

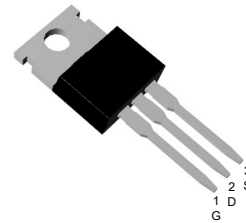
Features

- 45V/100A
 - $R_{DS(ON)} = 5.5m\Omega$ (typ.) @ $V_{GS}=10V$
 - $R_{DS(ON)} = 8m\Omega$ (typ.) @ $V_{GS}=4.5V$
- 100% UIS + R_g Tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

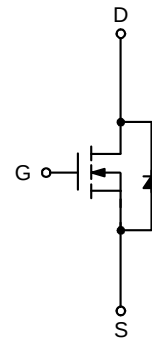
Applications

- Secondary Side Synchronous Rectification
- DC-DC Converter
- Motor Control
- Load Switching

Pin Description



Top View of TO-220



N-Channel MOSFET

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

Symbol	Parameter		Rating	Unit
Common Ratings				
V _{DSS}	Drain-Source Voltage		45	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	
I _S	Diode Continuous Forward Current	T _C =25°C	100	A
I _D	Continuous Drain Current	T _C =25°C	100	A
		T _C =100°C	75	
I _{DM} ^b	Pulsed Drain Current	T _C =25°C	300	
P _D	Maximum Power Dissipation	T _C =25°C	125	W
		T _C =100°C	50	
R _{θJC}	Thermal Resistance-Junction to Case		1	°C/W
R _{θJA} ^c	Thermal Resistance-Junction to Ambient		62.5	°C/W
I _{AS} ^d	Avalanche Current, Single pulse	L=0.5mH	30	A
E _{AS} ^d	Avalanche Energy, Single pulse	L=0.5mH	225	mJ

Note a : Current limited by bond wire.

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

Note c : Surface Mounted on 1in² pad area.

