

N-Channel Enhancement Mode MOSFET

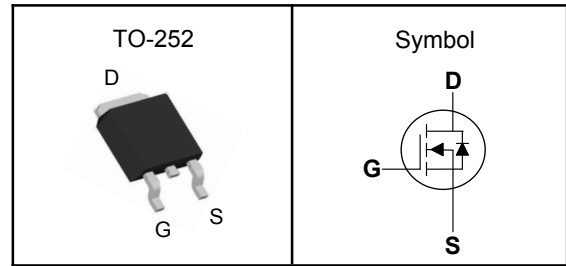
Features

- 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}	40	V
$R_{DS(ON)-Typ}$	5	m Ω
I_D	80	A

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

Symbol	Parameter	N-Channel	Unit
V_{DSS}	Drain-Source Voltage	40	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 (L=0.1mH)	51	mJ
$I_{DM}^{①}$	300 μs Pulse Drain Current Tested	$T_C=25^\circ\text{C}$	224
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$	17.3
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	80
P_D	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	2.5
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	54

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ₁ (Steady State)	50	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ₁ (Steady State)	2.3	$^\circ\text{C}/\text{W}$

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.



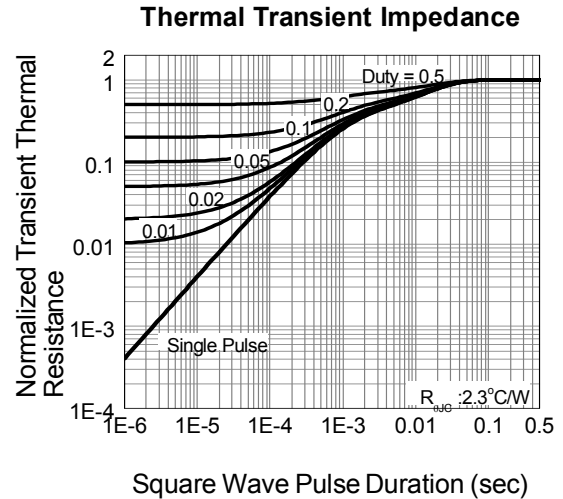
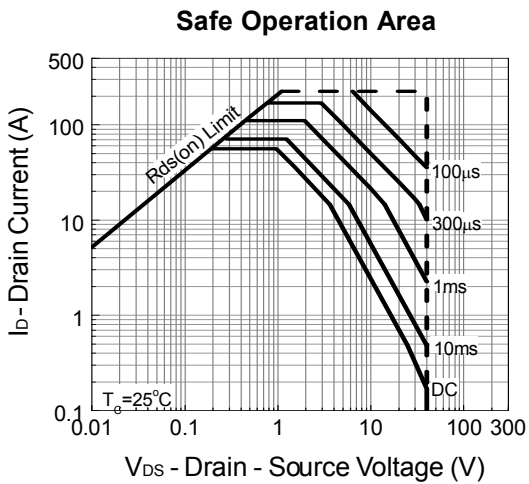
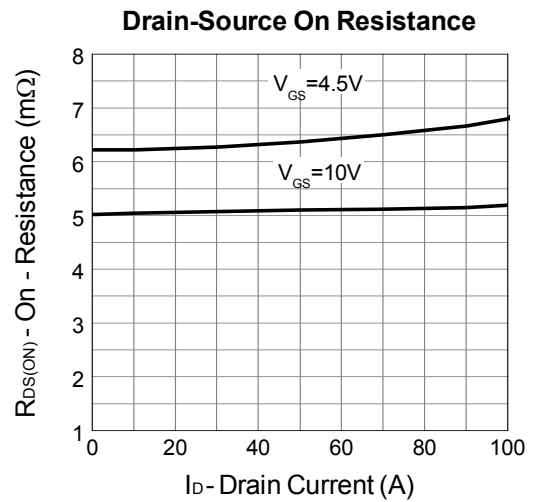
