

N-Channel Enhancement Mode MOSFET

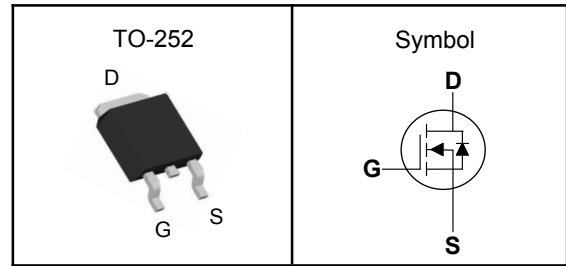
Features

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

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



V_{DSS}	60	V
$R_{DS(ON)-Typ}$	6.6	m Ω
I_D	80	A

Absolute Maximum Ratings ($T_J=25^\circ\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	N-Channel	Unit
V_{DSS}	Drain-Source Voltage	60	V
V_{GSS}	Gate-Source Voltage	± 20	V
T_J	Maximum Junction Temperature	-55 to 150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
E_{AS}	Single Pulse Avalanche Energy ^③	288	mJ
$I_{DM}^{①}$	Pulse Drain Current Tested	320	A
I_D	Continuous Drain Current	$T_c=25^\circ\text{C}$	A
P_D	Maximum Power Dissipation	$T_c=25^\circ\text{C}$	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ^① (Max)	51.9	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ^①	1.0	$^\circ\text{C}/\text{W}$

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

Note ② : UIS tested and pulse width are limited by maximum junction temperature 150 $^\circ\text{C}$.

Note ③ : Surface Mounted on 1in² FR-4 board with 1oz.



N-Channel Enhancement Mode MOSFET

Electrical Characteristics (T_J=25°C, 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	60	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =60V, 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} =±20V, V _{DS} =0V	---	---	±100	nA
R _{DS(ON)}	Drain-Source On-state Resistance	V _{GS} =10V, I _D =30A	---	6.6	8.2	mΩ
g _{fs}	Forward Transconductance	V _{GS} =5V, I _D =30A	---	32	---	S
Dynamic Characteristics^⑤						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =30V, Freq.=1MHz	---	4200	---	pF
C _{oss}	Output Capacitance		---	242	---	
C _{rss}	Reverse Transfer Capacitance		---	216	---	
T _{d(on)}	Turn-on Delay Time	V _{DS} =30V, V _{GS} =10V, R _G =1.8Ω, I _D =30A	---	8	---	nS
T _r	Turn-on Rise Time		---	22	---	
T _{d(off)}	Turn-off Delay Time		---	28	---	
T _f	Turn-off Fall Time		---	16	---	
Q _g	Total Gate Charge	V _{DS} =30V, V _{GS} =10V, I _D =30A	---	73	---	nC
Q _{gs}	Gate-Source Charge		---	18	---	
Q _{gd}	Gate-Drain Charge		---	15	---	
Source-Drain Characteristics						
V _{SD} ^④	Diode Forward Voltage	I _S =30A, V _{GS} =0V	---	---	1.2	V
T _{rr}	Reverse Recovery Time	I _S =30A, dI _F /dt=100A/us	---	35	---	nS
Q _{rr}	Reverse Recovery Charge		---	51	---	nC

