UP70P06

P-Channel Enhancement Mode MOSFET

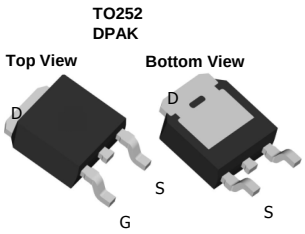
Features

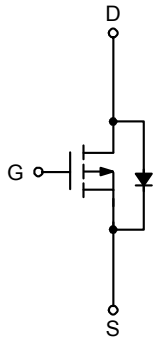
- -60V/-70 A,
  $R_{DS(ON)}$= 7.2mΩ(max.) @ V_{GS}=-10V
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)
- 100% UIS Tested

Applications

- Power Management in Desktop Computer or DC/ DC Converters

Pin Description





P-Channel MOSFET

Absolute Maximum Ratings (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
Common Ratings				
V_{DSS}	Drain-Source Voltage		-60	V
V_{GSS}	Gate-Source Voltage		±25	
T_J	Maximum Junction Temperature		150	°C
T_{STG}	Storage Temperature Range		-55 to 150	
I_S	Diode Continuous Forward Current	T_C=25°C	-70	A
I_D	Continuous Drain Current	T_C=25°C	-70	
		T_C=100°C	-43	
I_{DM}	Pulsed Drain Current	T_C=25°C	-90*	
P_D	Maximum Power Dissipation	T_C=25°C	62.5	W
		T_C=100°C	25	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	Steady State	2	°C/W
I_D	Continuous Drain Current	T_A=25°C	-21.5	A
		T_A=70°C	-17.2	
P_D	Maximum Power Dissipation	T_A=25°C	6.25	W
		T_A=70°C	4	
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	t ≤ 10s	20	°C/W
		Steady State	55	
I_{AS} [a]	Avalanche Current, Single pulse	L=0.5mH	24	A
E_{AS} [a]	Avalanche Energy, Single pulse	L=0.5mH	344	mJ

Note * Current limited by bond wire.

Note a UIS tested and pulse width are limited by maximum junction temperature 150°C (initial temperature T_J = 25°C).

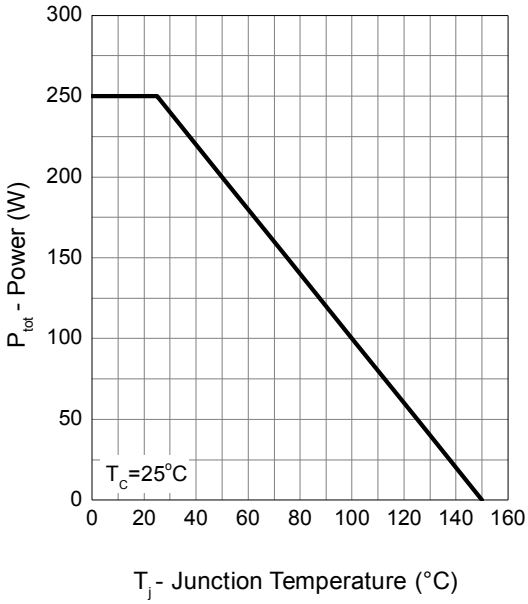
Electrical Characteristics (T_A = 25°C Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=-250μA	-60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-48V, V_{GS}=0V	-	-	1	μA
		T_J=85°C	-	-	-30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=-250μA	-1	-2	-3	V
I_{GSS}	Gate Leakage Current	V_{GS}=±25V, V_{DS}=0V	-	-	±100	nA
$R_{DS(ON)}$ [b]	Drain-Source On-state Resistance	V_{GS}=-10V, I_{DS}=-20A	-	5.6	7.2	mΩ
Diode Characteristics						
V_{SD} [b]	Diode Forward Voltage	I_{SD}=-1A, V_{GS}=0V	-	-0.7	-1	V
t_{rr}	Reverse Recovery Time	I_{SD}=-20A, dI_{SD}/dt=100A/μs	-	51	-	ns
Q_{rr}	Reverse Recovery Charge		-	90	-	nC
Dynamic Characteristics [c]						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz	-	3	-	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-30V, Frequency=1.0MHz	-	6095	-	pF
C_{oss}	Output Capacitance		-	1080	-	
C_{rss}	Reverse Transfer Capacitance		-	430	-	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=-30V, R_L=30Ω, I_{DS}=-1A, V_{GEN}=-10V, R_G=6Ω	-	18	33	ns
t_r	Turn-on Rise Time		-	20	36	
$t_{d(OFF)}$	Turn-off Delay Time		-	200	360	
t_f	Turn-off Fall Time		-	120	216	
Gate Charge Characteristics [c]						
Q_g	Total Gate Charge	V_{DS}=-30V, V_{GS}=-10V, I_{DS}=-20A	-	136	-	nC
Q_{gs}	Gate-Source Charge		-	20	-	
Q_{gd}	Gate-Drain Charge		-	33	-	

