

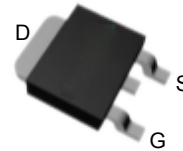
Features

- 30V/90A,
 $R_{DS(ON)} = 3.5m\Omega$ (typ.) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 5.5m\Omega$ (typ.) @ $V_{GS} = 4.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)
- Moisture Sensitivity Level MSL1
(per JEDEC J-STD-020D)

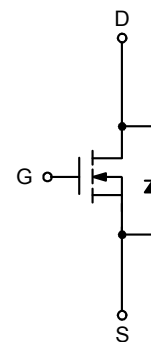
Applications

- Power Management in Desktop Computer or DC/DC Converters.

Pin Description



Top View of TO-252-2



N-Channel MOSFET

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

Symbol	Parameter		Rating	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		30	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	°C
I _S	Diode Continuous Forward Current	T _C =25°C	90	A
I _D	Continuous Drain Current	T _C =25°C	90	A
		T _C =100°C	50	
I _{DM} ^b	Pulse Drain Current	T _C =25°C	280	A
P _D	Maximum Power Dissipation	T _C =25°C	50	W
		T _C =100°C	20	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	2.5	°C/W
I _D	Continuous Drain Current	T _A =25°C	15	A
		T _A =70°C	12	
I _{DM} ^b	Pulse Drain Current	T _A =25°C	60	A
P _D	Maximum Power Dissipation	T _A =25°C	2.1	W
		T _A =70°C	1.3	
R _{θJA} ^c	Thermal Resistance-Junction to Ambient	t ≤ 10s	20	°C/W
		Steady State	60	
I _{AS} ^d	Avalanche Current, Single pulse	L=0.5mH	20	A
E _{AS} ^d	Avalanche Energy, Single pulse	L=0.5mH	100	mJ

Note a : Max. continuous current is limited by bonding wire.

Note b : Pulse width is limited by max. junction temperature.

Note c : Surface mounted on 1in² pad area, steady state t = 999s.

Note d : UIS tested and pulse width are limited by maximum junction temperature 150°C (initial temperature T_J=25°C).

