DESCRIPTION

The 25N06 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.

GENERAL FEATURES

-

| V_{DSS}	$R_{DS(ON)}$ @ 10V (typ)	I_D
60V	18 m Ω	25 A

- High density cell design for ultra low Rdson
- 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
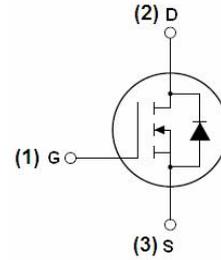
Schematic diagram
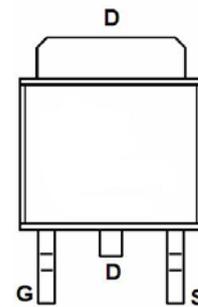
Marking and pin Assignment
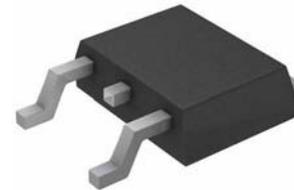
TO-252

Absolute Maximum Ratings (TA=25℃unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	25	A
Drain Current-Continuous(Tc=100℃)	I_D (100℃)	17	A
Pulsed Drain Current	I_{DM}	75	A
Maximum Power Dissipation	P_D	50	W
Derating factor		0.33	W/℃
Single pulse avalanche energy (Note 5)	E_{AS}	110	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 175	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case(Note 2)	$R_{θJC}$	3.0	℃/W

Electrical Characteristics (TA=25℃unless otherwise noted)

| Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1.0	-	3.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=12A	-	18	25	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=4.5A	11	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{Iss}	V_{DS}=30V,V_{GS}=0V, F=1.0MHz	-	1890	-	PF
Output Capacitance	C_{oss}		-	168	-	PF
Reverse Transfer Capacitance	C_{rss}		-	132	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=30V,I_D=2A,R_L=6.7Ω V_{GS}=10V,R_G=3Ω	-	7	-	nS
Turn-on Rise Time	t_r		-	3.2	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	19.2	-	nS
Turn-Off Fall Time	t_f		-	3.2	-	nS
Total Gate Charge	Q_g	V_{DS}=48V,I_D=10A, V_{GS}=10V	-	49		nC
Gate-Source Charge	Q_{gs}		-	8		nC
Gate-Drain Charge	Q_{gd}		-	16		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=10A	-		1.2	V
Diode Forward Current (Note 2)	I_S		-	-	25	A
Reverse Recovery Time	t_{rr}	TJ = 25°C, IF =10A di/dt = 100A/μs(Note3)	-	35	-	nS
Reverse Recovery Charge	Q_{rr}		-	43	-	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2. Surface Mounted on FR4 Board, t ≤ 10 sec.