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

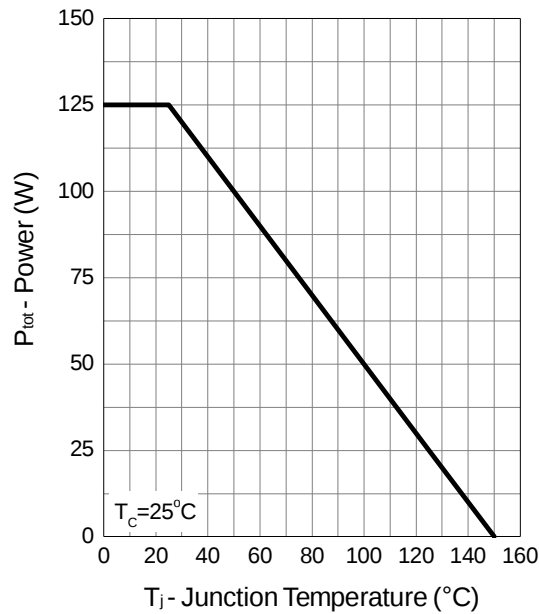
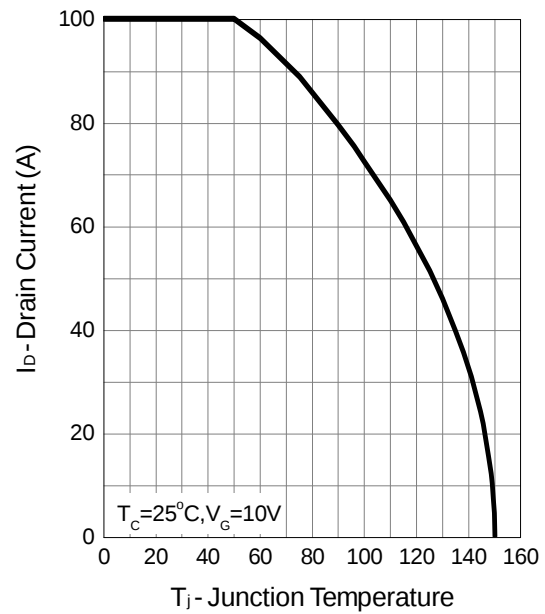
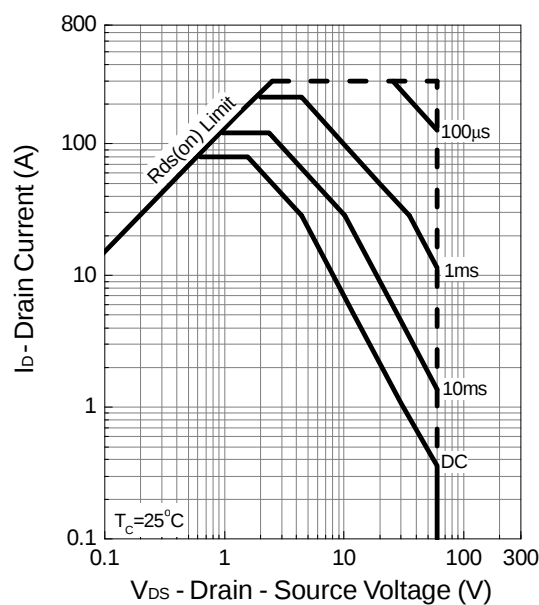
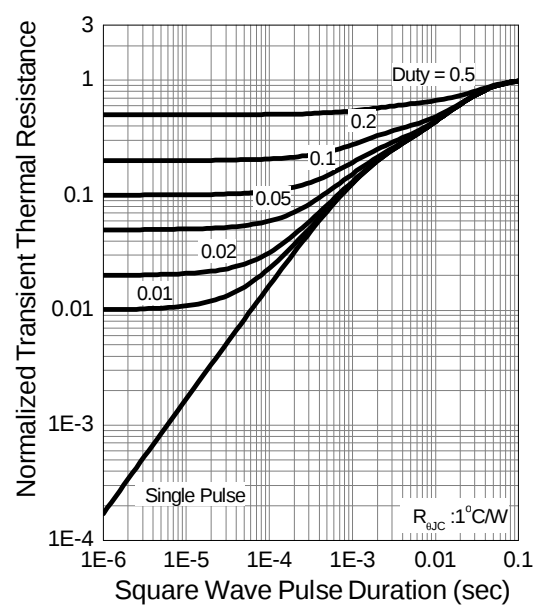
Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	45	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =36V, V _{GS} =0V T _J =85°C	-	-	1 30	μA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1	2	3	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 V _{GS} =4.5V, I _{DS} =30A	- -	5.5 8	7 10	mΩ mΩ
Diode Characteristics						
V _{SD} ^e	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	-	0.8	1.3	V
t _{rr}	Reverse Recovery Time	I _{SD} =30A, dI _{SD} /dt=100A/μs	-	33	-	ns
Q _{rr}	Reverse Recovery Charge		-	41	-	nC
Dynamic Characteristics ^f						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	-	1.0	-	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =30V, Frequency=1.0MHz	-	4350	6100	pF
C _{oss}	Output Capacitance		-	425	-	
C _{rss}	Reverse Transfer Capacitance		-	215	-	
t _{d(ON)}	Turn-on Delay Time		V _{DD} =30V, R _L =30Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	25	45
t _r	Turn-on Rise Time	-		12	22	
t _{d(OFF)}	Turn-off Delay Time	-		90	162	
t _f	Turn-off Fall Time	-		38	69	
Gate Charge Characteristics ^f						
Q _g	Total Gate Charge	V _{DS} =30V, V _{GS} =4.5V, I _{DS} =30A	-	39	-	nC
Q _g	Total Gate Charge	V _{DS} =30V, V _{GS} =10V, I _{DS} =30A	-	83	117	
Q _{gs}	Gate-Source Charge		-	17	-	
Q _{gd}	Gate-Drain Charge		-	15	-	