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

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

N-Channel Enhancement Mode MOSFET
Typical Characteristics

Fig.1 Typical Output Characteristics

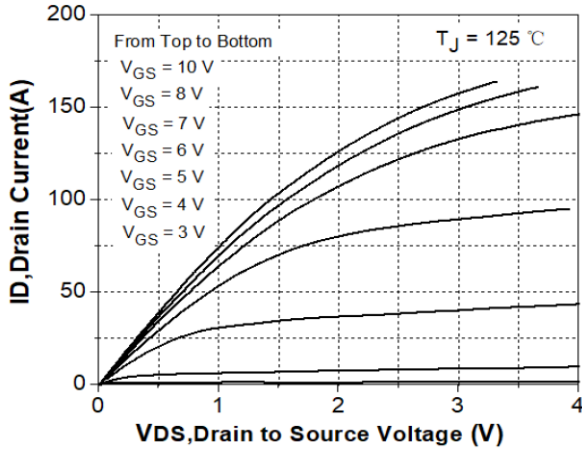


Fig. 2 Transconductance vs. Drain Current

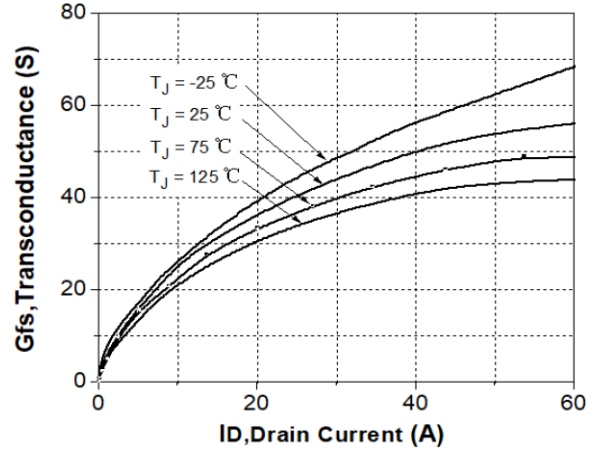


Fig.3 Typical Transfer Characteristics

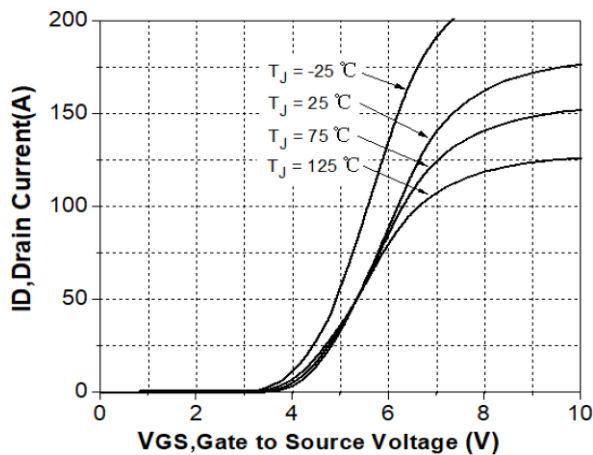


Fig. 4 State Resistance vs. Drain Current @-25°C

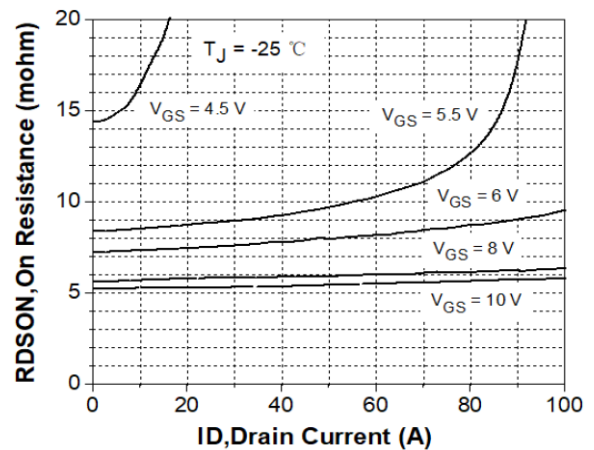


Fig.5 State Resistance vs. Drain Current @25°C

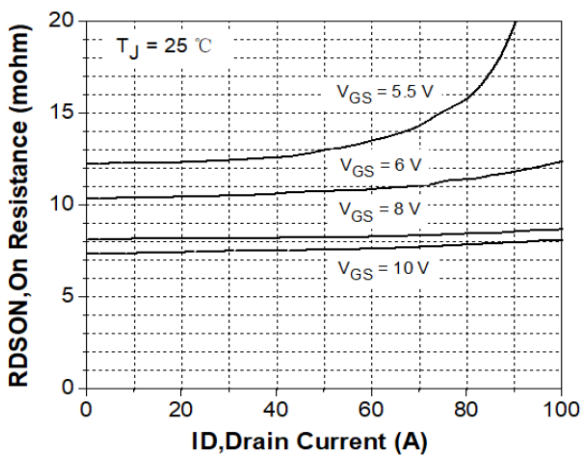
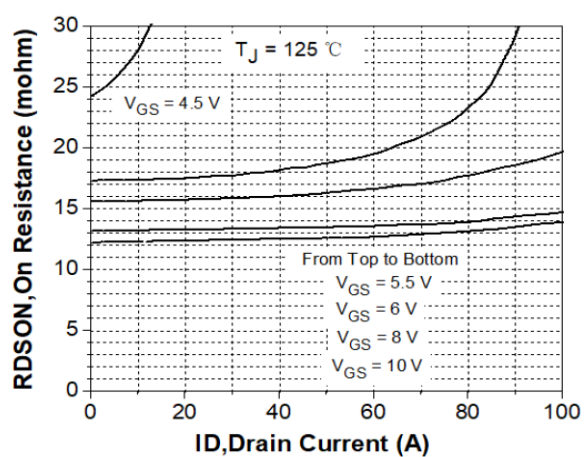


