WTC

Winsem Technology Corp.

WMI7N65AZ
POWER MOSFET

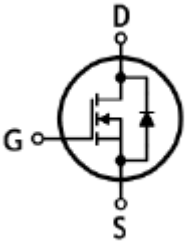
650V N-Channel Power MOSFET

Features

- High Voltage: BV_{DSS}=650V(Min.)
- I_D : 6.5A
- Robust high voltage termination
- Avalanche energy specified
- Fast diode recovery time

G D S

I-PAK (Short Lead)



Application

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

Ordering Information

Type NO	Marking	Package Code
WMI7N65AZ	7N65AZ	TO-251

Absolute maximum ratings (T_C=25°C unless otherwise noted)

Characteristic	Symbol		Rating	Unit
Drain-source voltage	V_{DSS}		650	V
Gate-source voltage	V_{GSS}		±30	V
Drain current (DC) *	I_D	(Tc=25℃)	6.5	A
		(Tc=100℃)	3.7	A
Drain current (Pulsed) *	I_{DM}		26.0	A
Power dissipation	P_D	T_C = 25 ℃	120	W
		Derate above 25 ℃	0.96	W
Single pulsed avalanche energy	E_{AS}		420	mJ
Avalanche current (Repetitive) ①	I_{AR}		6.5	A
Repetitive avalanche energy ①	E_{AR}		12	mJ
Junction temperature and Storage temperature range	T_J & T_{stg}		-55~150	℃
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	T_L		300	℃

* Limited by maximum junction temperature

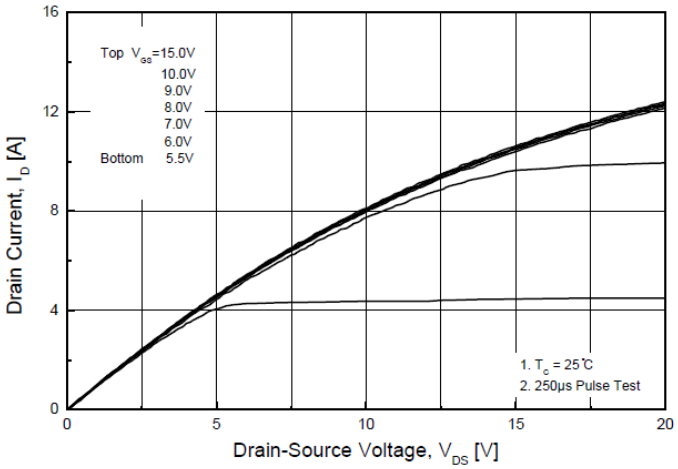
Thermal Characteristics

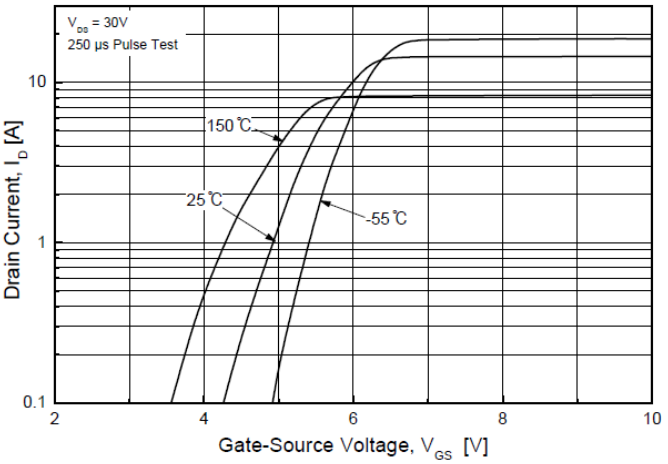
Parameter	Symbol	Rating	Unit
Maximum Thermal resistance, Junction-to-Case	$R_{\theta JC}$	1.04	℃/W
Maximum Thermal resistance, Junction-to-Ambient	$R_{\theta JA}$	110	℃/W

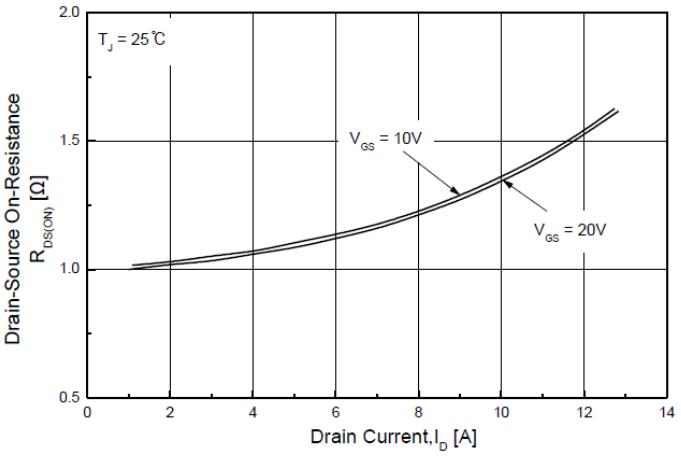
Electrical Characteristics : T_C=25°C, unless otherwise noted