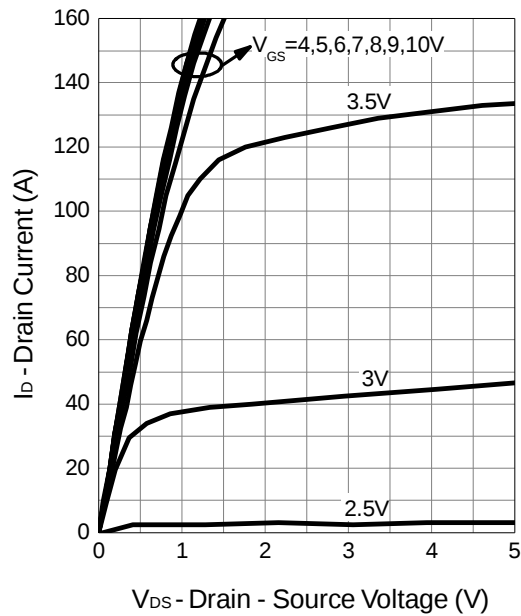
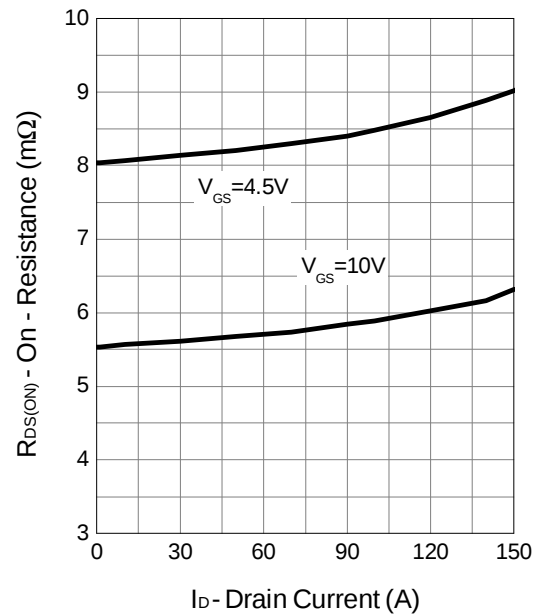
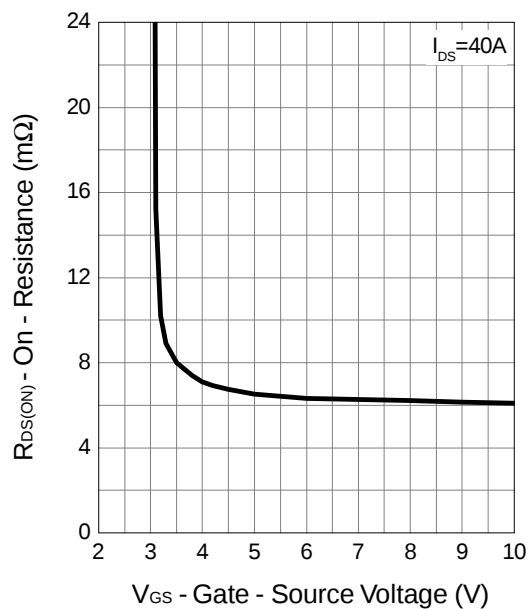
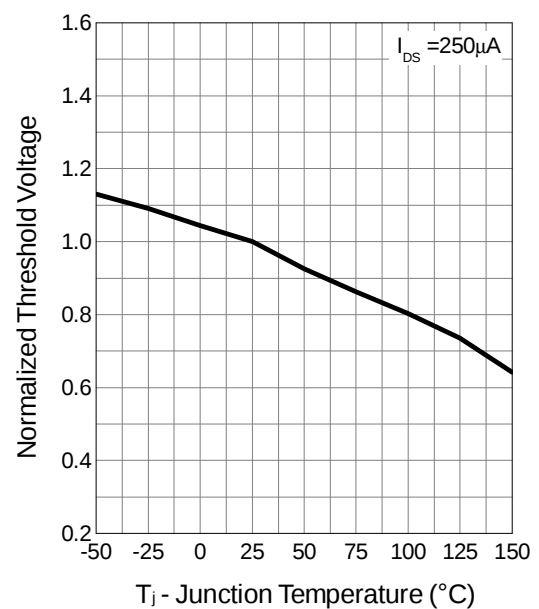
Note e : Pulse test ; pulse width≤300μs, duty cycle≤2%.