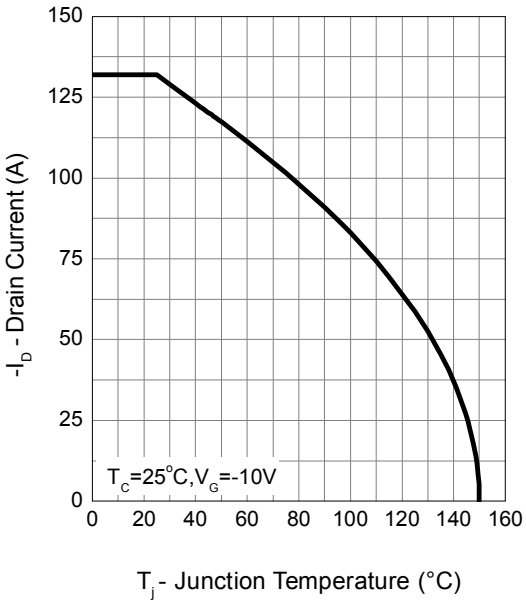
Note b：Pulse test; pulse width≤300μs, duty cycle≤2%.
Note c：Guaranteed by design, not subject to production testing.

Typical Operating Characteristics

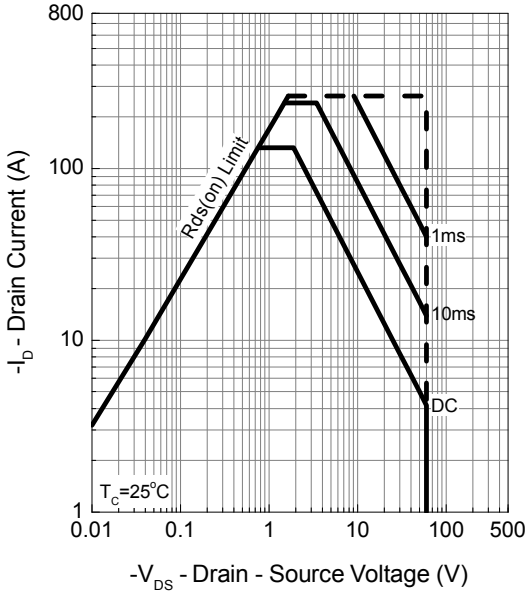
Power Dissipation



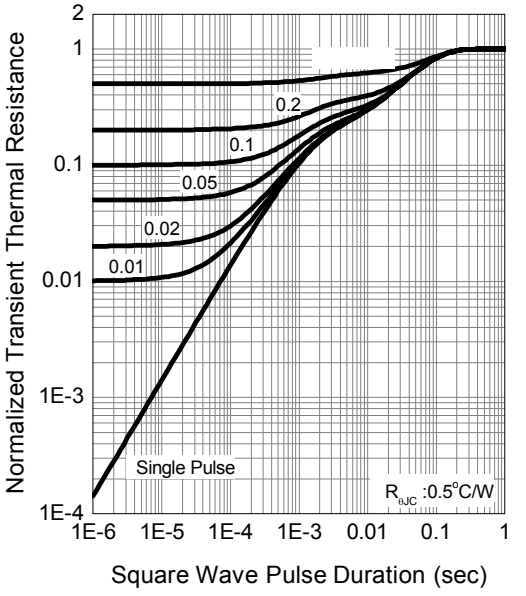
Drain Current



Safe Operation Area

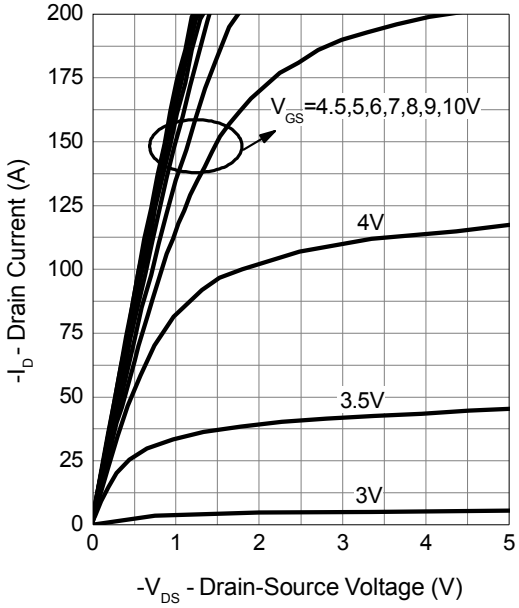


Thermal Transient Impedance

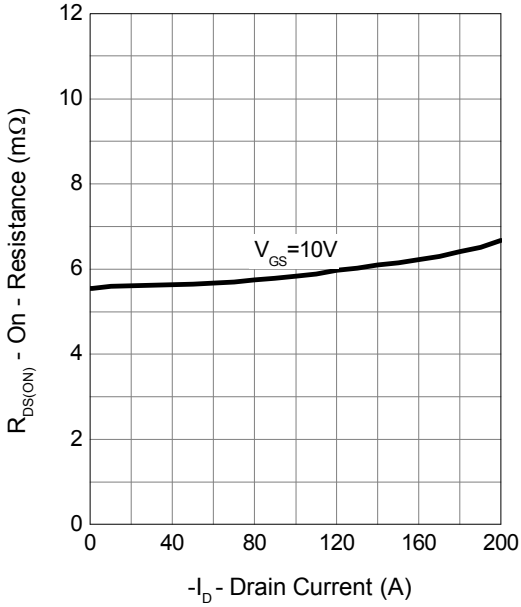


Typical Operating Characteristics (Cont.)

