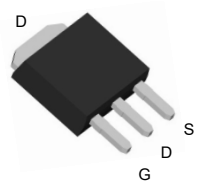
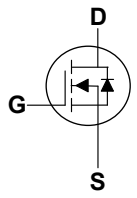
N-Channel Enhancement Mode MOSFET

Features

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant
- 100% UIS and Rg Tested

Pin Description

TO-251	Symbol
	

Applications

- High Frequency Point-of-Load,Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch

V_{DSS}	650	V
$R_{DS(ON)-Typ}$	3.8	Ω
I_D	2	A

Absolute Maximum Ratings(T_C=25℃, Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		650	V
V_{GSS}	Gate-Source Voltage		±30	V
T_J	Maximum Junction Temperature		-55 to 150	℃
T_{STG}	Storage Temperature Range		-55 to 150	℃
E_{AS}	Single Pulse Avalanche Energy[3]		65	mJ
I_{DM} ①	Pulse Drain Current Tested		8	A
I_D	Continuous Drain Current	T_C=25°C	2	A
P_D	Maximum Power Dissipation	T_C=25°C	35	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient[1] （Max）	62.5	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	3.57	℃/W

Note ①：Max. current is limited by bonding wire.

Note ②：UIS tested and pulse width are limited by maximum junction temperature 150℃.

Note ③：Surface Mounted on 1in^2 FR-4 board with 1oz.

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Electrical Characteristics (T_J=25℃, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250mA	650	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=650V, V_{GS}=0V	---	---	1	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	2	---	4	V
I_{GSS}	Gate Leakage Current	V_{GS}=±30V, V_{DS}=0V	---	---	±100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=10V , I_D=1A	---	3.8	4.5	Ω
Dynamic Characteristics⑤						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=2V, Freq.=1MHz	---	415	---	pF
C_{oss}	Output Capacitance		---	32	---	
C_{rss}	Reverse Transfer Capacitance		---	6	---	
$T_{d(on)}$	Turn-on Delay Time	V_{DD}=325V, R_G=10Ω, I_D=2A	---	8	---	nS
T_r	Turn-on Rise Time		---	6	---	
$T_{d(off)}$	Turn-off Delay Time		---	30	---	
T_f	Turn-off Fall Time		---	11	---	
Q_g	Total Gate Charge	V_{DD}=520V , V_{GS}=10V , I_D=2A	---	10.8	---	nC
Q_{gs}	Gate-Source Charge		---	1.5	---	
Q_{gd}	Gate-Drain Charge		---	4	---	
Source-Drain Characteristics （T_J=25℃）						
V_{SD}	Diode Forward Voltage②	V_{GS}=0V , I_S=2A ,T_J=25℃	---	---	1.4	V
t_{rr}	Reverse Recovery Time	I_S=2A, di_F/dt=100A/μs	---	430	---	nS
Q_{rr}	Reverse Recovery Charge		---	1.1	---	nC

Note ④： Pulse test (pulse width≤300us, duty cycle≤2%).

Note ⑤：Guaranteed by design, not subject to production testing.

