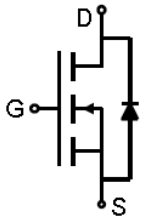
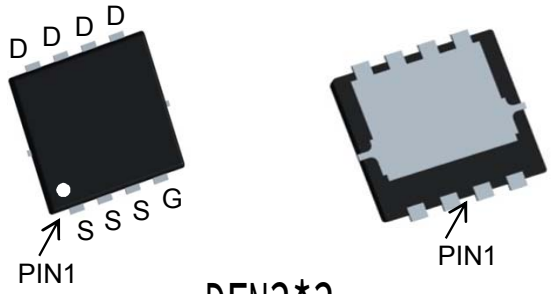
N-channel Enhancement Mode MOSFET 3075 DATASHEET

DESCRIPTION

The 3075 uses advanced trench technology to provide excellent RDS(ON) and low gate charge. This device is suitable for use as a load switch or in PWM applications.



Schematic diagram



DFN3*3

GENERAL FEATURES

- RDS(ON) < 8mΩ @ VGS=4.5V
  RDS(ON) < 5mΩ @ VGS=10V
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

- PWM applications
- Load switch
- Power management

■ **Absolute Maximum Ratings** (T_A=25℃unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-source Voltage		V_{DS}	30	V
Gate-source Voltage		V_{GS}	±20	V
Drain Current	T_C=25℃	I_D	30	A
	T_C=100℃		21	
Pulsed Drain Current [A]		I_{DM}	120	A
Total Power Dissipation	T_C=25℃	P_D	35	W
	T_C=100℃		15	W
Single Pulse Avalanche Energy [B]		E_{AS}	29	mJ
Thermal Resistance Junction-to-Case [C]		$R_{\theta JC}$	3.4	℃/ W
Junction and Storage Temperature Range		T_J ,T_{STG}	-55～+150	℃

ELECTRICAL CHARACTERISTICS (T_A=25℃unless otherwise noted)

Parameter	Symbol	Conditions		Min	Typ	Max	Units
Static Parameter		0V,V					
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D=250μA		30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=24V,V_{GS}=0V	T_J=25℃			1	μA
			T_J=55℃			10	
Gate-Body Leakage Current	I_{GSS}	V_{GS}= ±20V, V_{DS}=0V				±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D=250μA		1.2	1.5	2.2	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}= 10V, I_D=15A			4.1	5.0	mΩ
		V_{GS}= 4.5V, I_D=15A			6.5	8.0	
Diode Forward Voltage	V_{SD}	I_S=1 A,V_{GS}=0V			0.7	1.2	V
Maximum Body-Diode Continuous Current	I_S					30	A
Dynamic Parameters							
Input Capacitance	C_{iss}	V_{DS}=15V,V_{GS}=0V,f=1MHZ			990		pF
Output Capacitance	C_{oss}				550		
Reverse Transfer Capacitance	C_{rss}				60		
Switching Parameters							
Total Gate Charge	Q_g	V_{GS}=10V,V_{DS}=15V,I_D=20A			14.7		nC
Gate-Source Charge	Q_{gs}				2.2		
Gate-Drain Charge	Q_{gd}				3.1		
Reverse Recovery Chrage	Q_{rr}	IS=20A,VGS=0V,dis/dt=100A/uS			25		
Reverse Recovery Time	t_{rr}				26		ns
Turn-on Delay Time	$t_{D(on)}$	VDS=15V,ID=15A,RG=3.0Ω VGS=10V			TBC		
Turn-on Rise Time	t_r				TBC		
Turn-off Delay Time	$t_{D(off)}$				TBC		
Turn-off fall Time	t_f				TBC		

A. Pulse Test: Pulse Width≤300us,Duty cycle ≤2%.

B. T_j=25℃, V_{DD}=20V, V_G=10V, L=0.5mH, R_g=25Ω

C. $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance, where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design, while $R_{\theta JA}$ is determined by the board design. The maximum rating presented here is based on mounting on a 1 in 2 pad of 2oz copper.

