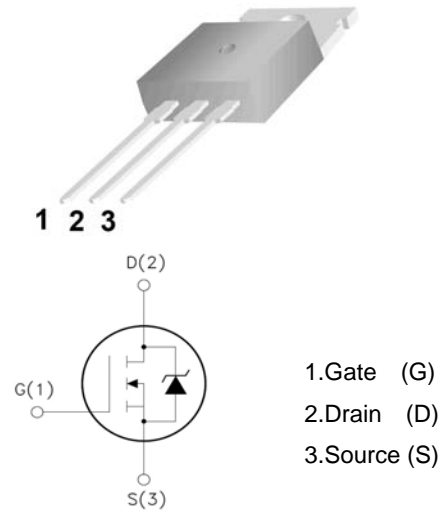


TO-220


Features:

- Low Intrinsic Capacitances.
- Excellent Switching Characteristics.
- Extended Safe Operating Area.
- Unrivalled Gate Charge :Qg= 190nC (Typ.).
- BVDSS=40V, I_D=230A
- R_{DS(on)} : 2.3mΩ (Typ.) @V_G=10V
- 100% Avalanche Tested


Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Symbol	Parameter	Maximum	Unit
V _{DSS}	Drain-to-Source Voltage	40	V
V _{GSS}	Gate-to-Source Voltage	±20	V
I _D ³	Continuous Drain Current	T _C =25°C	230
		T _C =100°C	162
I _{DP} ⁴	Pulsed Drain Current	T _C =25°C	800
I _{AS} ⁵	Avalanche Current	33	A
EAS ⁵	Avalanche energy	1.5	J
PD	Maximum Power Dissipation	T _C =25°C	285
		T _C =100°C	145
T _J , T _{STG}	Junction & Storage Temperature Range	-55~175	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
Rθ _{jc}	Thermal Resistance-Junction to Case	0.52	°C/W
Rθ _{ja}	Thermal Resistance-Junction to Ambient	62.5	

Electrical Characteristics (TA=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 _D =250uA	40	—	—	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =32V, V _{GS} =0V	—	—	1	uA
		T _J =125°C	—	—	10	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	2	3	4	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	—	—	±100	nA
R _{DS(on)} ¹	Drain-Source On-Resistance	V _{GS} =10V, I _D =60A	—	2.3	4	mΩ
			—	—	—	
Diode Characteristics						
V _{SD} ¹	Diode Forward Voltage	I _{SD} =60A, V _{GS} =0V	—	—	1.3	V
I _S ³	Diode Continuous Forward Current		—	—	250	A
t _{rr}	Reverse Recovery Time	I _F =60A,	—	37	—	nS
Q _{rr}	Reverse Recovery Charge	di/dt=100A/us	—	62	—	nC
Dynamic Characteristics ²						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Frequency=1MHz	—	1	—	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =25V Frequency=1MHz	—	7000	—	pF
C _{oss}	Output Capacitance		—	1850	—	
C _{riss}	Reverse Transfer Capacitance		—	675	—	
t _{d(on)}	Turn-On Delay Time	V _{DD} =30V, I _D =60A, V _{GS} =10V, R _G =6Ω	—	35	—	nS
t _r	Turn-On Rise Time		—	20	—	
t _{d(off)}	Turn-Off Delay Time		—	45	—	
t _f	Turn-Off Fall Time		—	62	—	
Gate Charge Characteristics ²						
Q _g	Total Gate Charge	V _{DS} =32V, V _{GS} =10V I _D =60A	—	190	—	nC
Q _{gs}	Gate-to-Source Charge		—	30	—	
Q _{gd}	Gate-to-Drain Charge		—	80	—	

Note: 1: Pulse test; pulse width ≤ 300us, duty cycle ≤ 2%.

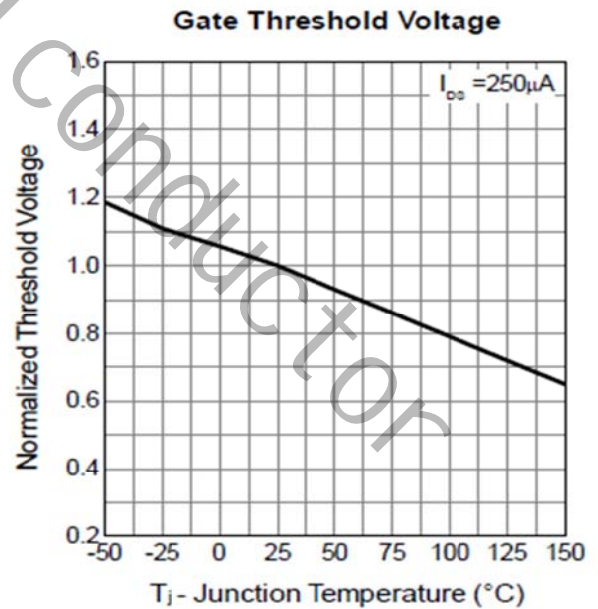
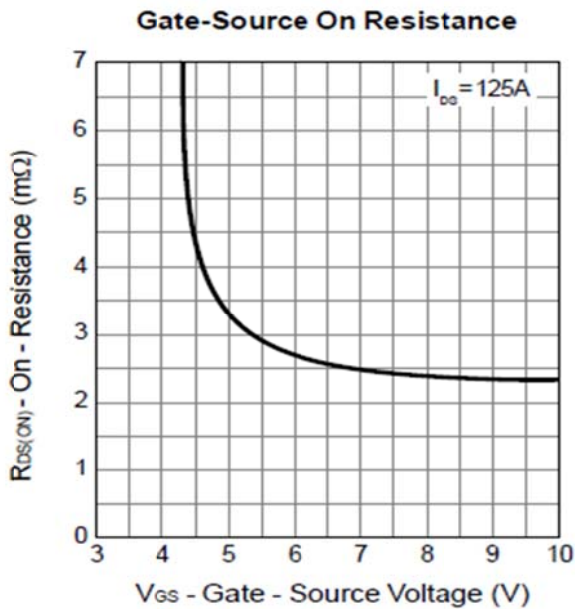
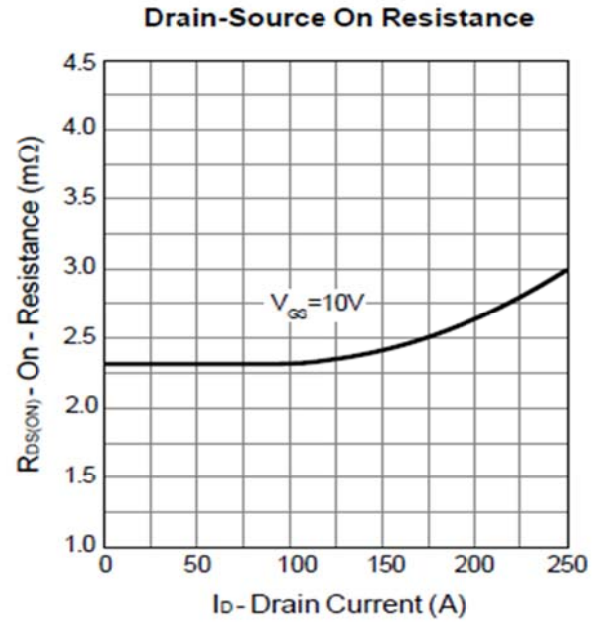
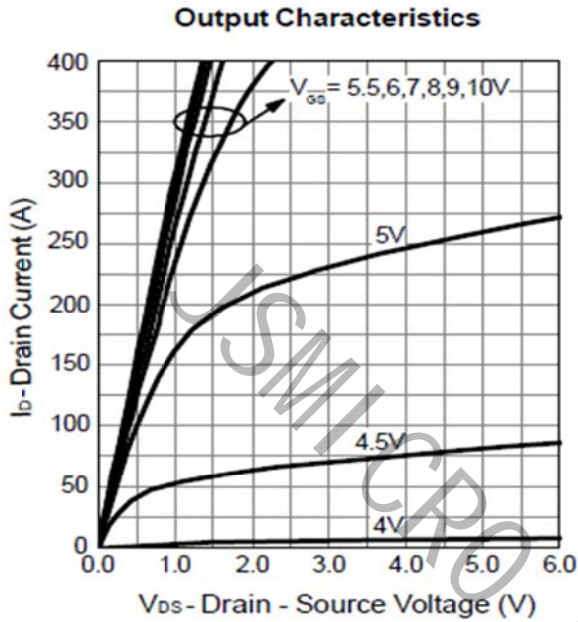
2: Guaranteed by design, not subject to production testing.

3: Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 55A.

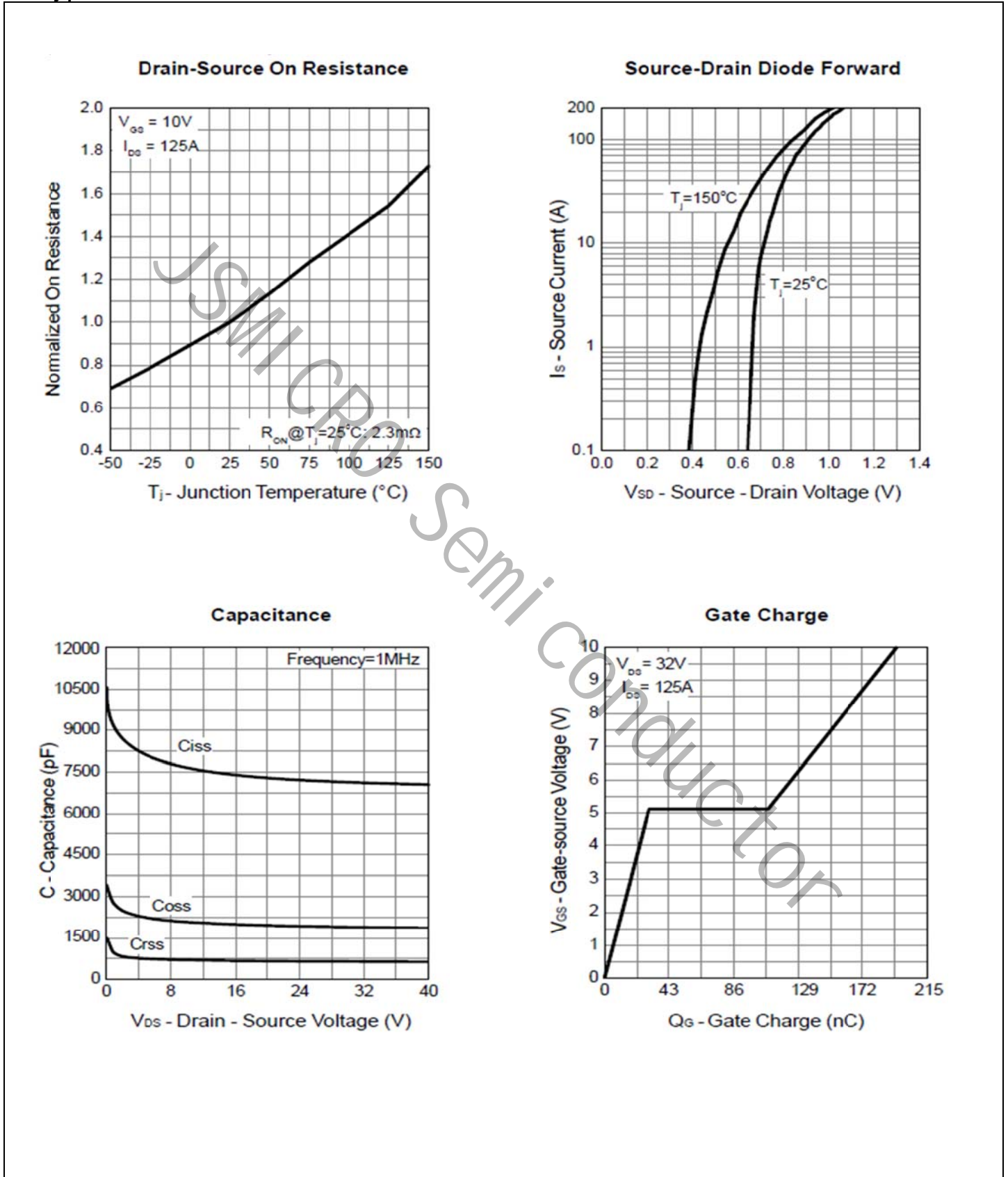
4: Repetitive rating, pulse width limited by max junction temperature.

5: Starting T_J = 25°C, L = 1mH

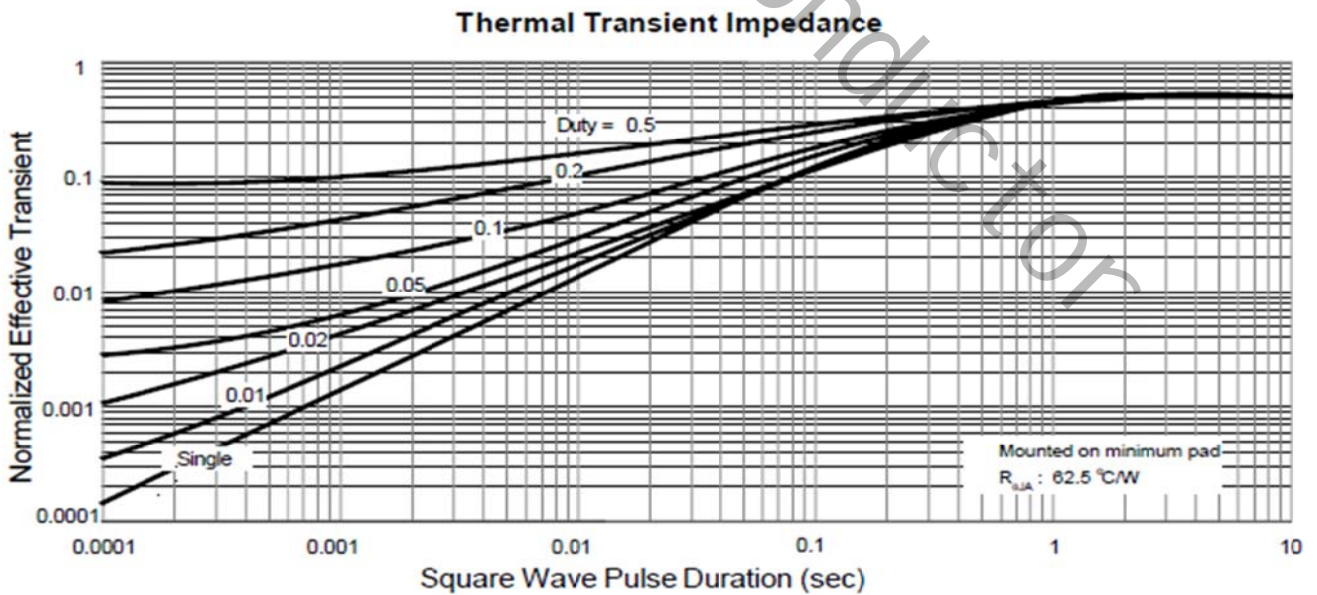
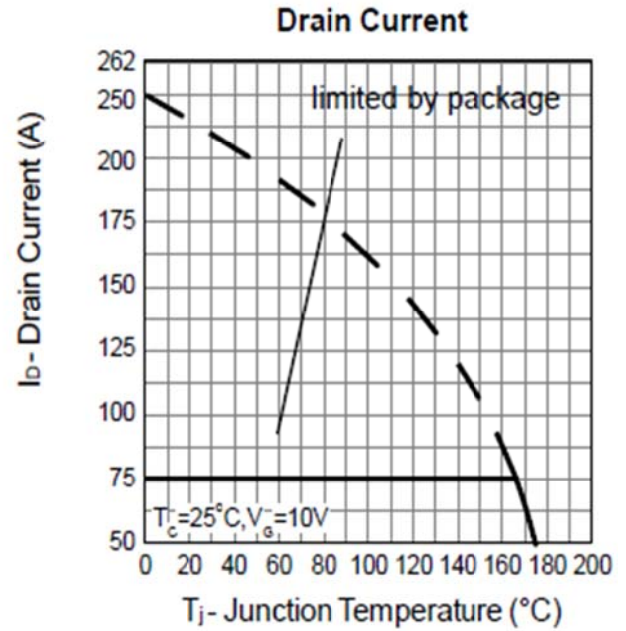
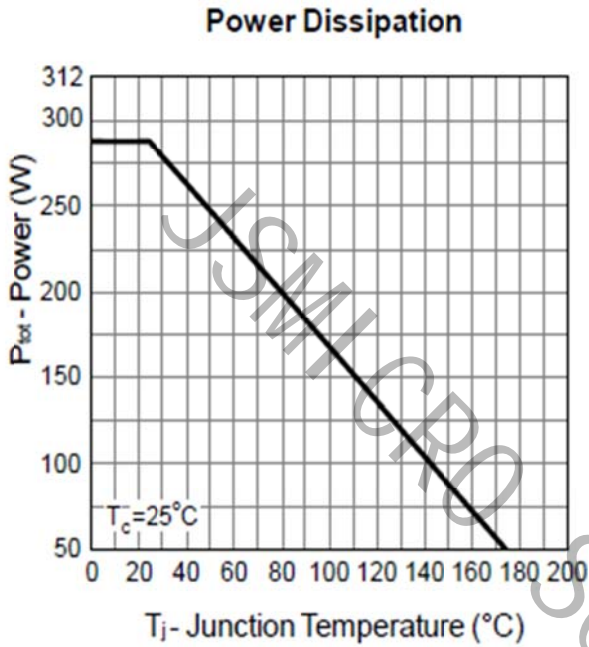
Typical Characteristics



Typical Characteristics (Continued)



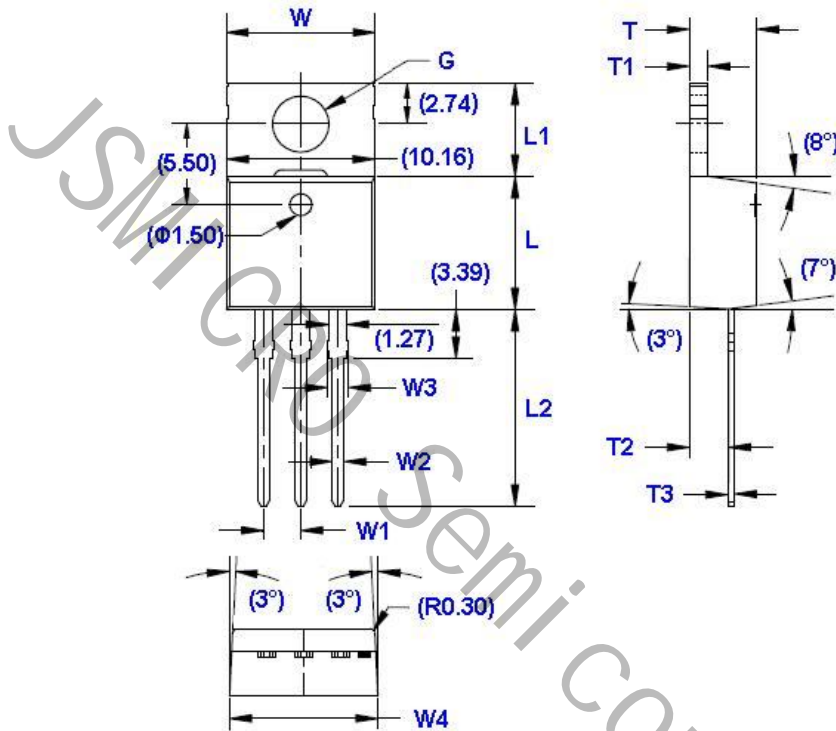
Typical Characteristics (Continued)



Package Dimension

TO-220W

Unit: mm



Symbol	Size		Symbol	Size		Symbol	Size	
	Min	Max		Min	Max		Min	Max
W	10.00	10.40	L	8.86	9.26	T2	2.46	2.86
W1	2.54 (TYP)		L1	6.09	6.49	T3	0.28	0.48
W2	0.71	0.91	L2	13.25	13.65	G (Φ)	3.73	3.93
W3	1.14	1.54	T	4.40	4.80			
W4	9.96	10.36	T1	1.14	1.40			