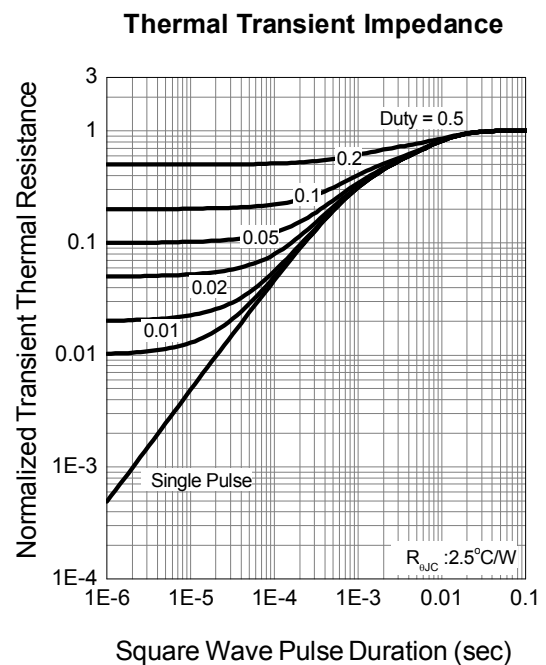
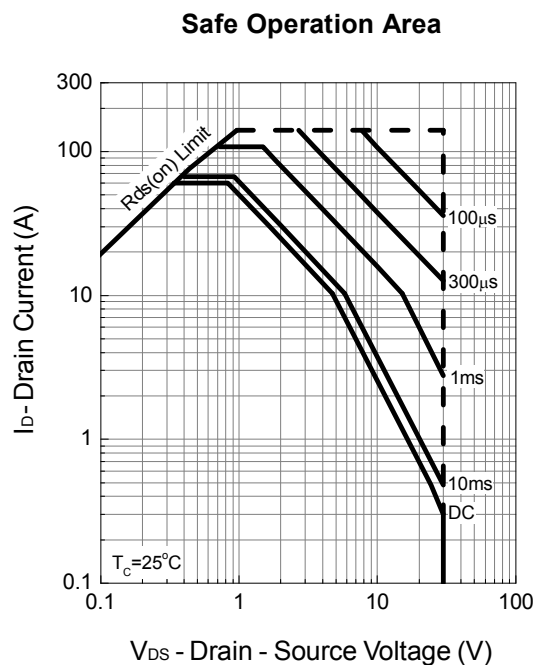
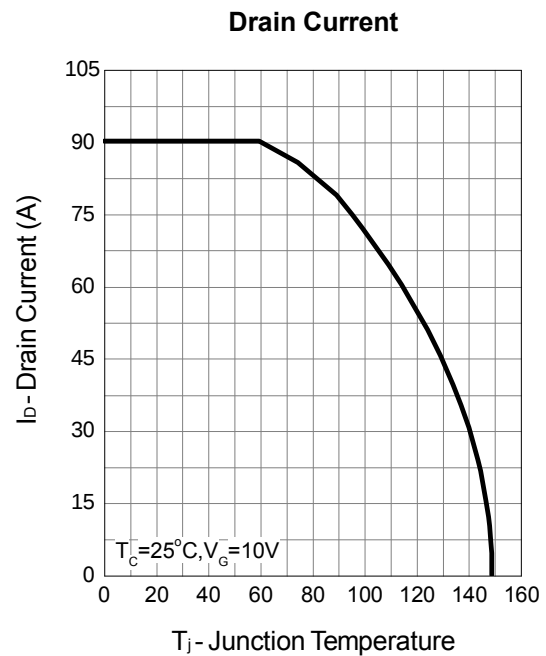
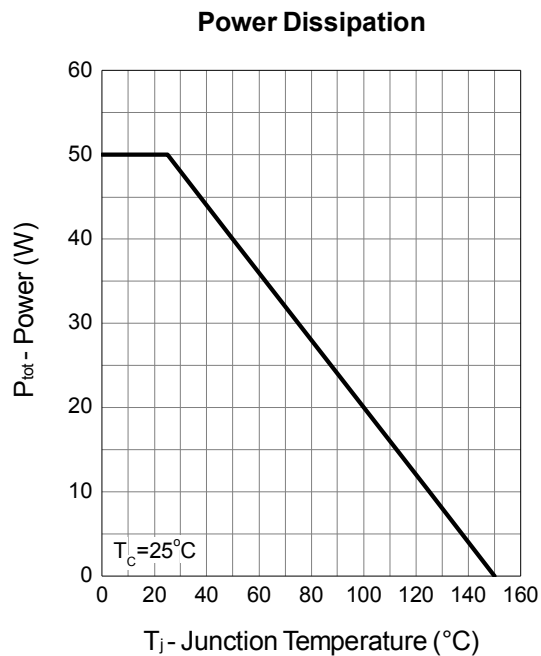
Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	30	-	-	V
BV _{DSS} t	Drain-Source Breakdown Voltage (transient)	V _{GS} =0V, I _{D(aval)} =20A T _{case} =25°C, t _{transient} =100ns	34	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =24V, V _{GS} =0V T _J =85°C	- -	- -	1 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1.0	1.5	2.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ^e	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =40A T _J =125°C V _{GS} =4.5V, I _{DS} =20A	- - -	4 5.9 5.5	5.5 - 7	mΩ
Gfs	Forward Transconductance	V _{DS} =5V, I _{DS} =40A	-	95	-	S
Diode Characteristics						
V _{SD} ^e	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	-	0.8	1.1	V
t _{rr}	Reverse Recovery Time	I _{DS} =40A, dI _{SD} /dt=100A/μs	-	21	-	ns
t _a	Charge Time		-	13.2	-	
t _b	Discharge Time		-	7.8	-	
Q _{rr}	Reverse Recovery Charge		-	17	-	nC
Dynamic Characteristics ^f						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	-	3	4.5	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	1200	1500	1820	pF
C _{oss}	Output Capacitance		210	260	310	
C _{rss}	Reverse Transfer Capacitance		100	130	175	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	15	28	ns
t _r	Turn-on Rise Time		-	13	24	
t _{d(OFF)}	Turn-off Delay Time		-	32	57	
t _f	Turn-off Fall Time		-	9	17	
Gate Charge Characteristics ^f						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =40A	-	12	17	nC
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =40A	-	25	37	
Q _{gth}	Threshold Gate Charge		-	1.5	-	
Q _{gs}	Gate-Source Charge		-	3	-	
Q _{gd}	Gate-Drain Charge		-	7.5	-	