3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

4. Guaranteed by design, not subject to production

5. EAS condition：Tj=25℃,V_{DD}=30V,V_G=10V,L=0.5mH,Rg=25Ω

Test circuit

1）E$_{AS}$ test Circuits
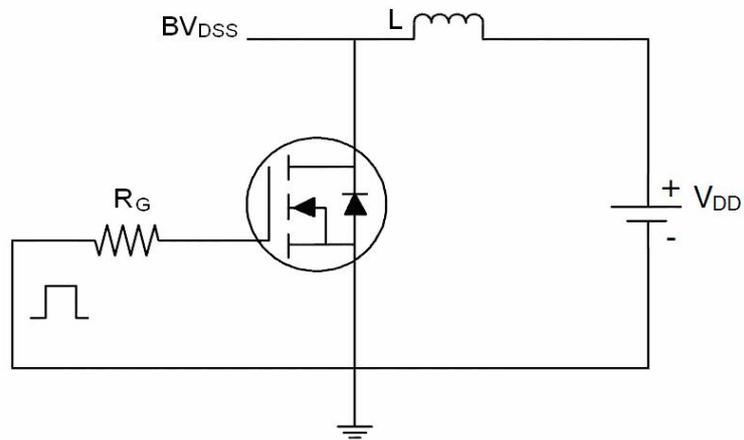
2）Gate charge test Circuit:
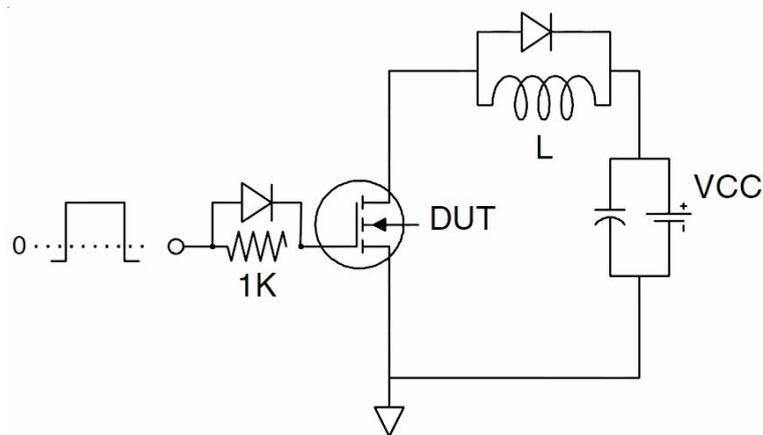
3）Switch Time Test Circuit：
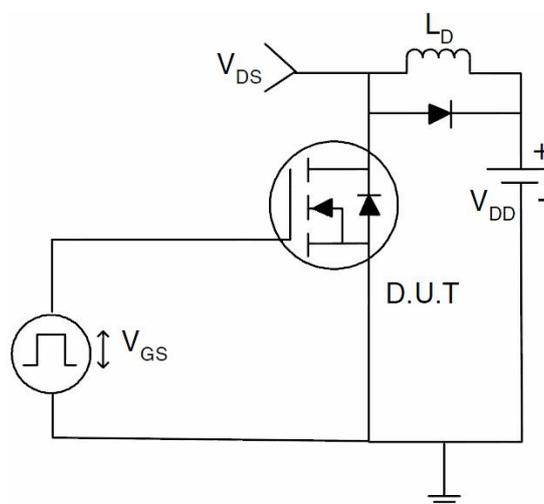
## TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)
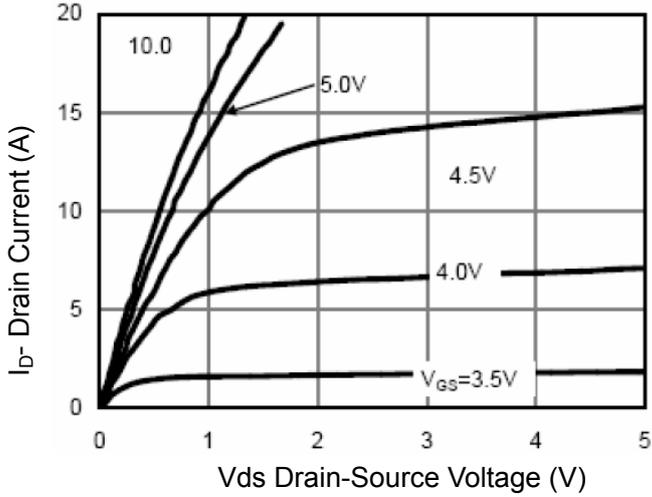
Figure 1 Output Characteristics
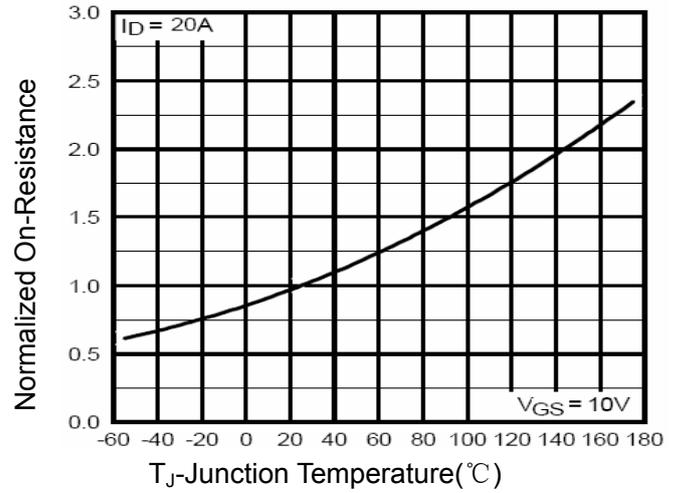
**Figure 4 Rdson-JunctionTemperature**
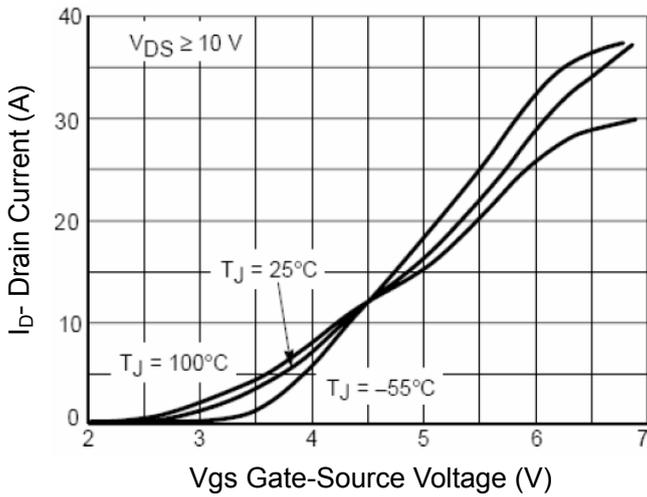
Figure 2 Transfer Characteristics
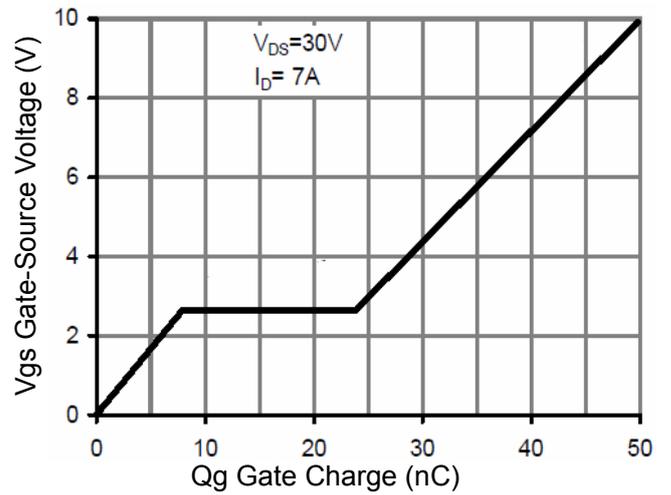
Figure 5 Gate Charge
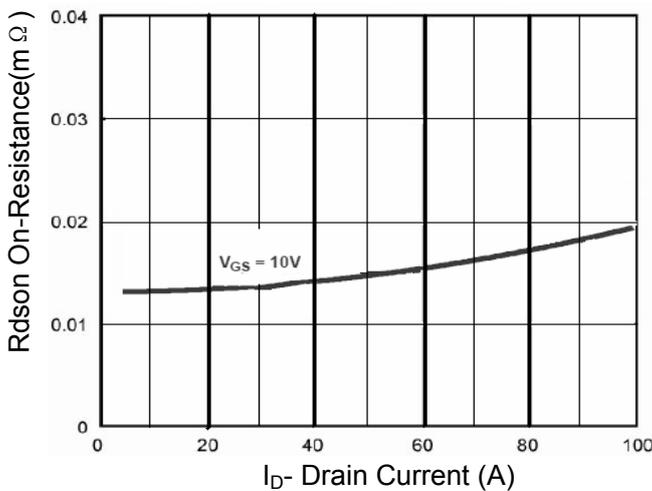
Figure 3 Rdson- Drain Current