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

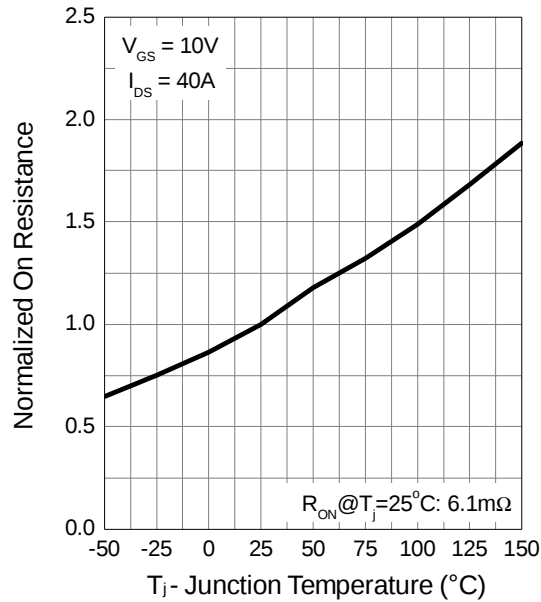
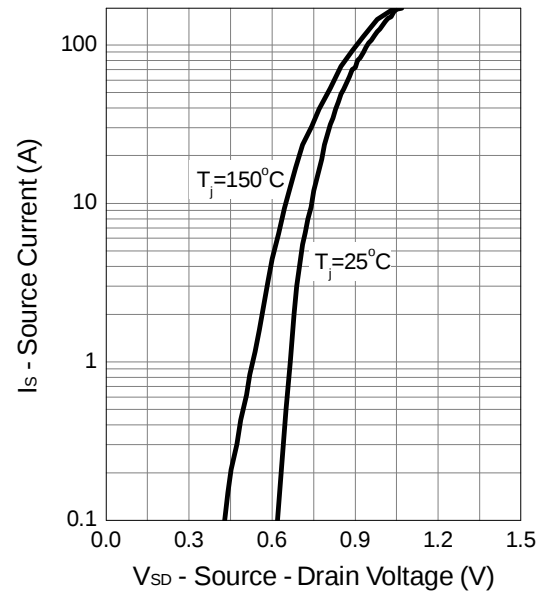
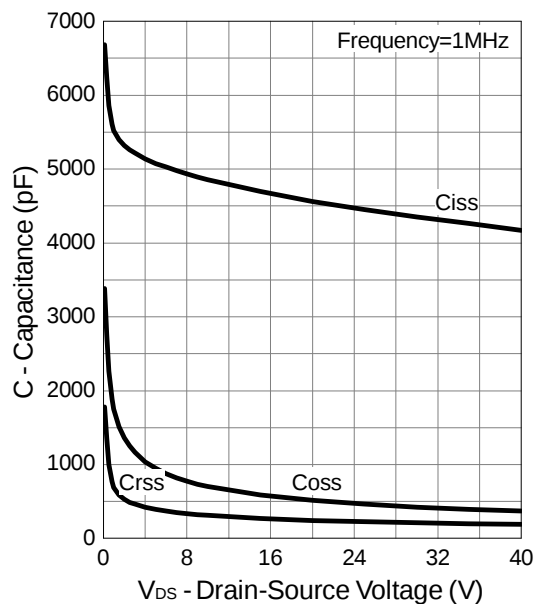
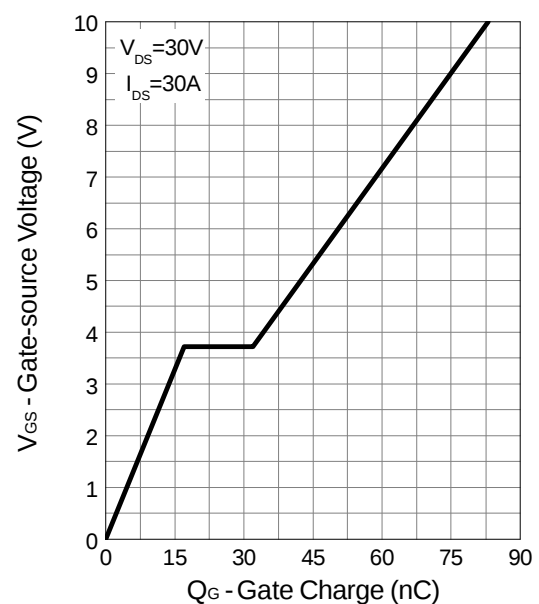
Typical Operating Characteristics

Power Dissipation

Drain Current

Safe Operation Area

Thermal Transient Impedance


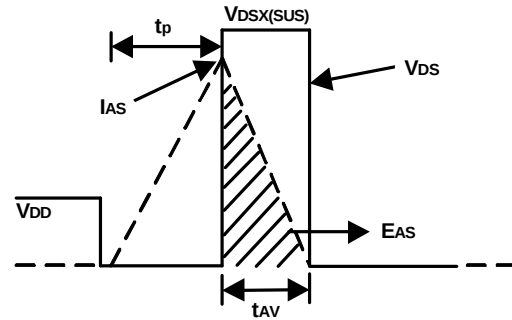
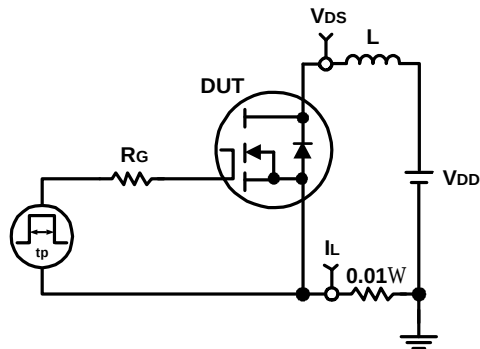
Typical Operating Characteristics (Cont.)

