

N-Channel Enhancement Mode MOSFET

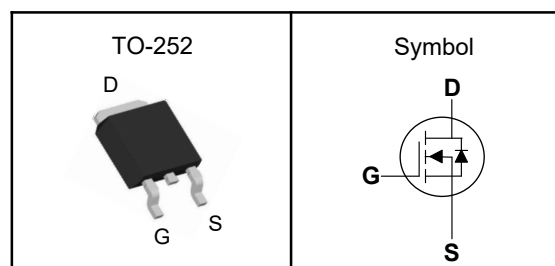
Features

- Low R_{ds(on)} for low conduction loss
- Reliable and Rugged
- ROHS Compliant & Halogen-Free

Applications

- Power Management in Desktop Computer
- DC/DC Converters

Pin Description



V _{DSS}	70	V
R _{DS(ON)-Typ}	5.2	mΩ
I _D	70	A

Absolute Maximum Ratings (T_J=25°C, Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit	
V _{DSS}	Drain-Source Voltage	70	V	
V _{GSS}	Gate-Source Voltage	±20	V	
T _J	Maximum Junction Temperature	-55 to 150	°C	
T _{STG}	Storage Temperature Range	-55 to 150	°C	
E _{AS}	Single Pulse Avalanche Energy ^③	168	mJ	
I _{DM} ^①	Pulse Drain Current Tested	280	A	
I _D	Continuous Drain Current	T _c =25°C	70	A
P _D	Maximum Power Dissipation	T _c =25°C	96	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
R _{θJA}	Thermal Resistance Junction-Ambient ₁ (Max)	55	°C/W
R _{θJC}	Thermal Resistance Junction-Case ₁	1.3	°C/W

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

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

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

**N-Channel Enhancement Mode MOSFET****Electrical Characteristics** ($T_J=25^\circ\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250mA$	70	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=70V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	---	4.0	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=40A$	---	5.2	6.0	$m\Omega$
Dynamic Characteristics^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=35V,$ Freq.=1MHz	---	2056	---	pF
C_{oss}	Output Capacitance		---	716	---	
C_{rss}	Reverse Transfer Capacitance		---	50	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=35V, V_{GS}=10V,$ $R_G=0.9\Omega, I_D=40A$	---	14	---	nS
T_r	Turn-on Rise Time		---	48	---	
$T_{d(off)}$	Turn-off Delay Time		---	28.5	---	
T_f	Turn-off Fall Time		---	12	---	
Q_g	Total Gate Charge	$V_{DS}=35V,$ $V_{GS}=10V, I_D=40A$	---	37	---	nC
Q_{gs}	Gate-Source Charge		---	8.5	---	
Q_{gd}	Gate-Drain Charge		---	13	---	
Source-Drain Characteristics ($T_J=25^\circ\text{C}$)						
V_{SD}	Diode Forward Voltage ₂	$V_{GS}=0V, I_S=40A, T_J=25^\circ\text{C}$	---	---	1.3	V
t_{rr}	Reverse Recovery Time	$I_D=40A,$ $di/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	40	---	nS
Q_{rr}	Reverse Recovery Charge		---	28	---	nC

Note ④ : Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

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

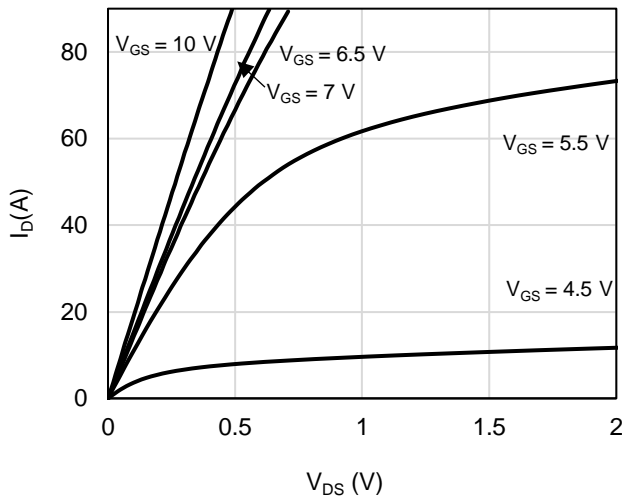
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Typical Characteristics