■ Typical Performance Characteristics

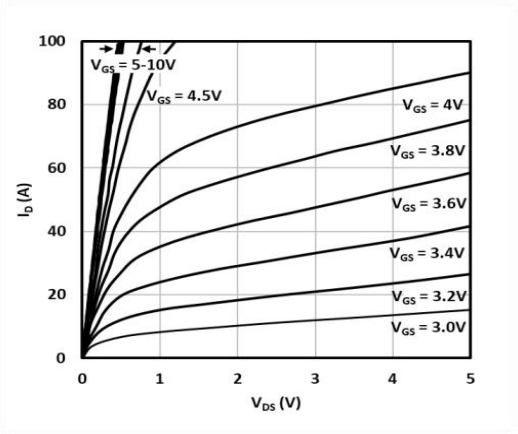


Figure1. Output Characteristics

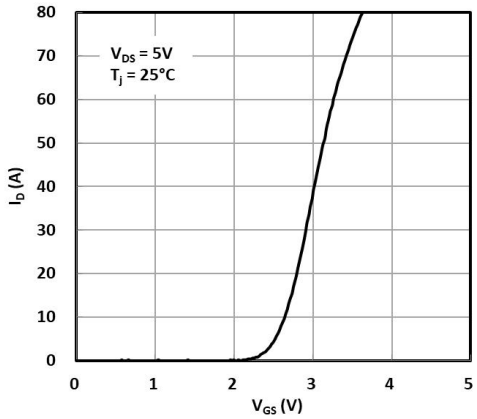
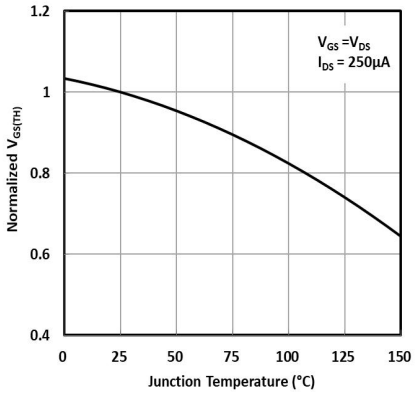
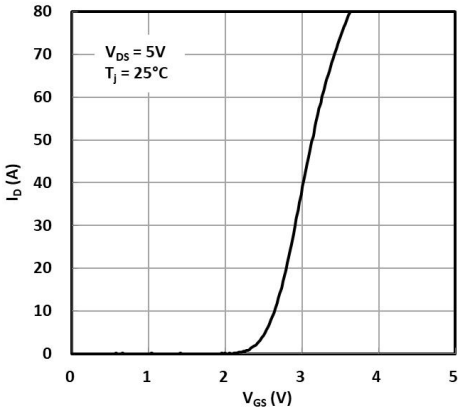