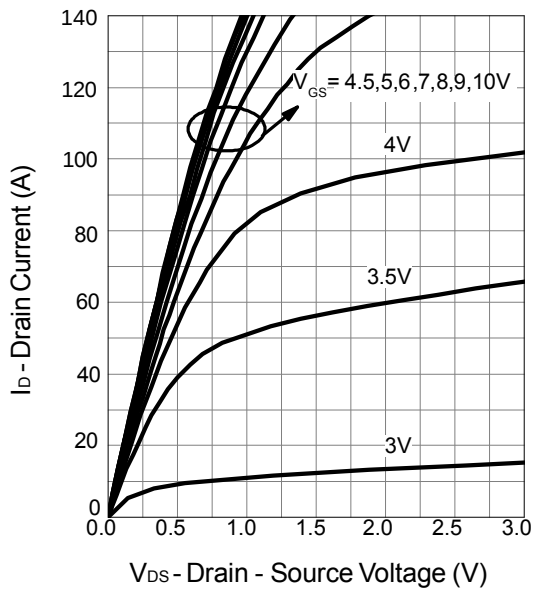
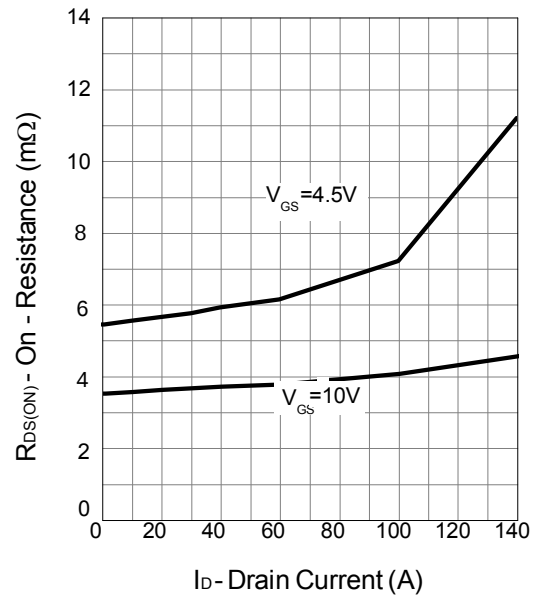
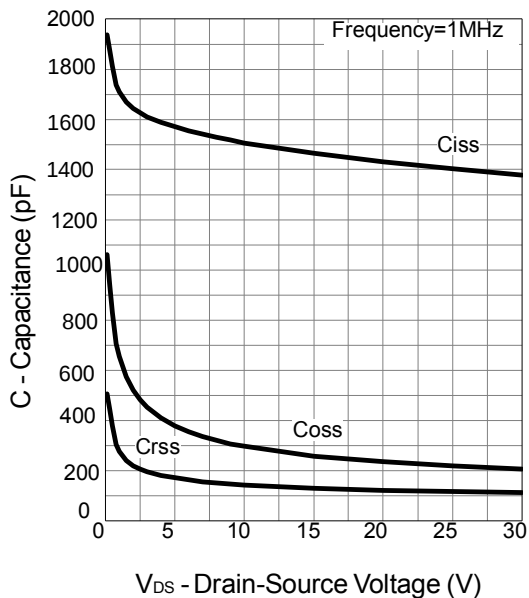
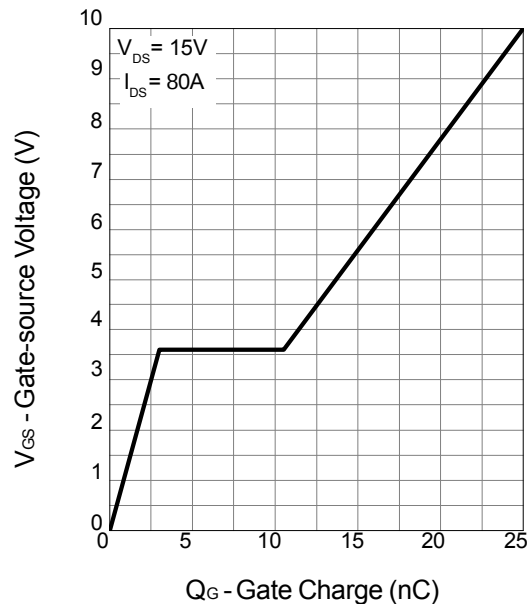
Note e : Pulse test ; pulse width≤300μs, duty cycle≤2%.