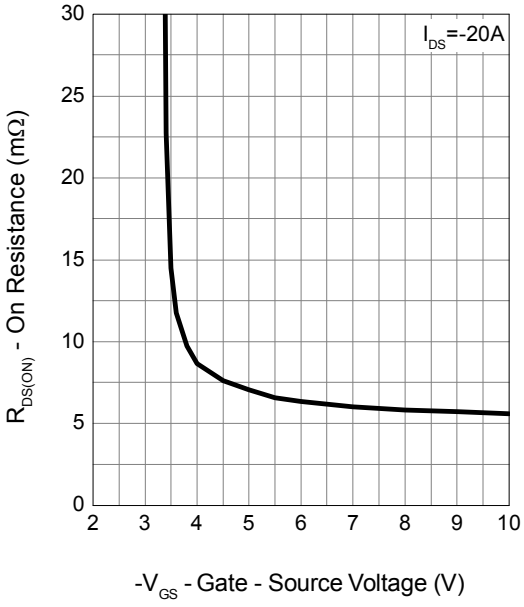
Output Characteristics



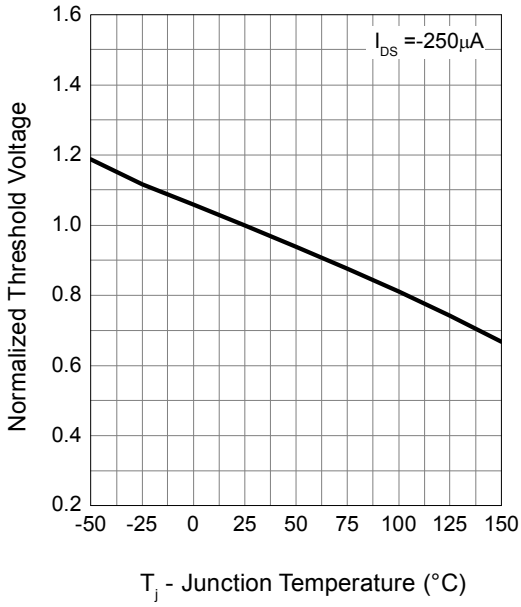
Drain-Source On Resistance



Gate-Source On Resistance

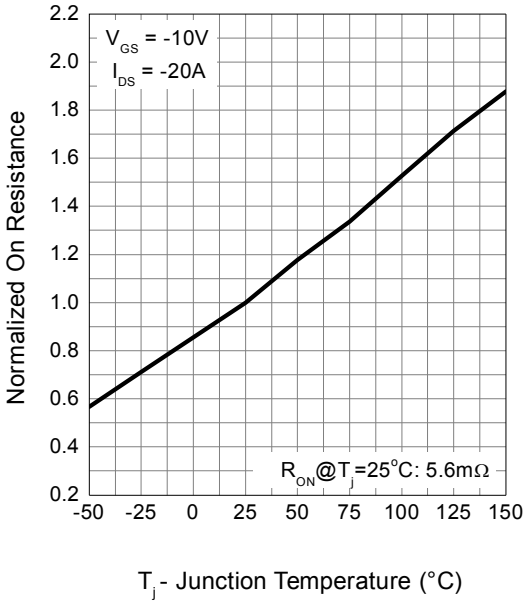


Gate Threshold Voltage

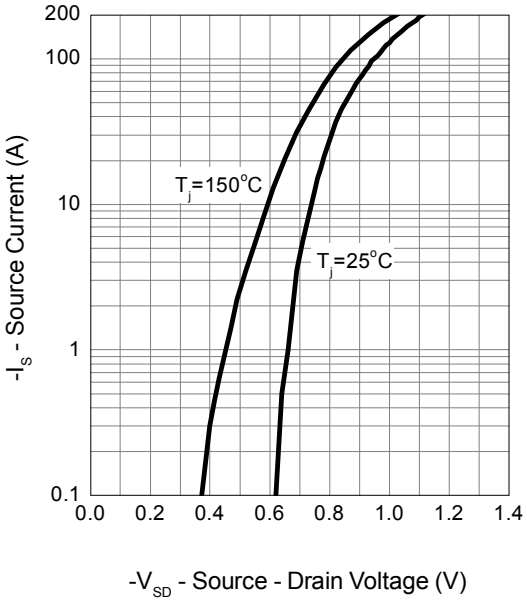