Typical Characteristics

Figure 1. Output Characteristics

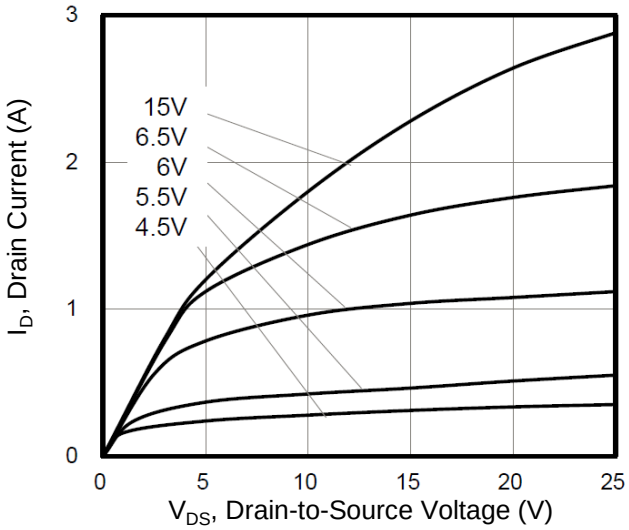


Figure 2. Transfer Characteristics

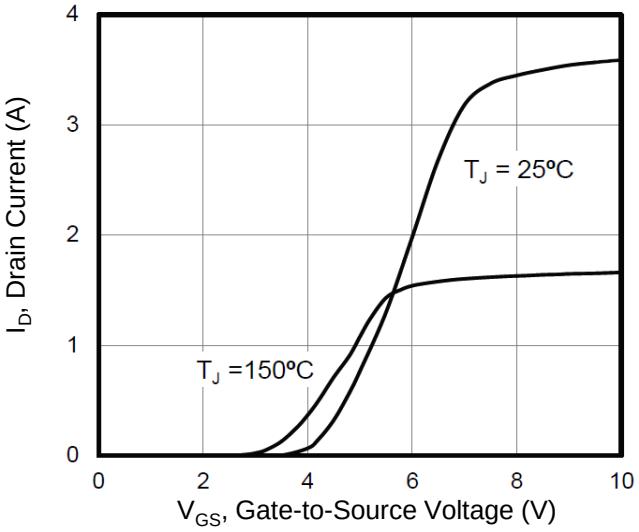


Figure 3. Drain Current vs. Temperature

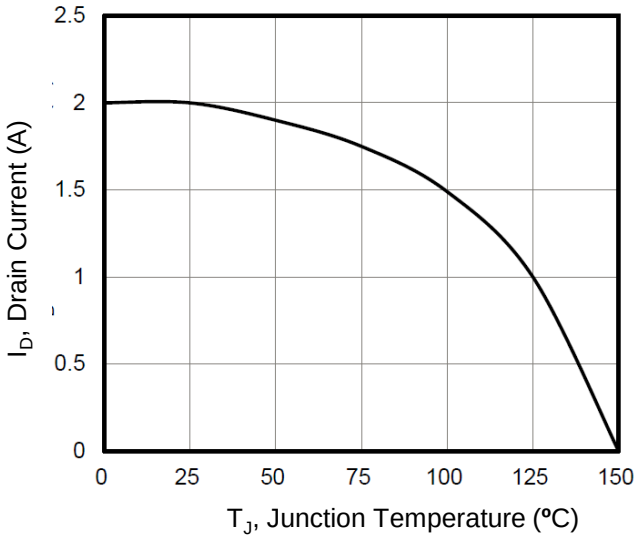


Figure 4. Capacitance

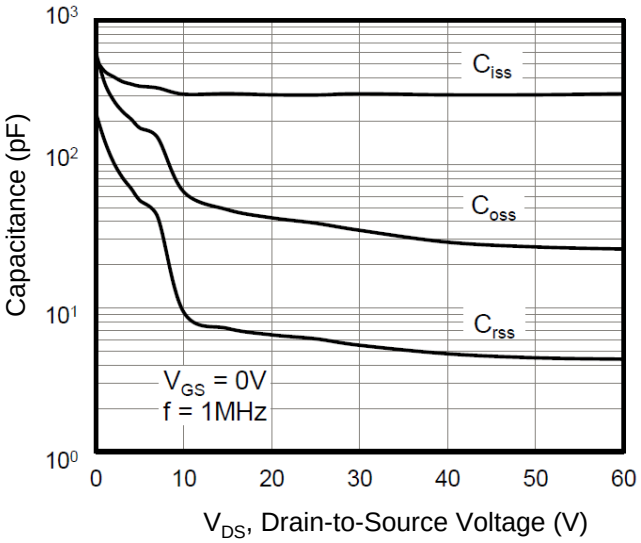


Figure 5. Gate Charge

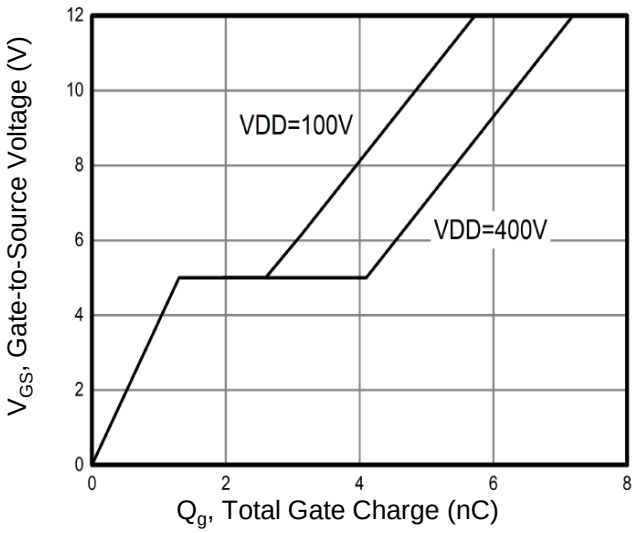