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

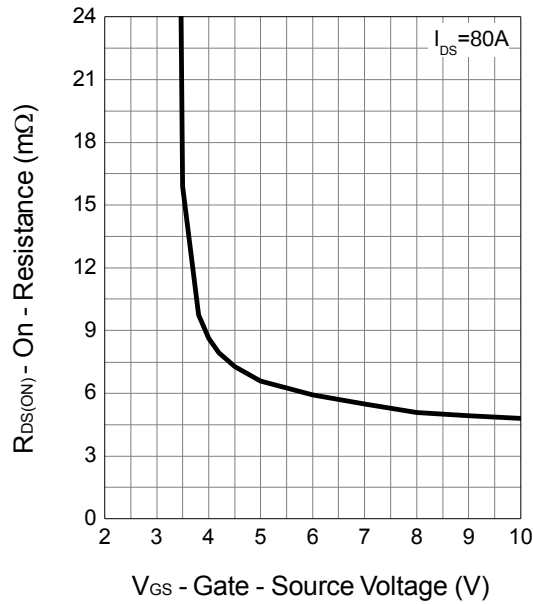
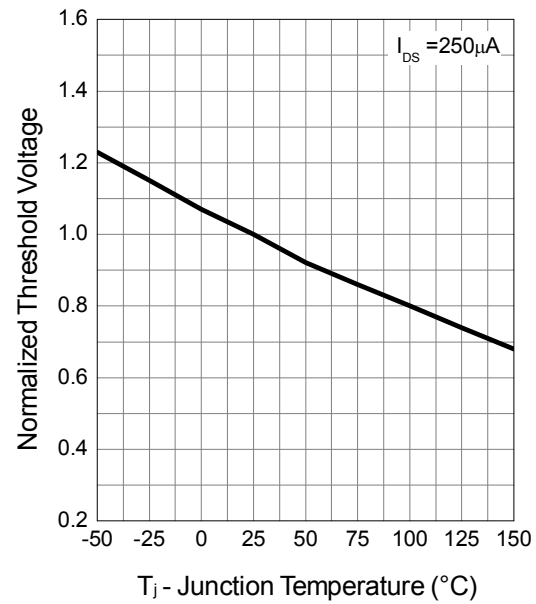
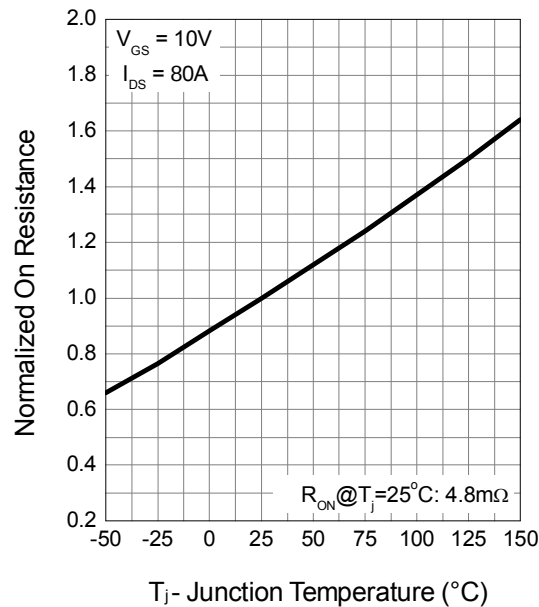
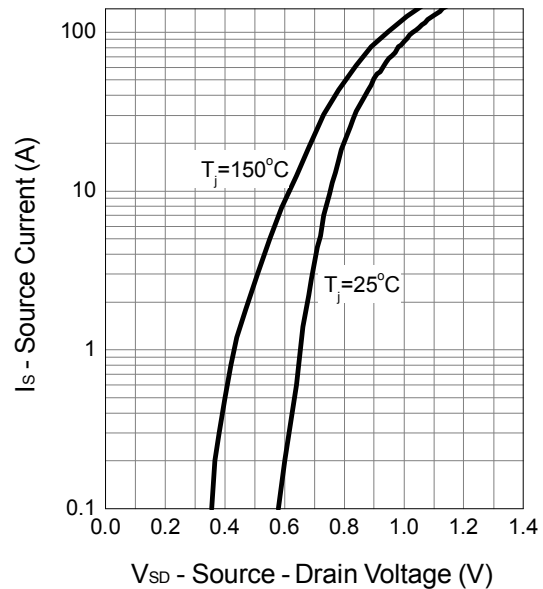
Typical Operating Characteristics



