

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
650V	1.3Ω@10V	10A

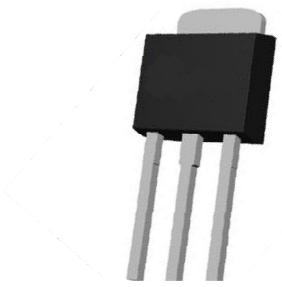
Feature

- Low Crss
- Low gate charge
- Fast switching

Application

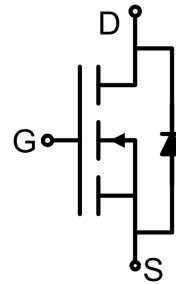
- High efficiency switch mode power supplies
- Electronic lamp ballasts
- UPS

Package

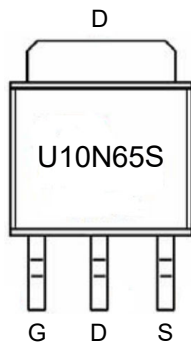


TO-251AB

Circuit diagram



Marking



Absolute maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current	I_D	10	A
Pulsed Drain Current	I_{DM}	30	A
Power Dissipation	P_D	147	W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.85	°C/W
Single pulse avalanche energy	E_{AS}	400	mJ
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-55 ~ +150	°C

Electrical characteristics (T_A=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	650			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 650V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{GS} = \pm 30V, V_{DS} = 0V$			±100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2		4	V
Drain-source on-resistance ¹⁾	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 4A$			1.3	Ω
Dynamic characteristics²⁾						
Input Capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$		1050		pF
Output Capacitance	C_{oss}			107		
Reverse Transfer Capacitance	C_{rss}			13		
Total Gate Charge	Q_g	$V_{DS} = 520V, V_{GS} = 10V, I_D = 8A$		46		nC
Gate-Source Charge	Q_{gs}			7		
Gate-Drain Charge	Q_{gd}			19		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 325V, I_D = 8A, R_{GEN} = 25\Omega$		36		nS
Turn-on rise time	t_r			82		
Turn-off delay time	$t_{d(off)}$			135		
Turn-off fall time	t_f			88		
Diode Forward Current ¹⁾	I_S				10	A
Diode Forward voltage	V_{DS}	$V_{GS} = 0V, I_S = 8A$			1.4	V
Reverse Recovery Time	t_{rr}	$T_J = 25^\circ C, I_F = 8A, di/dt = 100A/\mu s$ ¹⁾		420		nS
Reverse Recovery Charge	Q_{rr}			4.5		μC

Notes:

- 1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.
- 2) Guaranteed by design, not subject to production testing.

Typical Characteristics

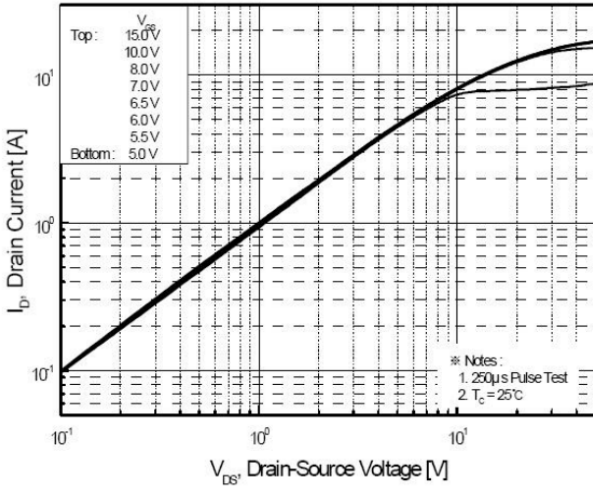


图1. 输出特性曲线
Fig. 1 On-State Characteristics

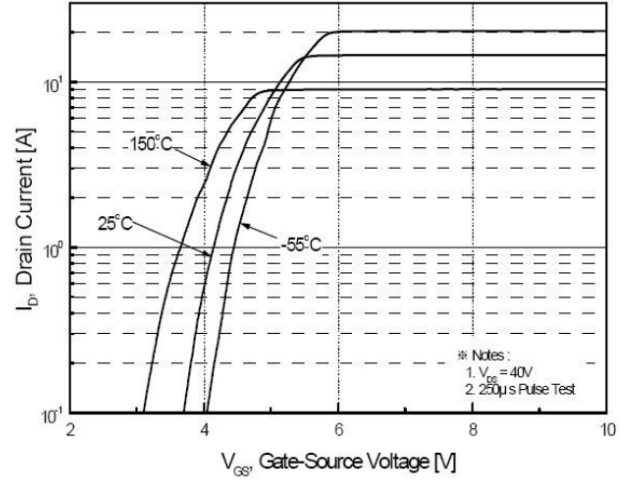


图2. 传输特性曲线
Fig. 2 Transfer Characteristics

T_J , Junction Temperature [$^\circ\text{C}$]