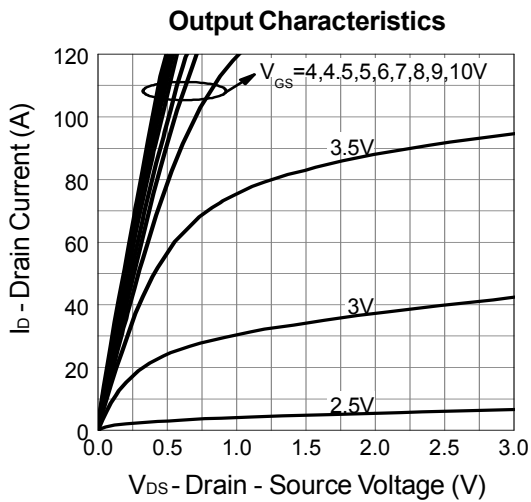
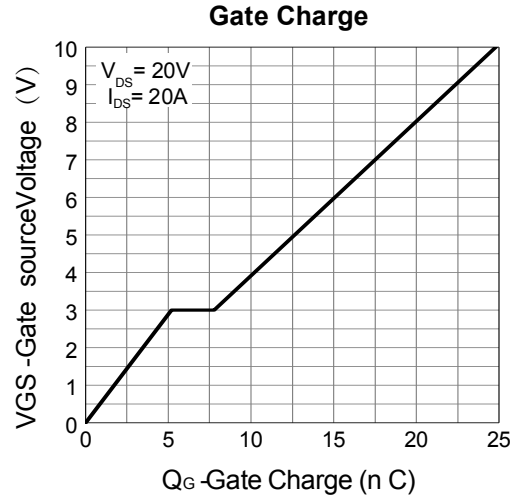
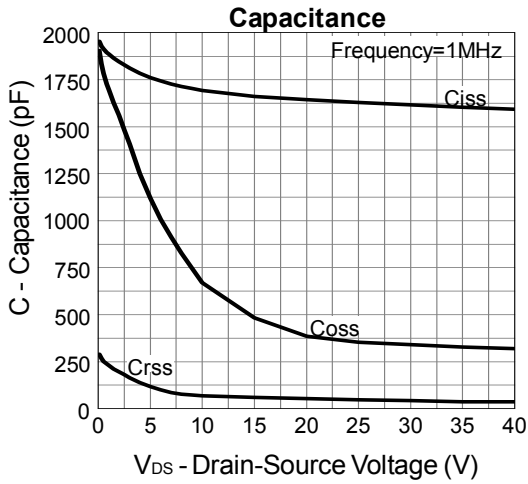
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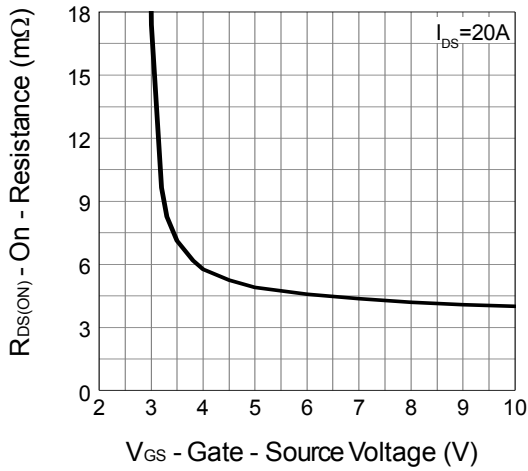
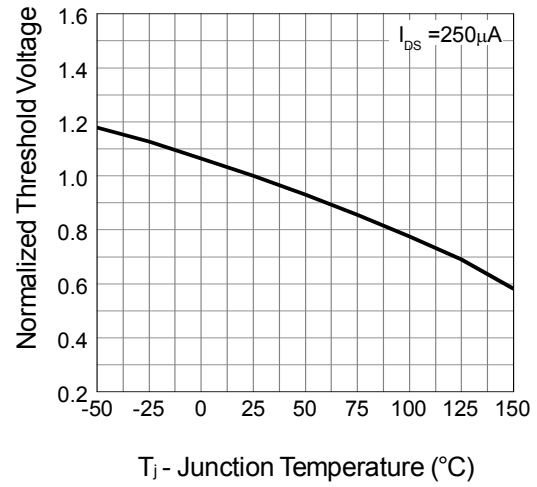
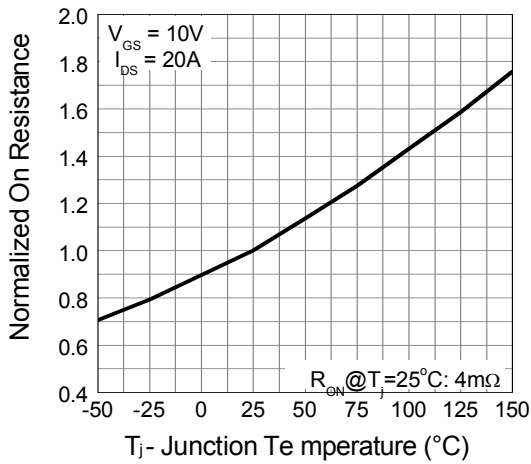
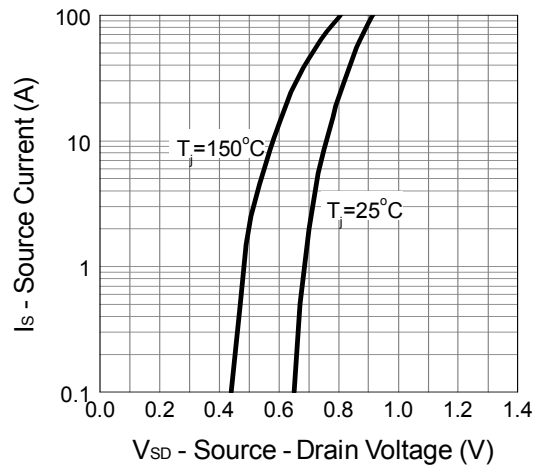
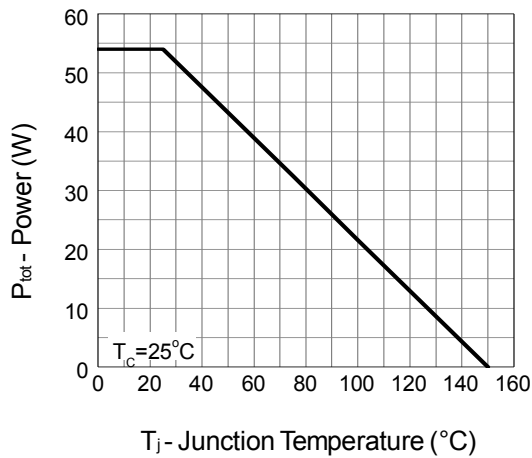
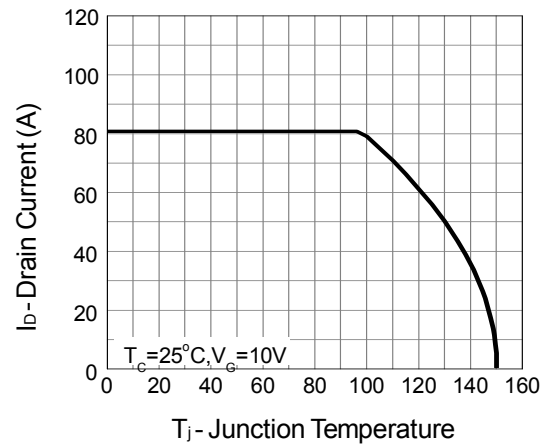
Electrical Characteristics ($T_J=25^{\circ}\text{C}$, Unless Otherwise Noted)