Figure 6. Body Diode Forward Voltage

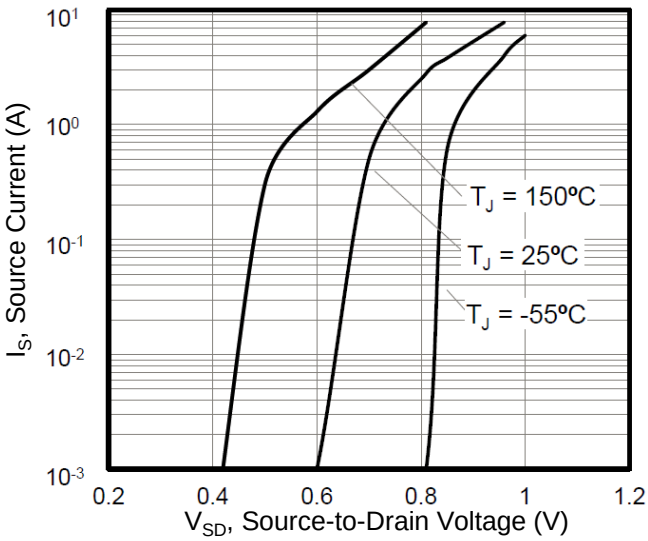


Figure 7. On-Resistance vs. Temperature

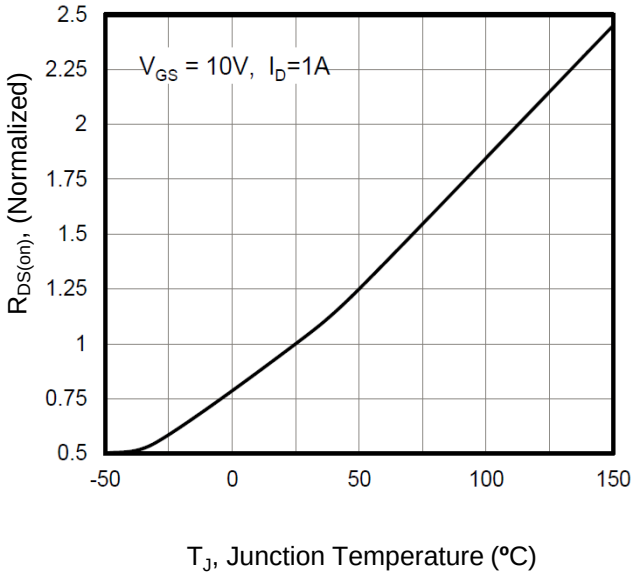


Figure 8. Power Dissipation vs. Temperature

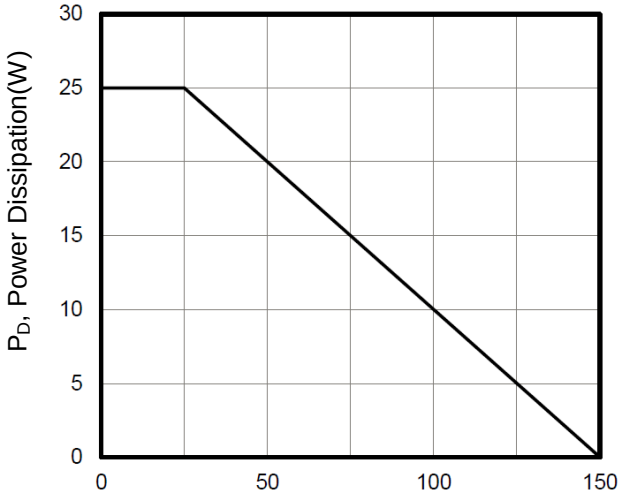
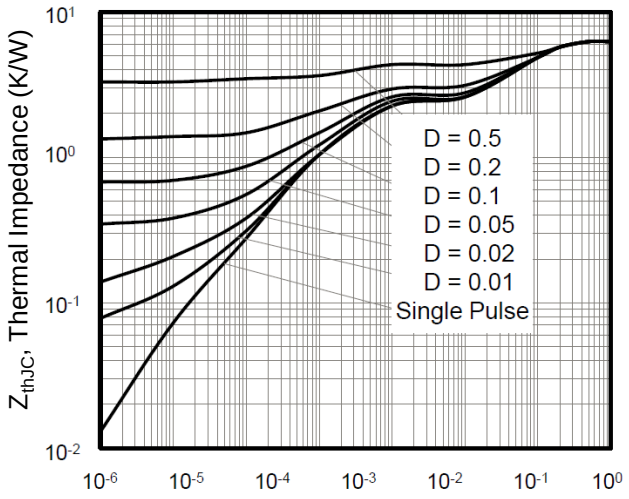


Figure 9. Transient Thermal Impedance



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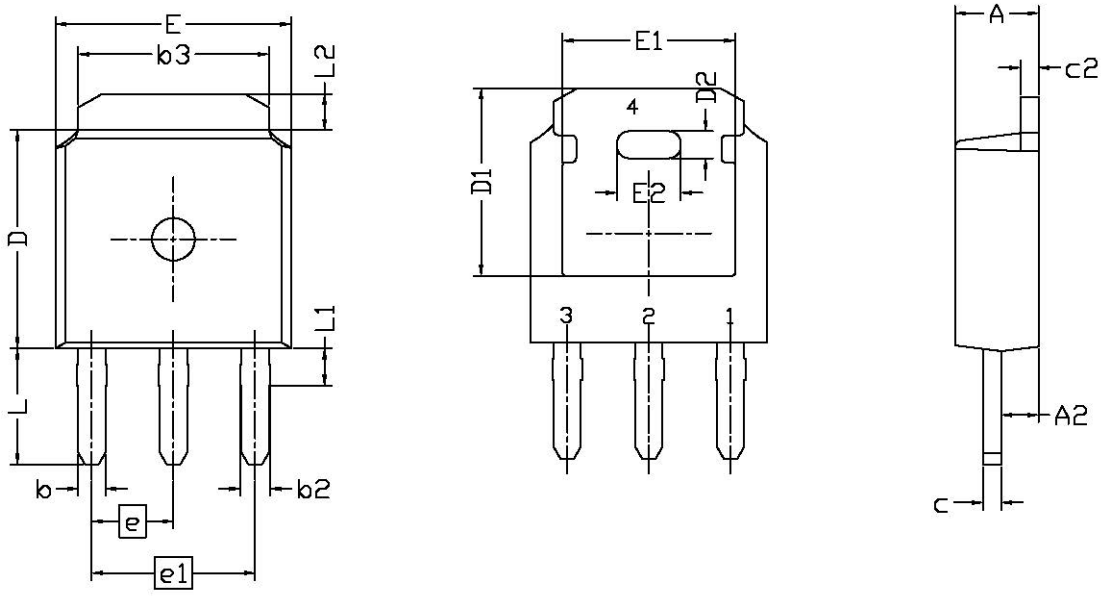
TO-251 Package Outline Dimensions



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	2.20	2.30	2.39	**A2**	0.90	1.00	1.14
b	0.63	0.76	0.85	**b2**	0.76	0.85	1.05
b3	5.10	5.40	5.60	**C**	0.46	0.51	0.61
C2	0.46	0.51	0.61	**D**	5.90	6.10	6.30
D1	5.25 REF			**D2**	0.508 BSC		
E	6.35	6.55	6.70	**E1**	5.06 REF		
E2	1.524 BSC			**e**	2.29 BSC		
e1	4.57 BSC			**L**	3.70	4.00	4.40
L1	1.15 REF			**L2**	0.90	1.06	1.20