图3. 击穿电压随温度变化曲线

Fig. 3 Breakdown Voltage Variation vs Temperature

T_J , Junction Temperature [$^\circ\text{C}$]

图4. 导通电阻随温度变化曲线

Fig. 4 On-Resistance Variation vs Temperature

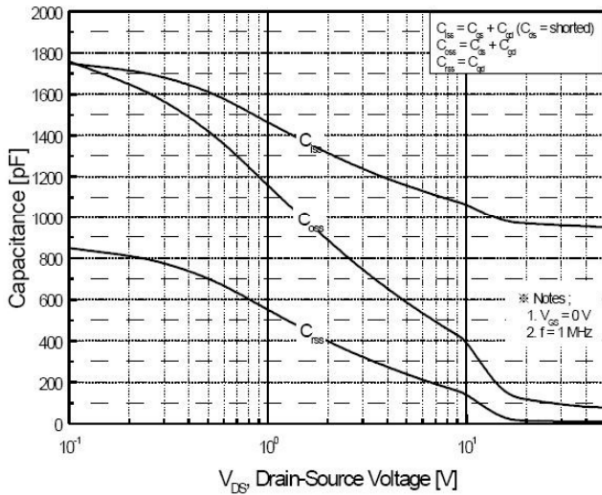


图5. 电容特性曲线
Fig. 5 Capacitance Characteristics

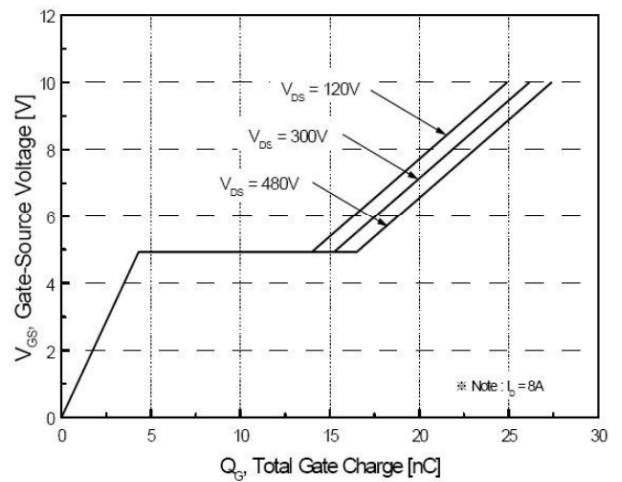


图6. 栅电荷特性曲线
Fig. 6 Gate Charge Characteristics

Typical Characteristics

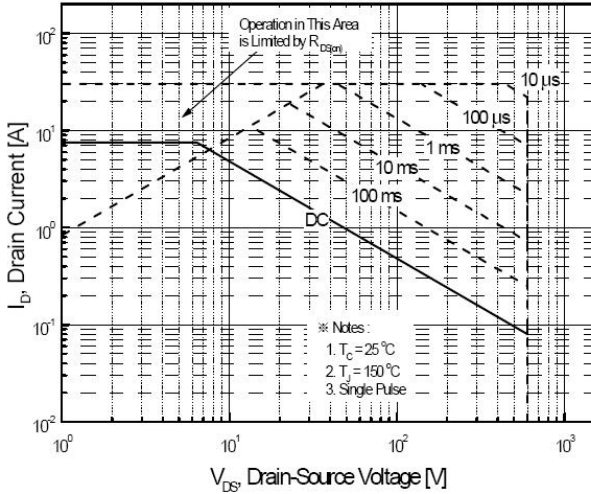


图7. 最大安全工作区

Fig. 7 Maximum Safe Operating Area

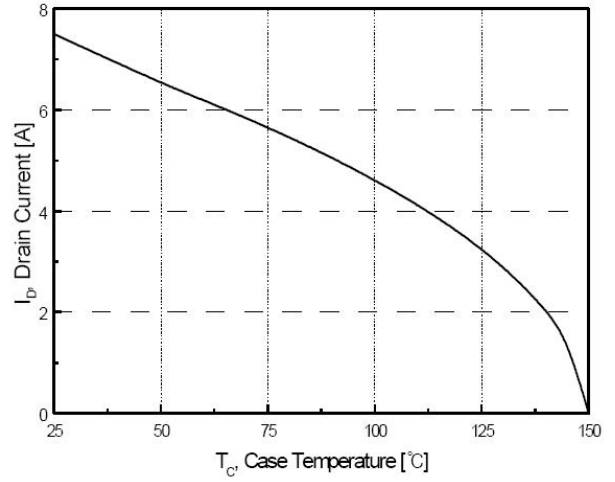


图8. 最大漏极电流随温度变化曲线

Fig. 8 Maximum Drain Current vs Case Temperature

