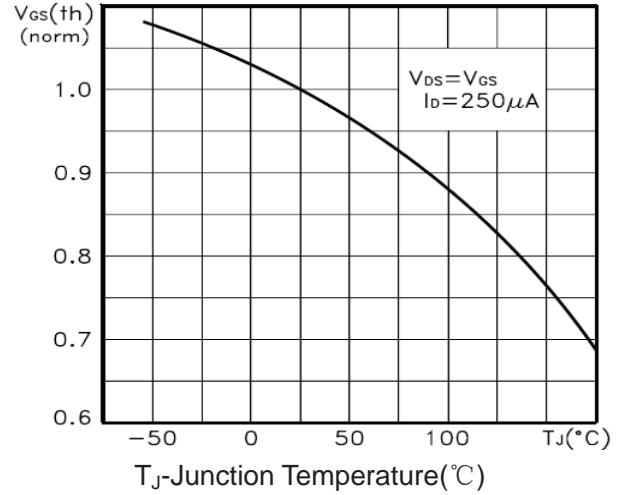


Figure 10 V_{GS(th)} vs Junction Temperature

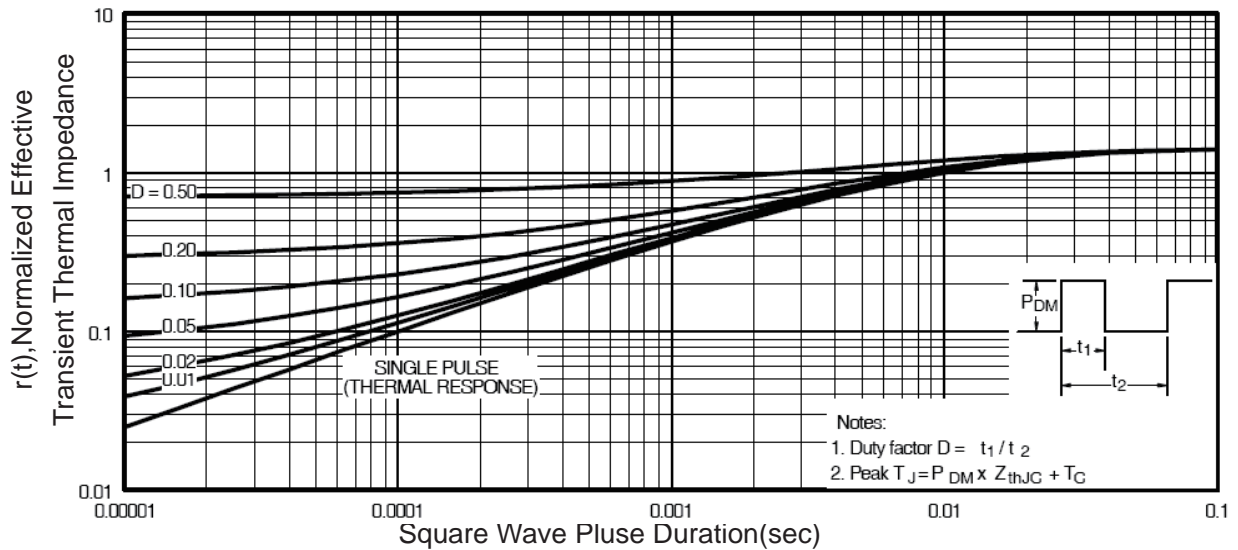


Figure 11 Normalized Maximum Transient Thermal Impedance