Fig. 6 State Resistance vs. Drain Current @125°C



N-Channel Enhancement Mode MOSFET

Fig.7 Typical Capacitance vs. Drain Source Voltage

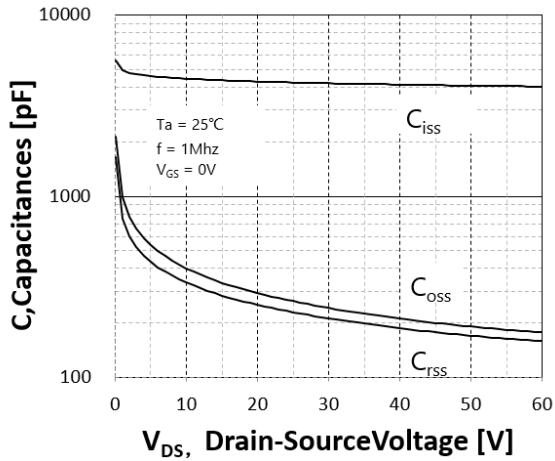


Fig.8 Dynamic Input Characteristics

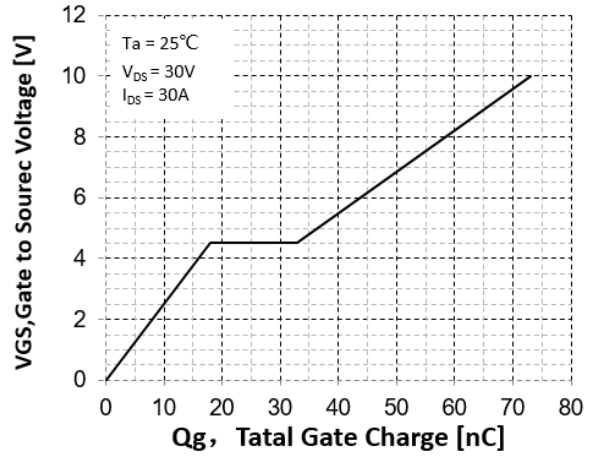


Fig.9 Breakdown Voltage vs. Junction Temperature

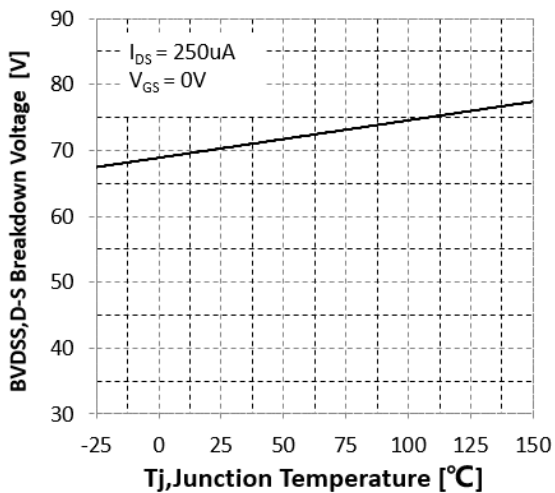


Fig. 10 Gate Threshold Voltage vs. Junction Temperature

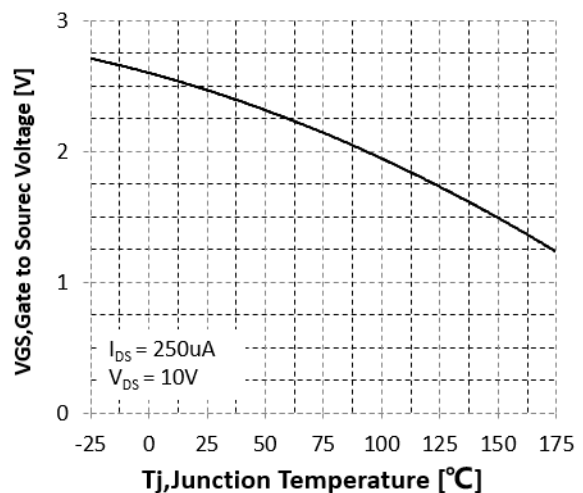


Fig.11 Safe Operating Area

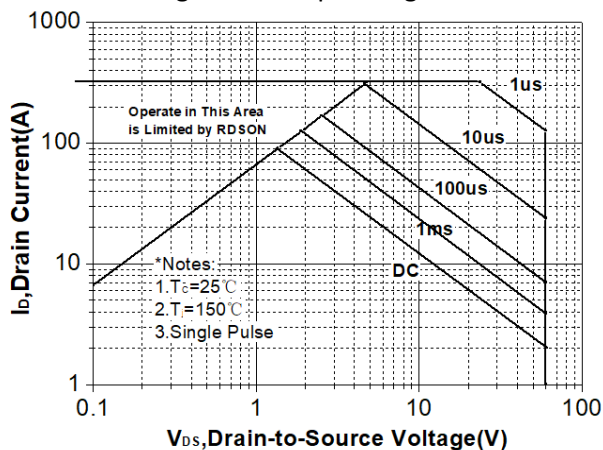
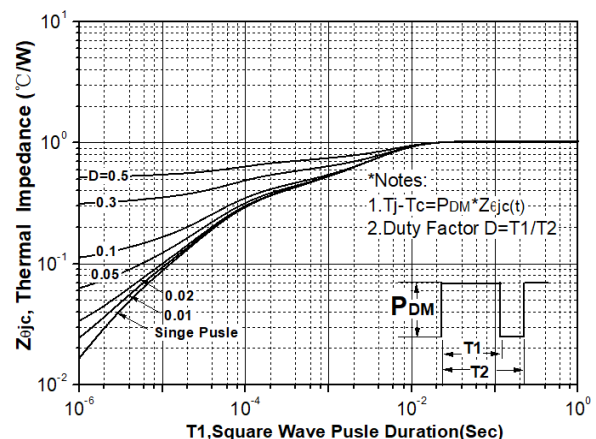