Figure2. Transfer Characteristics



Figur3.Normalized gate threshold voltage vs. temperature



Figur4.On-resistance vs. gate voltage

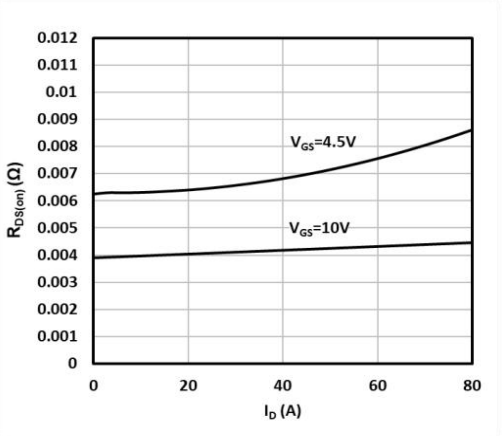


Figure5. Drain-Source on Resistance

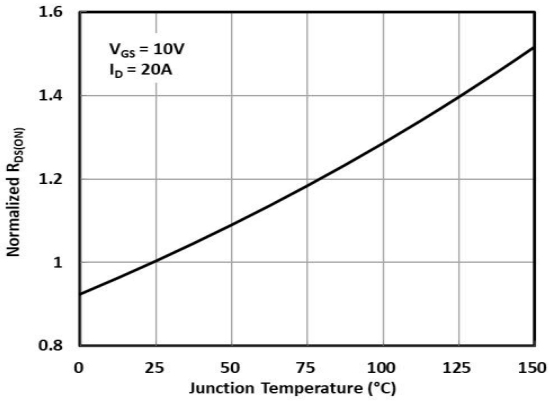
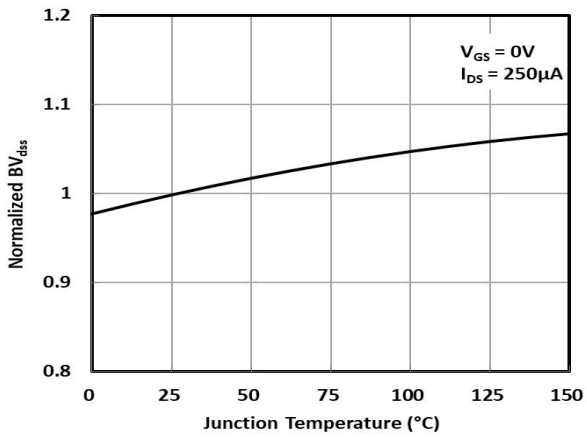
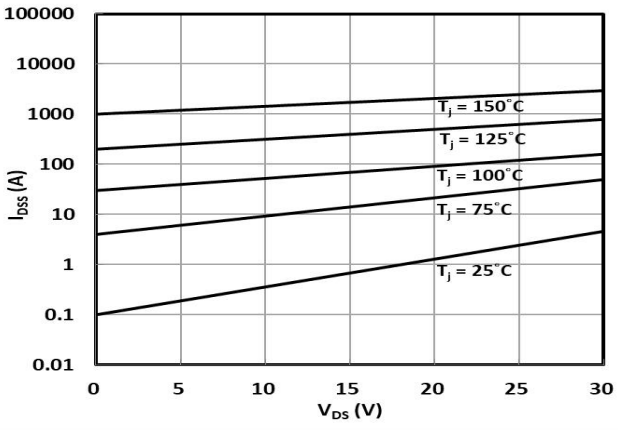


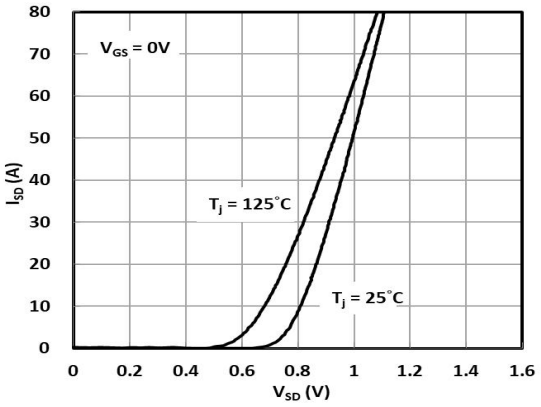
Figure6. Drain-Source on Resistance



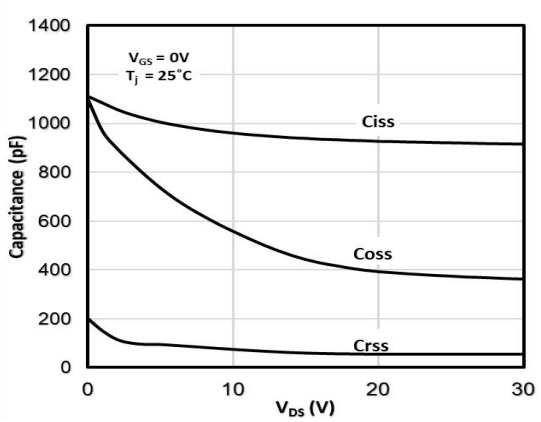
Figur7.Normalized drain-to-source breakdown voltage vs. temperature



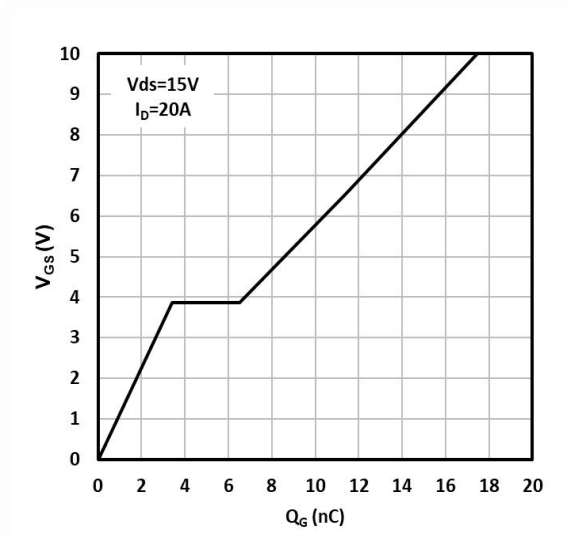
Figur8.Drain-to-source leakage current vs.voltage