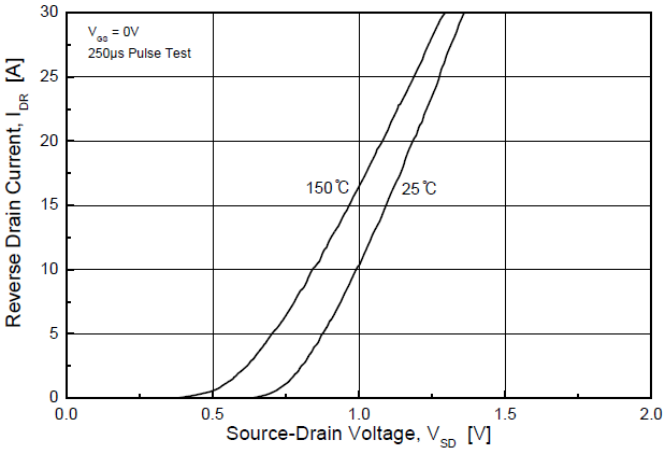
Parameter	Symbol	Test condition	Min	Typ	Max	Units
OFF						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = 250 µA	650	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 650 V, V_{GS} = 0 V	--	--	1	µA
		V_{DS} = 520 V, T_C = 125°C	--	--	10	µA
Forward Gate-Source Leakage Current	I_{GSSF}	V_{GS} = 30 V, V_{DS} = 0 V	--	--	100	µA
Reverse Gate-Source Leakage Current	I_{GSSR}	V_{GS} = -30 V, V_{DS} = 0 V	--	--	-100	µA
ON						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	3	--	5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 3.25 A	--	1.2	1.4	Ω
Forward Transconductance (Note 4)	g_{FS}	V_{DS} = 30 V, I_D = 3.25 A	--	8	--	S
DYNAMIC						
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz	--	1201	--	pF
Output Capacitance	C_{oss}		--	100	--	pF
Reverse Transfer Capacitance	C_{rss}		--	12	--	pF
SWITCHING						
Turn-On Delay Time (Note 4,5)	$t_{d(on)}$	V_{DD} = 325 V, I_D = 6.5 A, R_G = 25 Ω	--	30	--	ns
Turn-On Rise Time (Note 4,5)	t_r		--	33	--	ns
Turn-Off Delay Time (Note 4,5)	$t_{d(off)}$		--	126	--	ns
Turn-Off Fall Time (Note 4,5)	t_f		--	32	--	ns
Total Gate Charge (Note 4,5)	Q_g	V_{DS} = 520V, I_D = 6.5 A, V_{GS} = 10 V	--	27	--	nC
Gate-Source Charge (Note 4,5)	Q_{gs}		--	5	--	nC
Gate-Drain Charge (Note 4,5)	Q_{gd}		--	12	--	nC
SOURCE DRAIN DIODE						
Maximum Continuous Drain-Source Diode Forward Current	I_S	----	--	--	6.5	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	----	--	--	26	A
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 6.5 A	--	--	1.5	V
Reverse Recovery Time (Note 4)	t_{rr}	V_{GS} = 0 V, I_S = 6.5 A, dI_F / dt = 100 A/µs	--	418	--	ns
Reverse Recovery Charge (Note 4)	Q_{rr}		--	3.3	--	µC

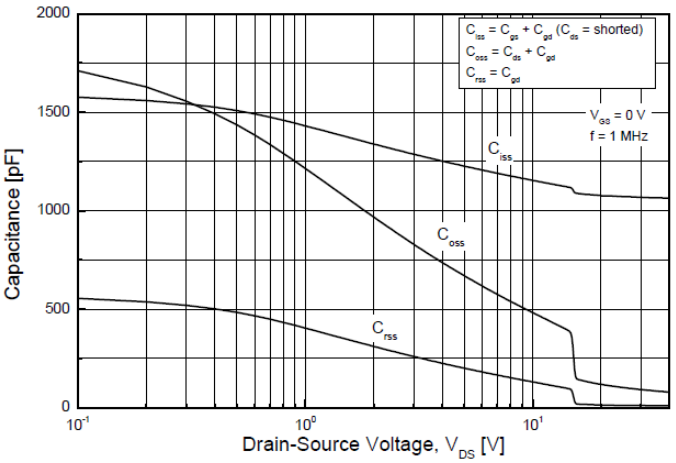
Note :
1. Repeated rating : Pulse width limited by safe operating area
2. L=17.1mH, I_{AS} = 6.5A, V_{DD} = 50V, R_G = 25Ω, Starting T_J= 25 ℃
3 I_{SD} ≤ 6.5A, di/dt ≤ 200A/µs , V_{DD} ≤ BV_{DS}, Starting T_J= 25 ℃
4. Pulse Test :Pulse width ≤ 300µs, Duty Cycle ≤ 2%
5. Essentially Independent of Operating Temperature Typical Characteristics