Figure 1: On-Region Characteristics

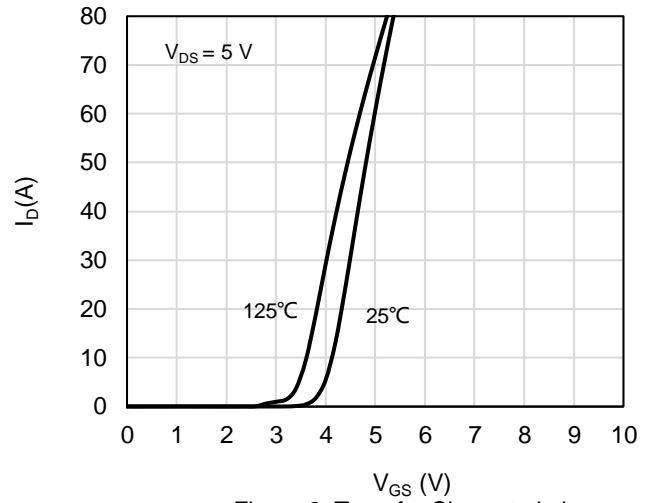


Figure 2: Transfer Characteristics

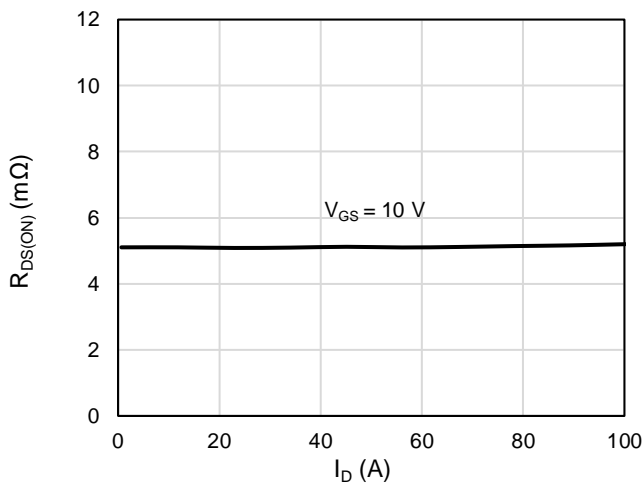


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

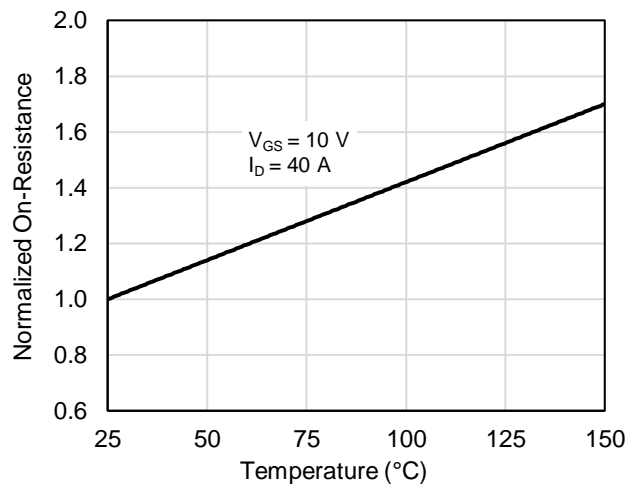


Figure 4: On-Resistance vs. Junction Temperature

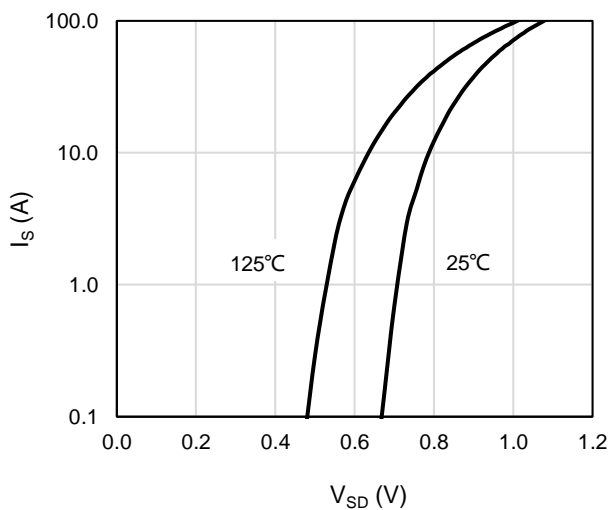


Figure 5: Body-Diode Characteristics

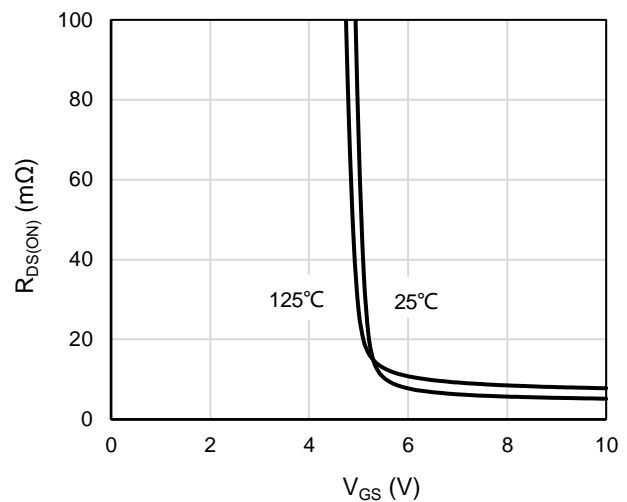


Figure 6: On-Resistance vs. Gate-Source Voltage

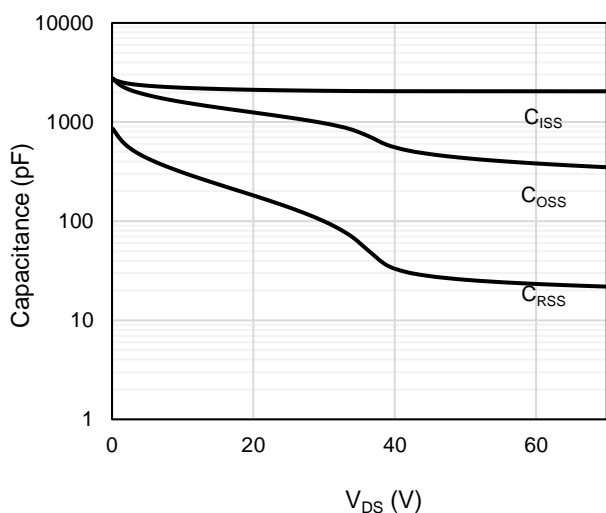
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Figure 7: Capacitance Characteristics