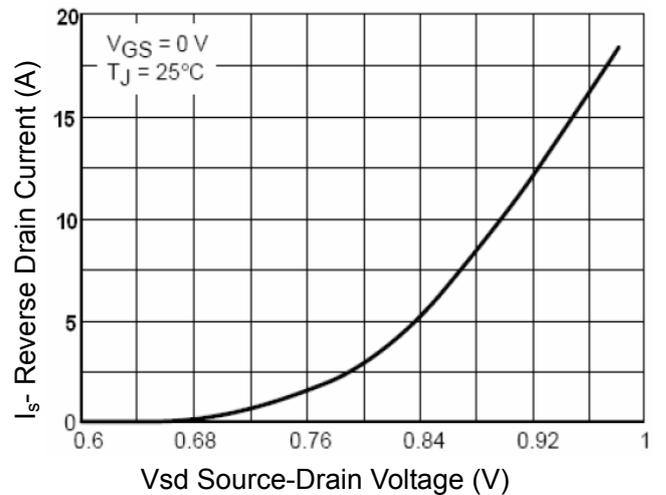
Figure 6 Source- Drain Diode Forward
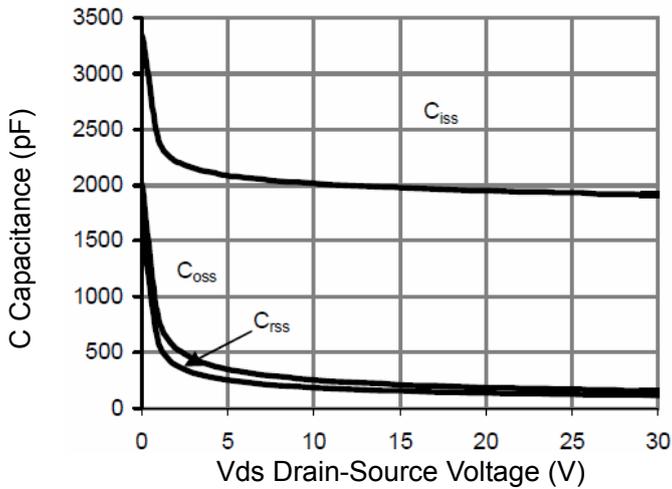
Figure 7 Capacitance vs Vds
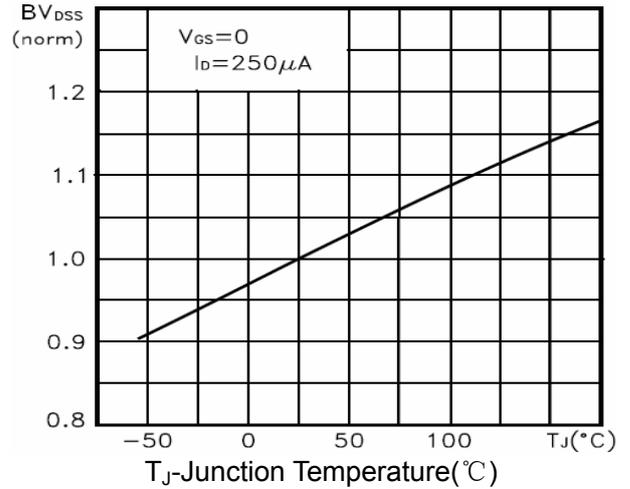
Figure 9   BV$_{DSS}$ vs Junction Temperature
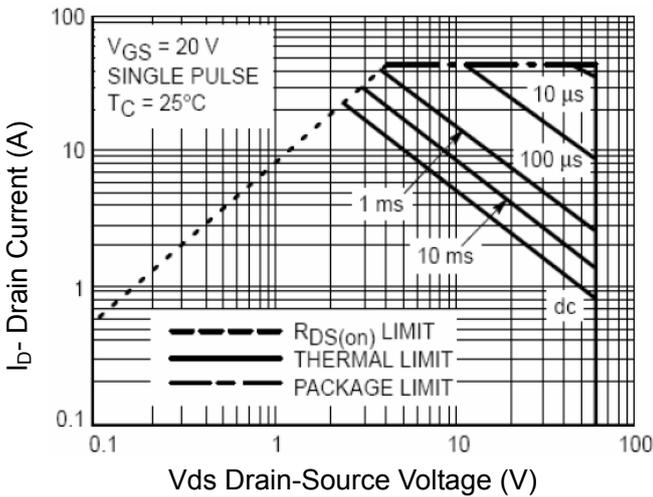
Figure 8   Safe Operation Area
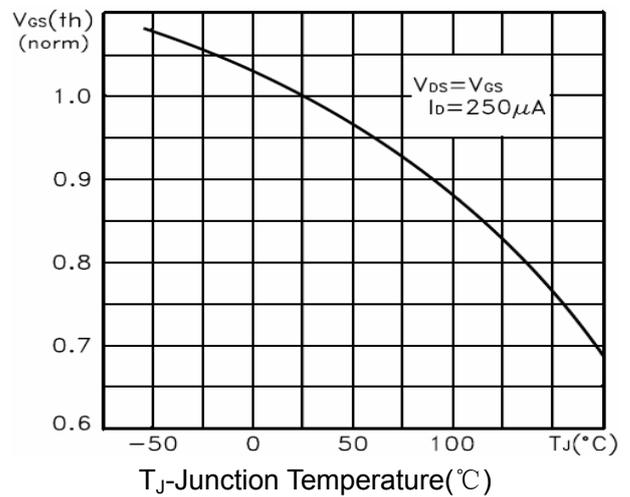
**Figure 10   V$_{GS(th)}$ vs Junction Temperature**