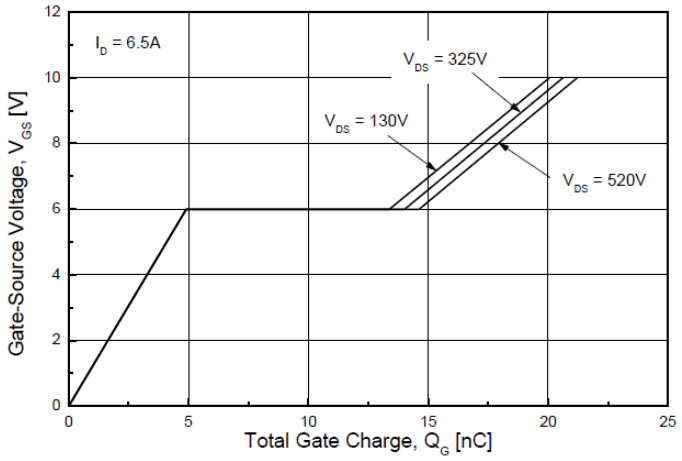

Top V_GS=15.0V
10.0V
9.0V
8.0V
7.0V
6.0V
Bottom 5.5V
1. T_C = 25℃
2. 250μs Pulse Test
Drain Current, I_D [A]
Drain-Source Voltage, V_DS [V]

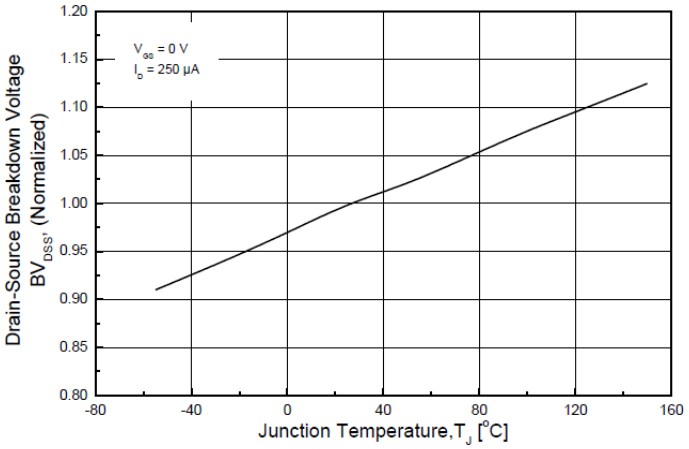

V_DS = 30V
250 μs Pulse Test
150℃
25℃
-55℃
Drain Current, I_D [A]
Gate-Source Voltage, V_GS [V]

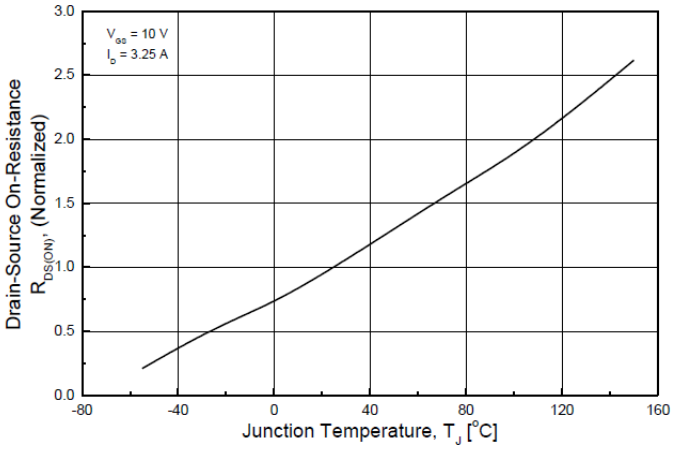

T_J = 25℃
V_GS = 10V
V_GS = 20V
Drain-Source On-Resistance
R_DS(ON) [Ω]
Drain Current, I_D [A]