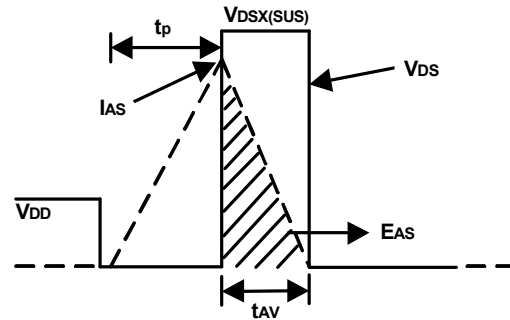
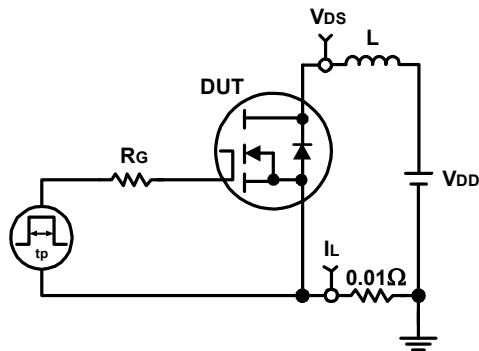
Typical Operating Characteristics (Cont.)

Output Characteristics

Drain-Source On Resistance

Capacitance

Gate Charge


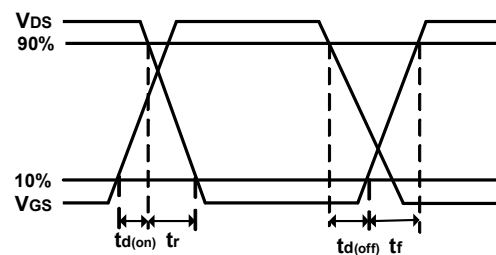
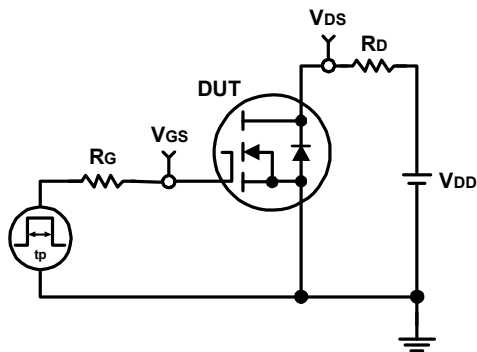
Typical Operating Characteristics (Cont.)

Gate-Source On Resistance

Gate Threshold Voltage

Drain-Source On Resistance

Source-Drain Diode Forward


Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



Package Information