Square Wave Pluse Duration(sec)
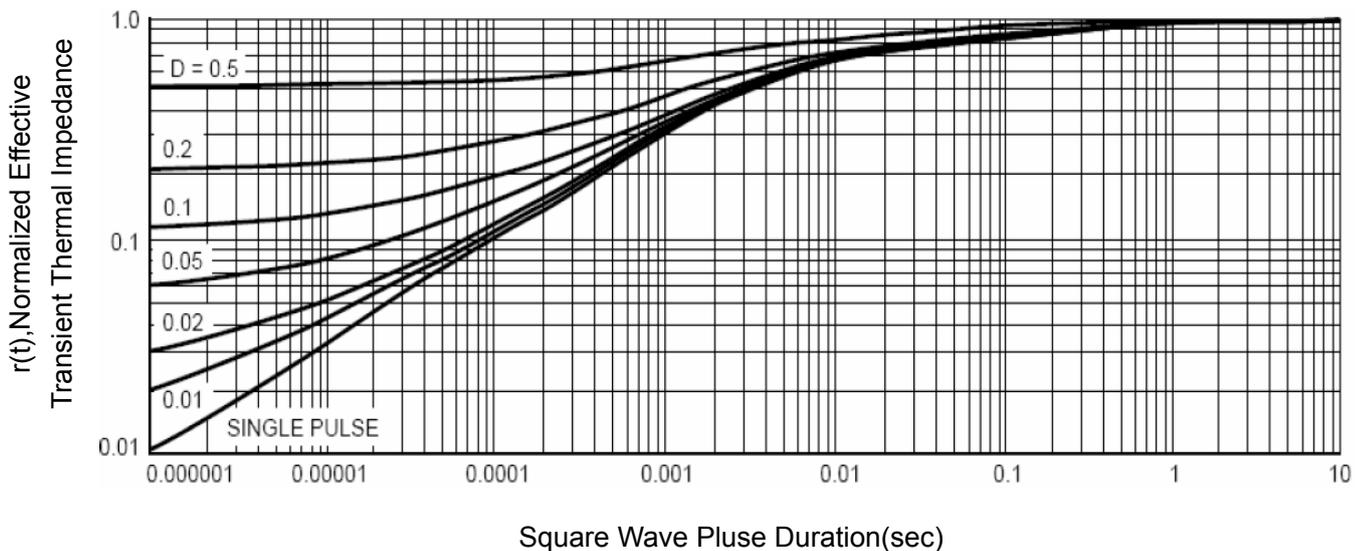
Figure 11 Normalized Maximum Transient Thermal Impedance