Output Characteristics

Drain-Source On Resistance

Gate-Source On Resistance

Gate Threshold Voltage


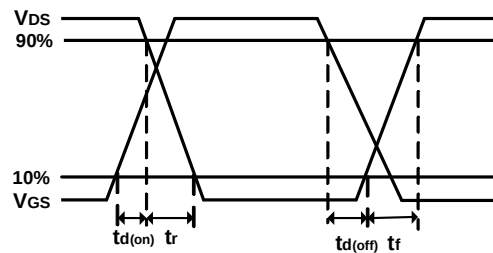
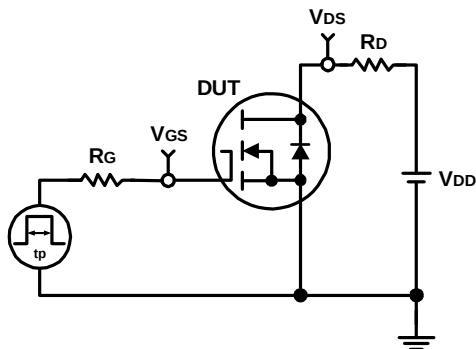
Typical Operating Characteristics (Cont.)

Drain-Source On Resistance

Source-Drain Diode Forward

Capacitance

Gate Charge


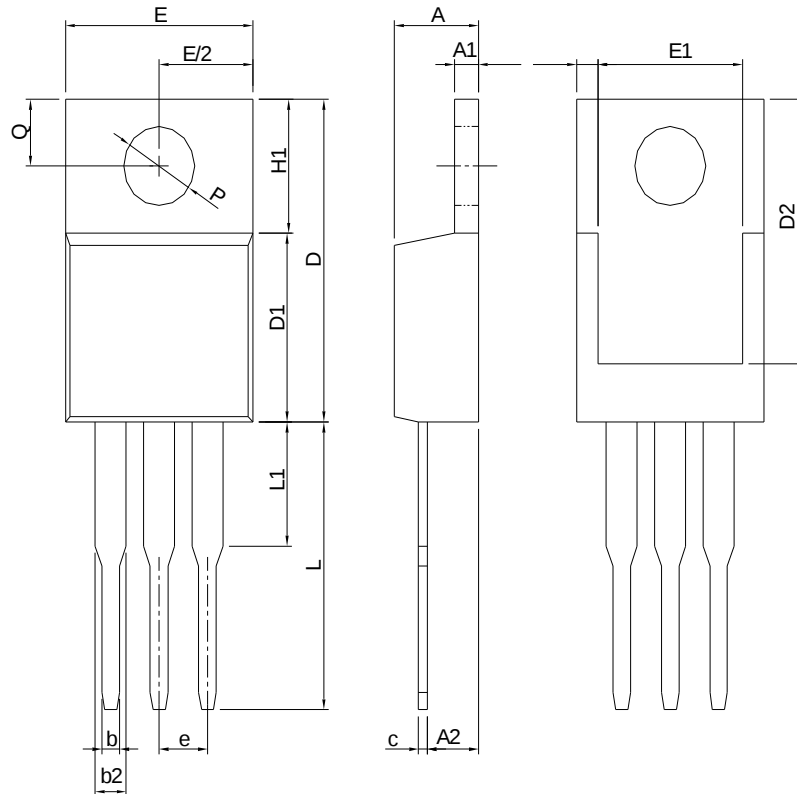
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

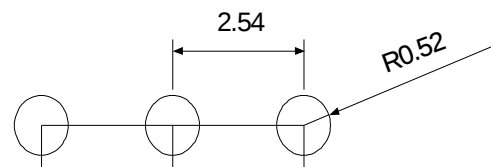


Package Information



SYMBOL	TO-220			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	3.56	4.83	0.140	0.190
A1	0.51	1.40	0.020	0.055
A2	2.03	2.92	0.080	0.115
b	0.38	1.02	0.015	0.040
b2	1.14	1.78	0.045	0.070
c	0.36	0.61	0.014	0.024
D	14.22	16.51	0.560	0.650
D1	8.38	9.30	0.330	0.366
D2	12.19	13.65	0.480	0.537
E	9.65	10.67	0.380	0.420
E1	6.86	8.89	0.270	0.350
e	2.54 BSC		0.100 BSC	
H1	5.84	6.86	0.230	0.270
L	12.70	14.73	0.500	0.580
L1	-	6.35	-	0.250
P	3.53	4.09	0.139	0.161
Q	2.54	3.43	0.100	0.135

RECOMMENDED LAND PATTERN



UNIT: mm

Note: Follow JEDEC TO-220 AB.