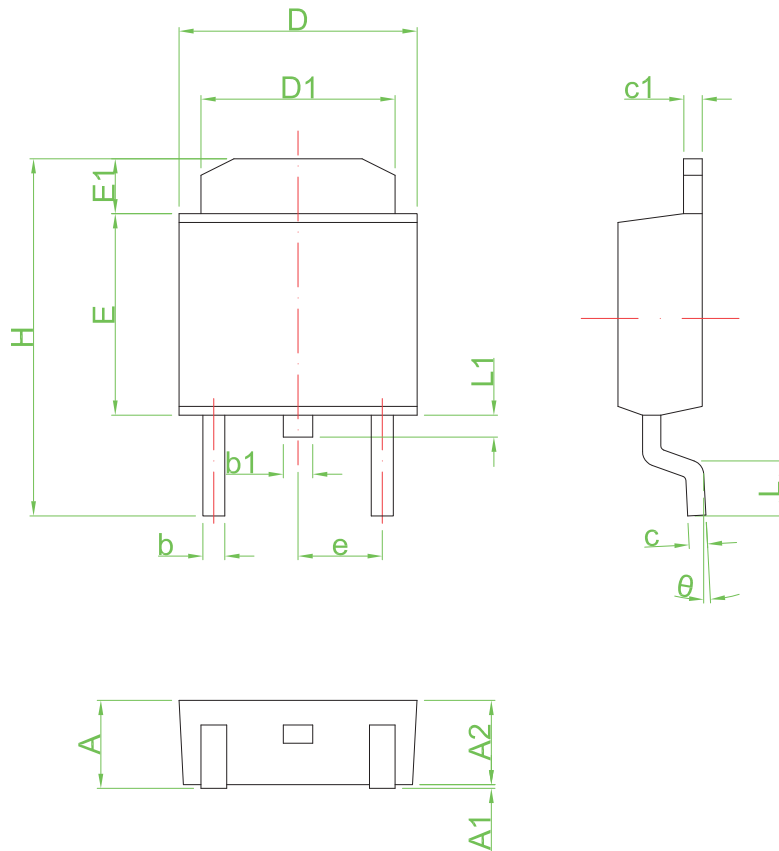


Fig. 12 Transient Thermal Response Curve



N-Channel Enhancement Mode MOSFET
TO-252 Package Outline Dimensions


Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	2.25	2.65	0.089	0.104
A1	0.00	0.15	0.000	0.006
A2	2.20	2.40	0.087	0.094
b	0.50	0.70	0.020	0.028
b1	0.70	0.90	0.028	0.035
c	0.46	0.66	0.018	0.026
c1	0.46	0.66	0.018	0.026
D	6.30	6.70	0.248	0.264
D1	5.20	5.40	0.205	0.213
E	5.30	5.70	0.209	0.224
E1	1.40	1.60	0.055	0.063
H	9.40	9.90	0.370	0.390
e	2.30 TYP		0.09 TYP	
L	1.40	1.77	0.055	0.070
L1	0.50	0.70	0.020	0.028
theta	0°	8°	0°	8°