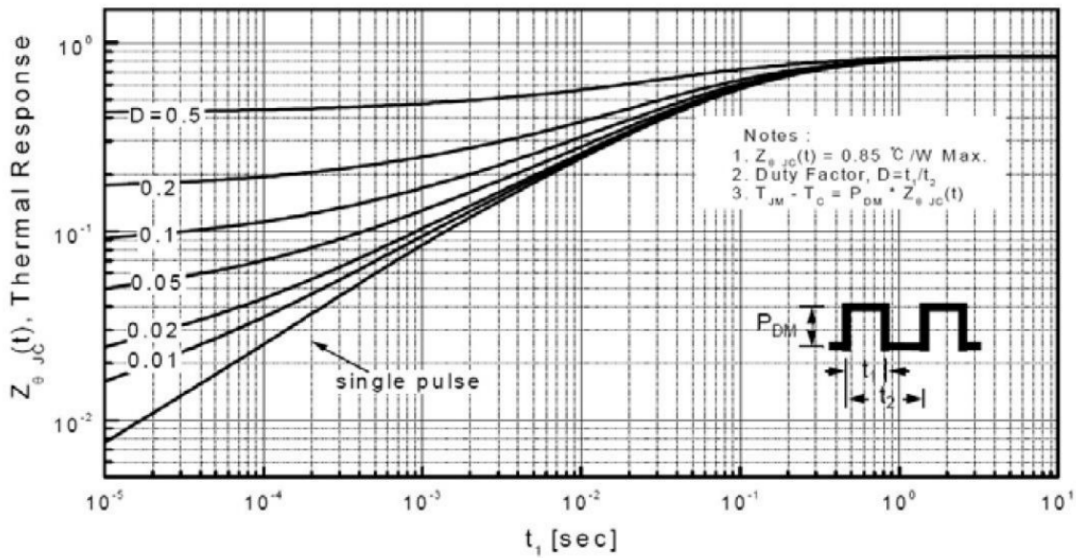
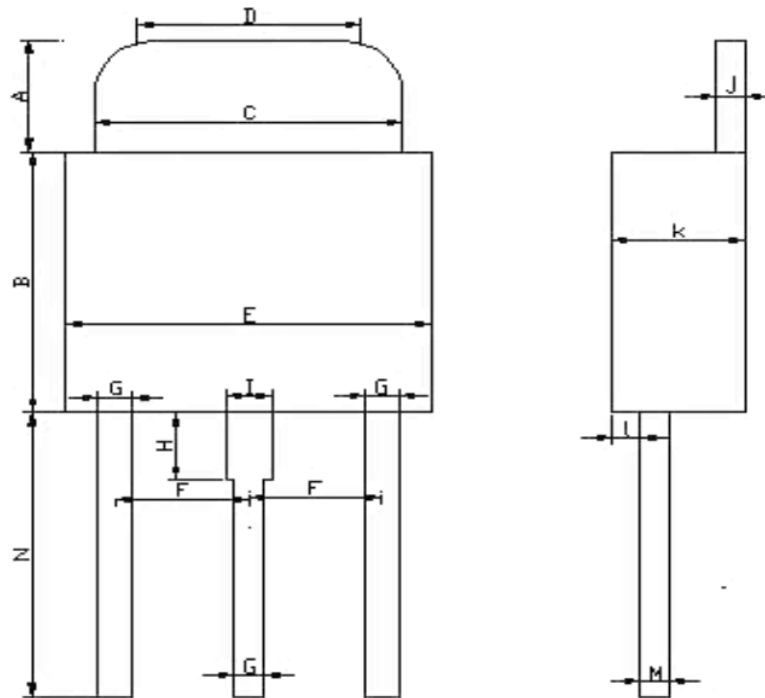


图9. 瞬态热响应曲线

Fig. 9 Transient Thermal Response Curve

TO-251AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.700	2.700	0.669	1.063
B	4.950	5.450	1.949	2.146
C	5.050	5.550	1.988	2.185
D	4.000	5.000	1.575	1.969
E	6.050	6.550	2.382	2.579
F	2.250	2.350	0.886	0.925
G	0.550	0.650	0.217	0.256
H	1.300	2.300	0.512	0.906
I	0.750	0.850	0.295	0.335
J	0.493	0.523	0.194	0.206
K	2.050	2.550	0.807	1.004
L	0.400	0.600	0.157	0.236
M	0.493	0.523	0.194	0.206
N	7.000	8.000	2.756	3.150