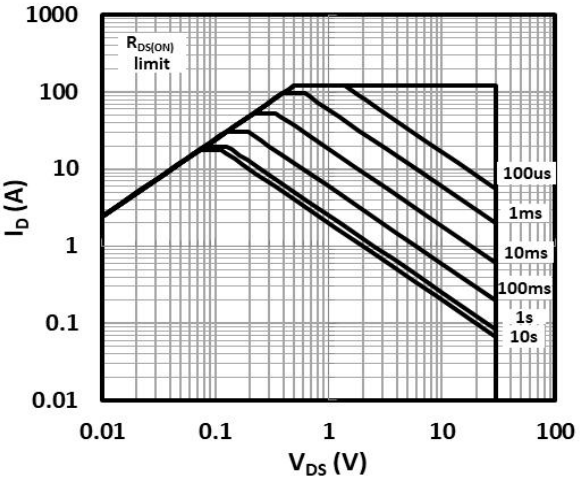
Figur9 Source-to-drain diode forward characteristics



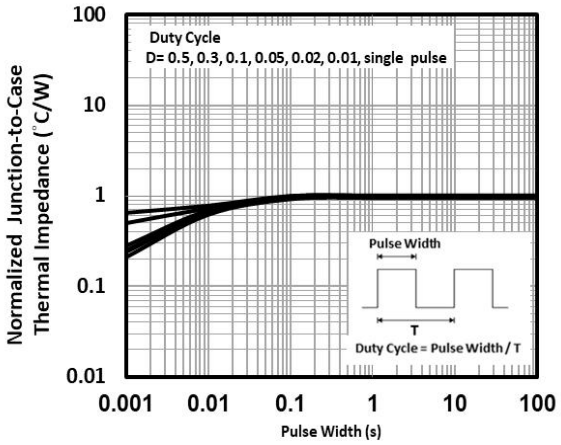
Figur10. Capacitance vs.drain-to-source voltage



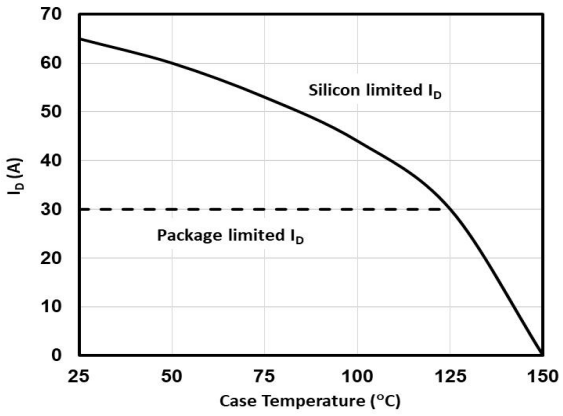
Figur11. Gate-t0-source voltage vs.date charge



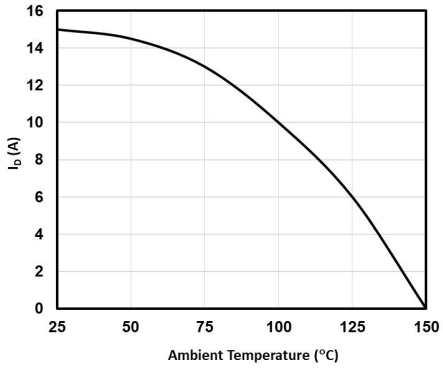
Figur12. Safe operating area



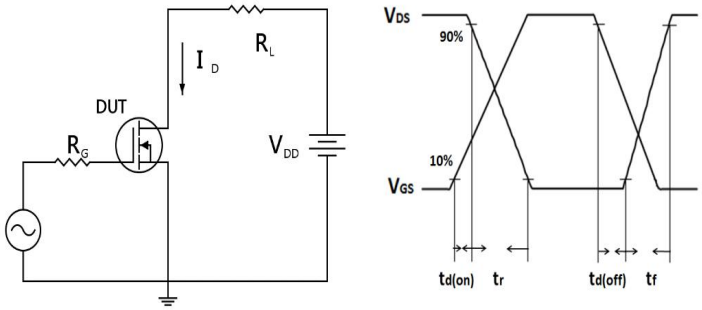
Figur13. Junction-to-case thermal impedance



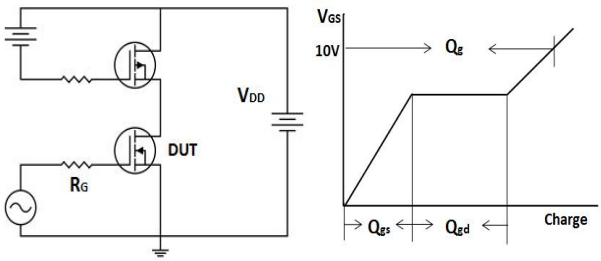
Figur14. Maximum drain current vs .case temperature