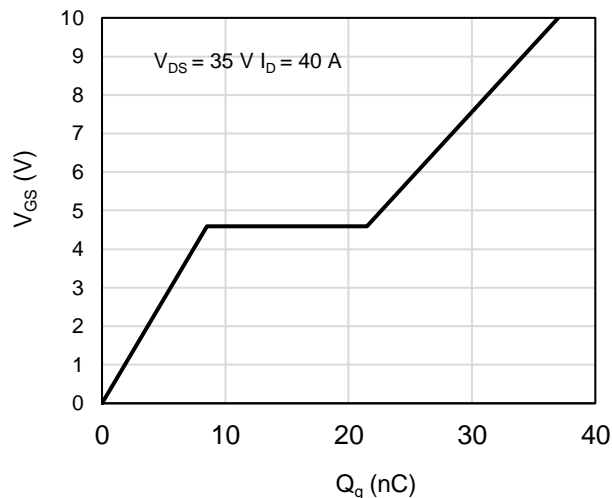


Figure 8: Gate-Charge Characteristics

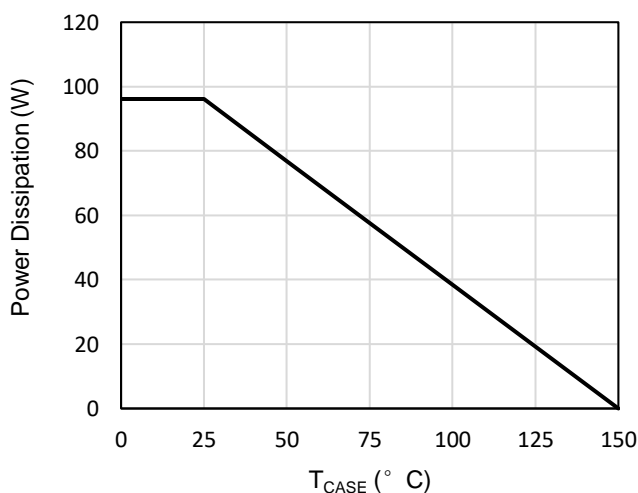


Figure 9: Power De-rating

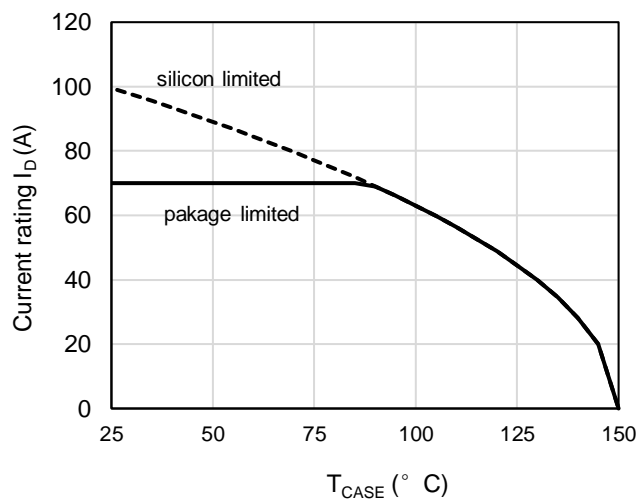


Figure 10: Current De-rating

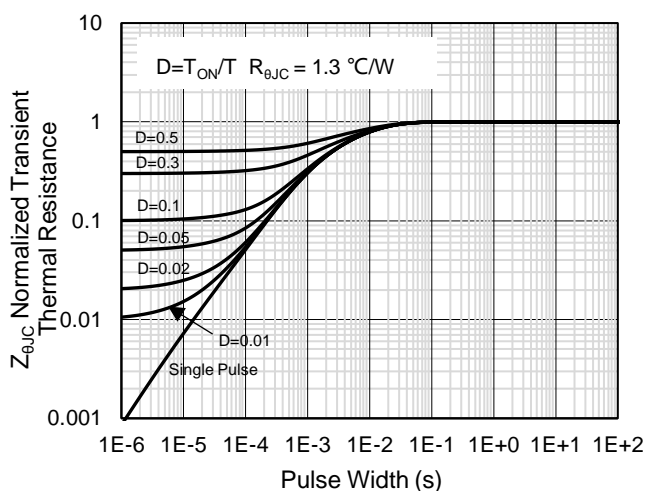