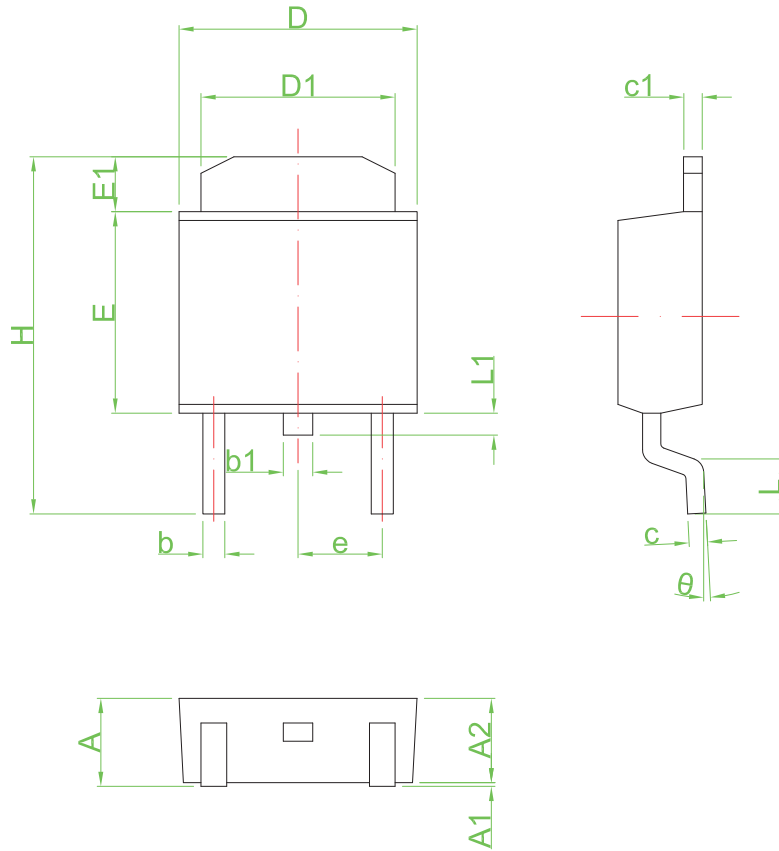
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250mA$	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=32V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.3	---	2.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=20A$	---	5	5.8	$m\Omega$
		$V_{GS}=4.5V, I_D=10A$	---	6.2	7.8	$m\Omega$
gfs	Forward Transconductance	$V_{DS}=5V, I_{DS}=20A$	---	31	---	S
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=20V, \text{Freq.}=1MHz$	---	1645	---	pF
C_{oss}	Output Capacitance		---	385	---	
C_{rss}	Reverse Transfer Capacitance		---	55	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=20V, R_L=20\Omega, I_{DS}=1A, V_{GEN}=10V, R_G=6\Omega$	---	14.3	---	nS
T_r	Turn-on Rise Time		---	7.7	---	
$T_{d(off)}$	Turn-off Delay Time		---	32.6	---	
T_f	Turn-off Fall Time		---	26.6	---	
Q_g	Total Gate Charge	$V_{DS}=20V, V_{GS}=4.5V, I_{DS}=20A$	---	11.5	---	nC
Q_{gs}	Gate-Source Charge		---	5.2	---	
Q_{gd}	Gate-Drain Charge		---	2.6	---	
Source-Drain Characteristics ($T_J=25^{\circ}\text{C}$)						
V_{SD}	Diode Forward Voltage _z	$V_{GS}=0V, I_S=20A, T_J=25^{\circ}\text{C}$	---	0.75	1.1	V
t_{rr}	Reverse Recovery Time	$I_S=20A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	---	28	---	nS
Q_{rr}	Reverse Recovery Charge		---	20	---	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.

N-Channel Enhancement Mode MOSFET
Typical Characteristics


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Gate-Source on Resistance

Gate Threshold Voltage

Drain-Source On Resistance

Source-Drain Diode Forward

Power Dissipation

Drain Current


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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°