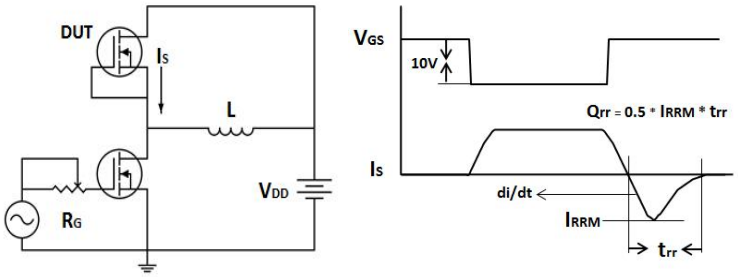
Figur15. Maximum drain current vs .ambient temperature



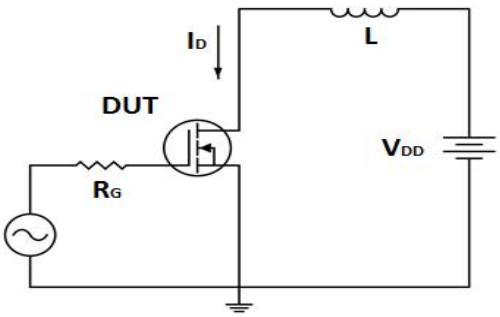
Resistive switching time test circuit&waveforms

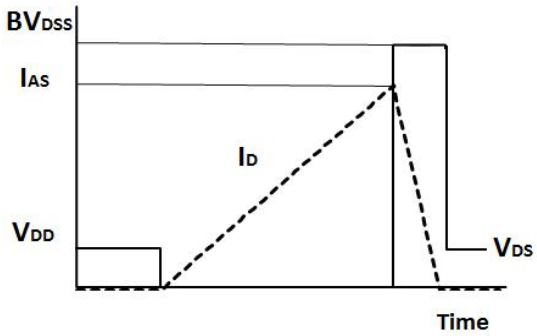


Gate charge test circuit&waveform



Peak diode recovery dv/dt test circuitD& waveforms

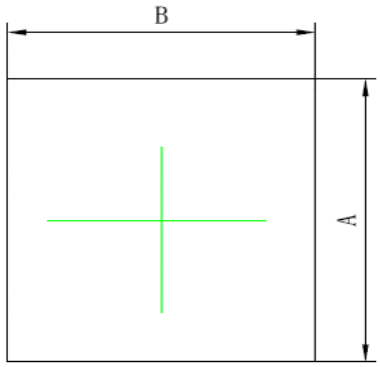


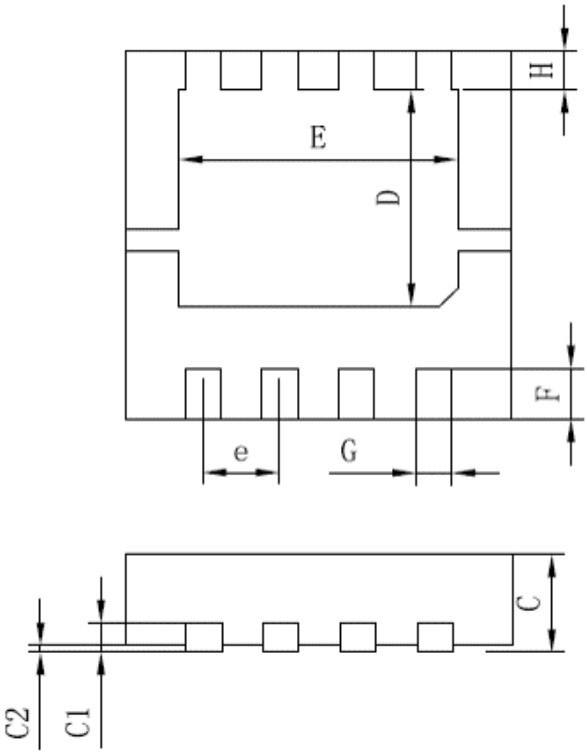


Unclamped inductive switching test circuit & waveforms

Package Information

■ DFN3.3X3.3 Package information





A	B	C	C1
3.25±0.05	3.25±0.05	0.8±0.05	0.2±0.02
C2	D	E	F
0.05Max	1.9±0.1	2.35±0.15	0.45±0.05
G	H	e	
0.3±0.05	0.35±0.05	0.65±0.05	
单位：mm			