Figure 11: Normalized Maximum Transient Thermal Impedance

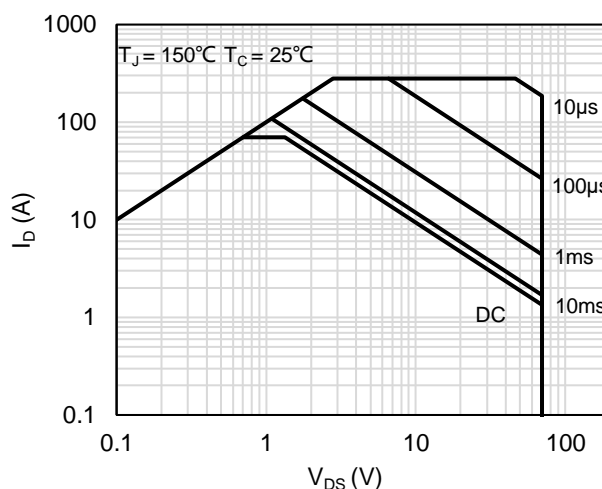
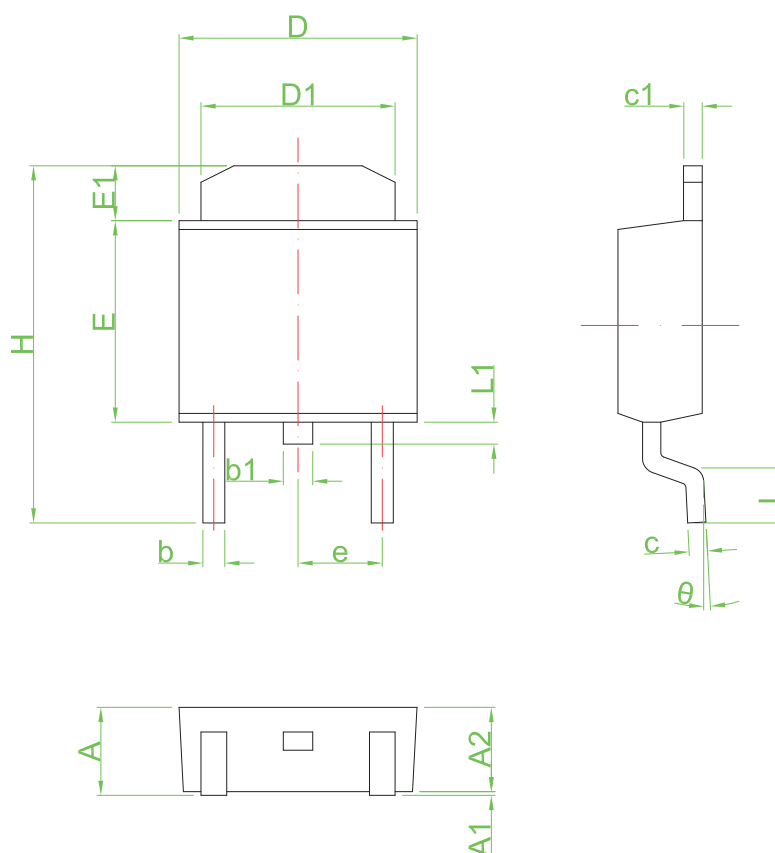


Figure 12: Maximum Forward Biased Safe Operating Area

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
θ	0°	8°	0°	8°