Typical Operating Characteristics (Cont.)

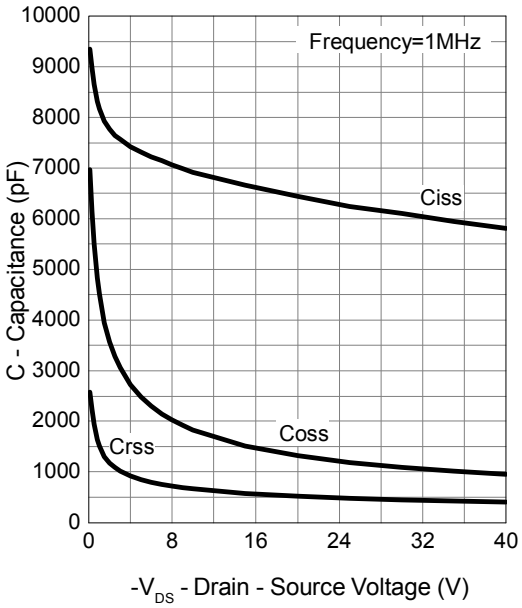
Drain-Source On Resistance



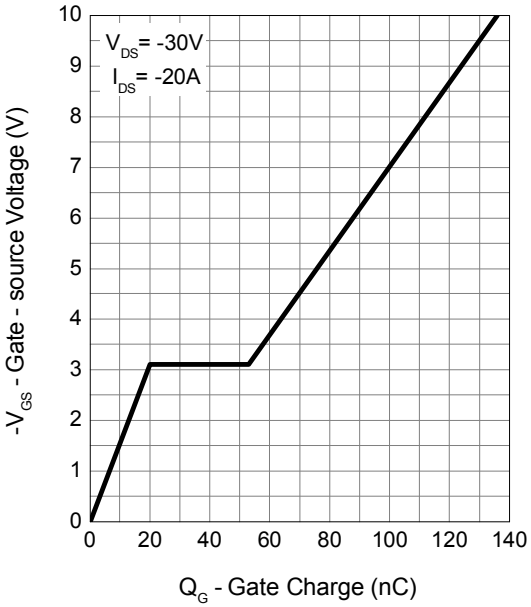
Source-Drain Diode Forward



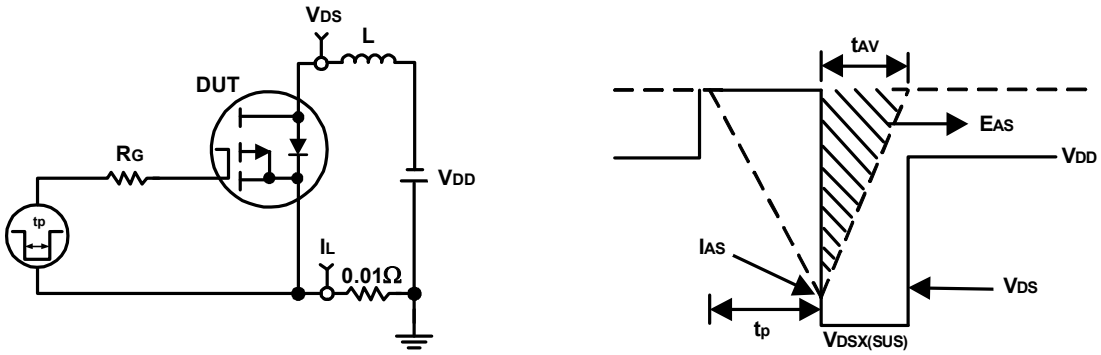
Capacitance



Gate Charge



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms