

650V N-Channel Power MOSFET

Features

- High Voltage: $BV_{DSS}=650V(\text{Min.})$
- I_D : 10A
- Robust high voltage termination
- Avalanche energy specified
- Fast diode recovery time

Application

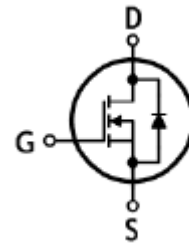
- Ballast Bridge
- Switch Mode Power Supplier
- Power Factor Correction
- Lighting



TO-262

Pin Definition

1. Gate
2. Drain
3. Source



Ordering Information

Type NO	Marking	Package Code
WMC10N65S	10N65C	TO-262

Absolute maximum ratings ($T_C=25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Rating	Unit	
Drain-source voltage	V_{DSS}	650	V	
Gate-source voltage	V_{GSS}	± 20	V	
Drain current (DC)	I_D	$T_C=25^\circ\text{C}$	10	A
		$T_C=100^\circ\text{C}$	6	A
Drain current (Pulsed) ①	I_{DM}	40	A	
Single avalanche energy ②	E_{AS}	500	mJ	
Power dissipation	P_D	126	W	
Junction temperature	T_J	150	$^\circ\text{C}$	
Storage temperature range	T_{stg}	-55~150	$^\circ\text{C}$	

* Limited by maximum junction temperature

Characteristic	Symbol	Max	Unit
Thermal resistance	Junction-case	1.0	$^\circ\text{C}/\text{W}$
	Junction-ambient	62.5	

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

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV _{DSS}	I _D =250 μA, V _{GS} =0V	650	-	-	V
Gate threshold voltage	V _{GS(th)}	I _D =250 μA, V _{DS} = V _{GS}	2.0	-	4.0	V
Drain-source cut-off current	I _{DSS}	V _{DS} =600V, V _{GS} =0V, T _C =25°C	-	-	1	μA
		V _{DS} =480V, V _{GS} =0V, T _C =125°C	-	-	10	μA
Gate leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V	-	-	±0.1	μA
Drain-source on-resistance ③	R _{DS(on)}	V _{GS} =10V, I _D =5A	-	0.75	0.9	Ω
Forward transfer conductance ③	g _{fs}	V _{DS} =40V, I _D =5A	-	8	-	S
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V f=1 MHz	-	1840	-	pF
Output capacitance	C _{oss}		-	154	-	
Reverse transfer capacitance	C _{rss}		-	9	-	
Turn-off delay time ③	t _{d(off)}	V _{DD} =300V, I _D =10A R _G =25Ω	-	130	-	ns
Total gate charge ③	Q _g	V _{DD} =480V, V _{GS} =10V I _D =10A	-	45	-	nC
Gate-source charge ③	Q _{gs}		-	7.5	-	
Gate-drain charge ③	Q _{gd}		-	18.5	-	

Source-Drain Diode Ratings and Characteristics (T_C=25°C unless otherwise noted)

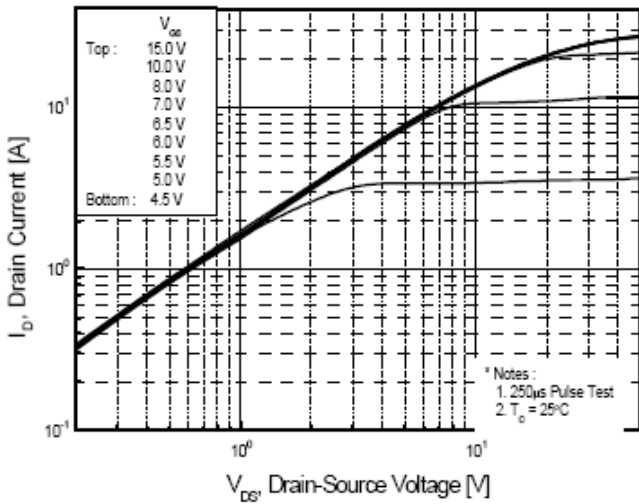
Characteristic	Symbol	Test Condition	Min	Typ	Max	Unit
Source current (DC)	I _S	-	-	-	10	A
Forward voltage ③	V _{SD}	V _{GS} =0V, I _{SD} =10A	-	-	1.4	V
Reverse recovery time ③	t _{rr}	I _{SD} =10A, V _{GS} =0V dI _F /dt=100A/μs	-	420	-	ns
Reverse recovery charge ③	Q _{rr}		-	4.2	-	μC

Note ;

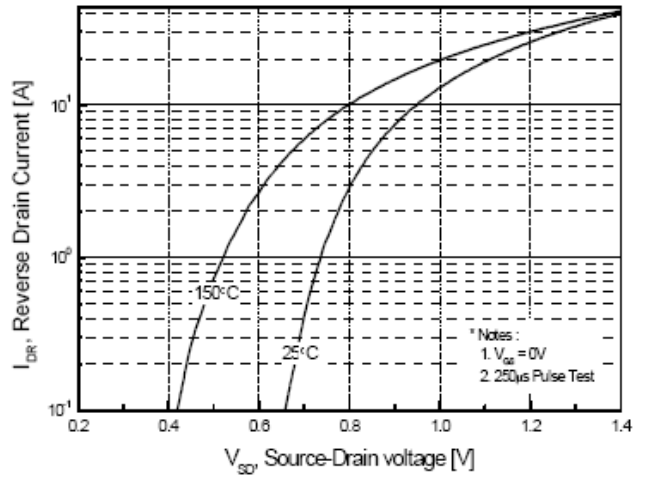
1. Repetitive rating: Pulse width limited by maximum junction temperature
2. Starting T_j=25°C, V_{DD} =50V, L=10mH, R_G =25Ω, I_{AS}=10A
3. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%

Electrical Characteristic Curves

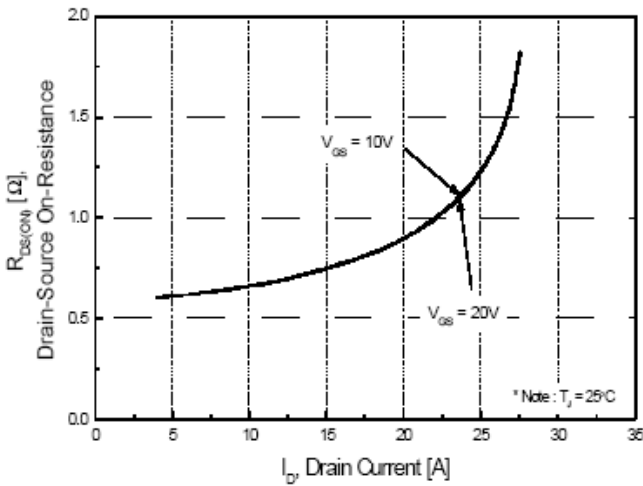
Typical Output Characteristics



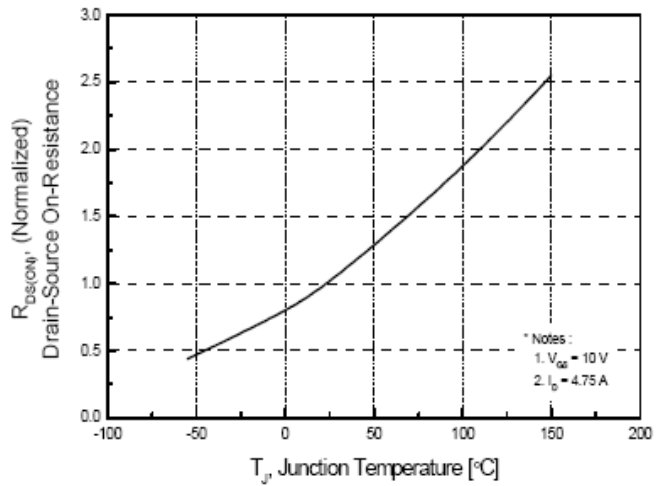
Typical Source-Drain Diode Forward Voltage



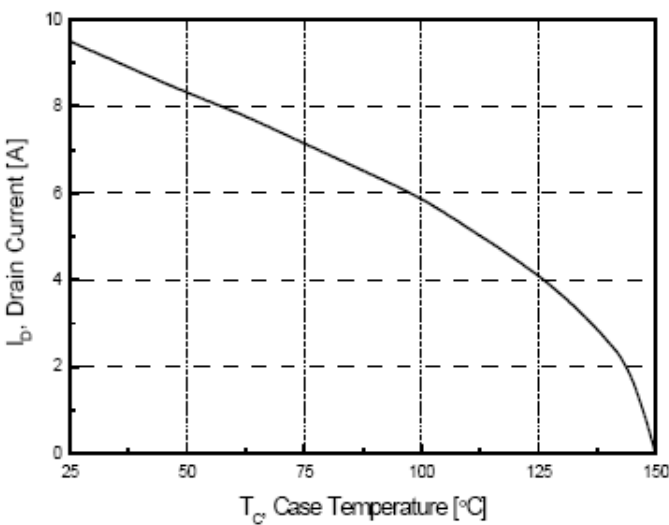
On-Resistance vs. Drain Current and Gate Voltage



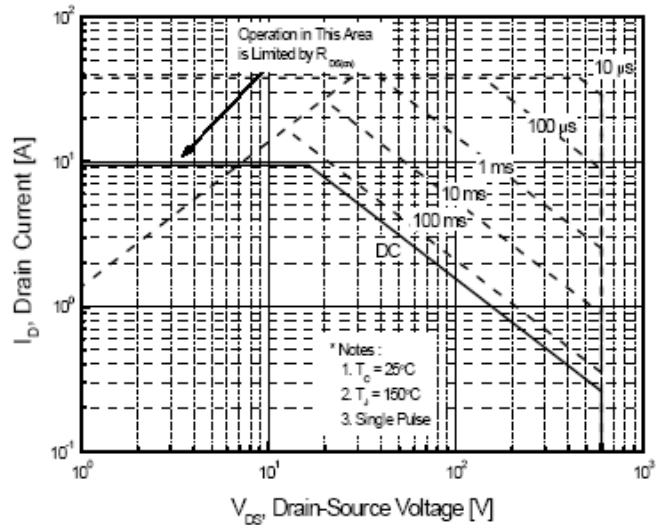
Normalized On-Resistance vs. Junction Temperature



Maximum Drain Current vs. Case Temperature

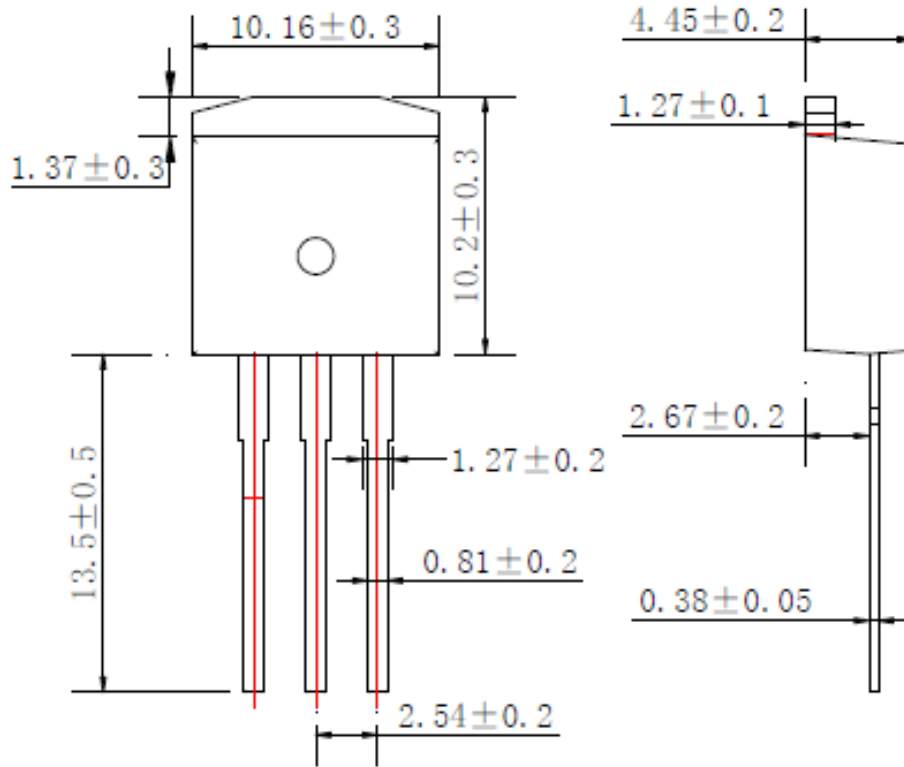


Maximum Safe Operating Area

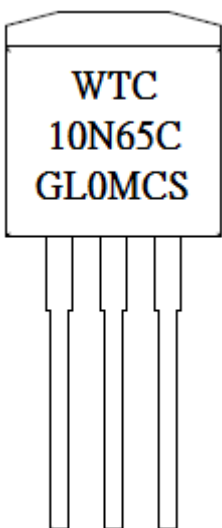


Outline Dimension : TO-262

Unit : mm



Marking Diagram



First Line	WTC	Company Name	
Second Line	10N65C	Product Code	
Third Line	GL0MCS	1st (Year Code)	A-2010 B-2011 C-2012 ...
		2nd (Month Code)	A-Jan B-Feb C-Mar D-Apr E-May F-Jun G-Jul H-Aug I-Sep J-Oct K- Nov L-Dec
		3rd (Lot Code)	0-1 , A-9
		4th (Product Code)	M-MOS , T-Transistor
		5th (Package Code)	C-TO-262 , I-TO-251 , F-TO220F
		6th (Spec Code)	Assembly Code