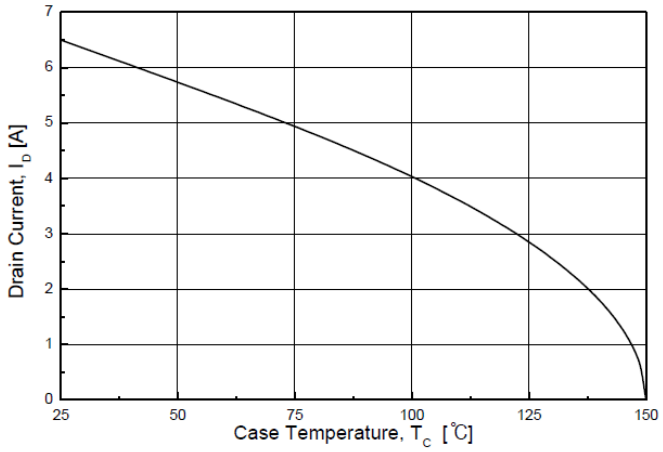

V_GS = 0V
250μs Pulse Test
150℃
25℃
Reverse Drain Current, I_DR [A]
Source-Drain Voltage, V_SD [V]

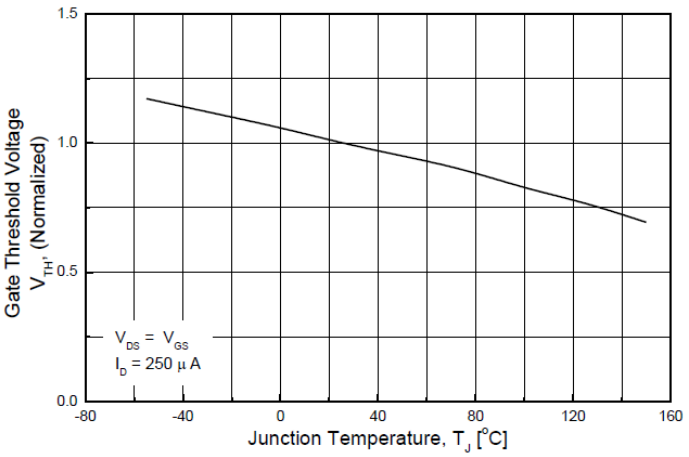

C_iss = C_gs + C_gd (C_ds = shorted)
C_oss = C_ds + C_gd
C_rss = C_gd
V_GS = 0 V
f = 1 MHz
C_iss
C_oss
C_rss
Capacitance [pF]
Drain-Source Voltage, V_DS [V]

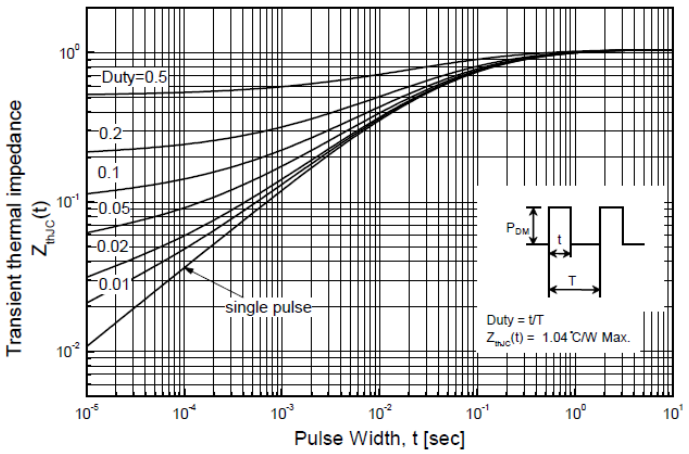

I_D = 6.5A
V_DS = 325V
V_DS = 130V
V_DS = 520V
Gate-Source Voltage, V_GS [V]
Total Gate Charge, Q_G [nC]

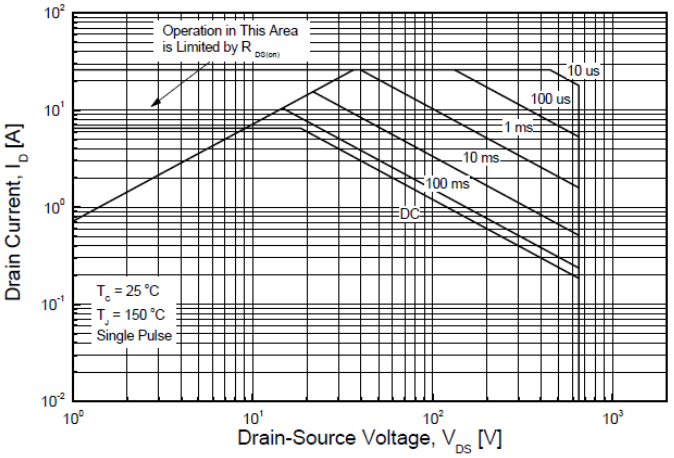

Drain-Source Breakdown Voltage
BV_{DSS}, (Normalized)
V_{GS} = 0 V
I_D = 250 μA
Junction Temperature,T_J [°C]


Drain-Source On-Resistance
$R_{DS(ON)}$, (Normalized)
V_{GS} = 10 V
I_D = 3.25 A
Junction Temperature, T_J [°C]


Drain Current, I_D [A]
Case Temperature, T_C [℃]

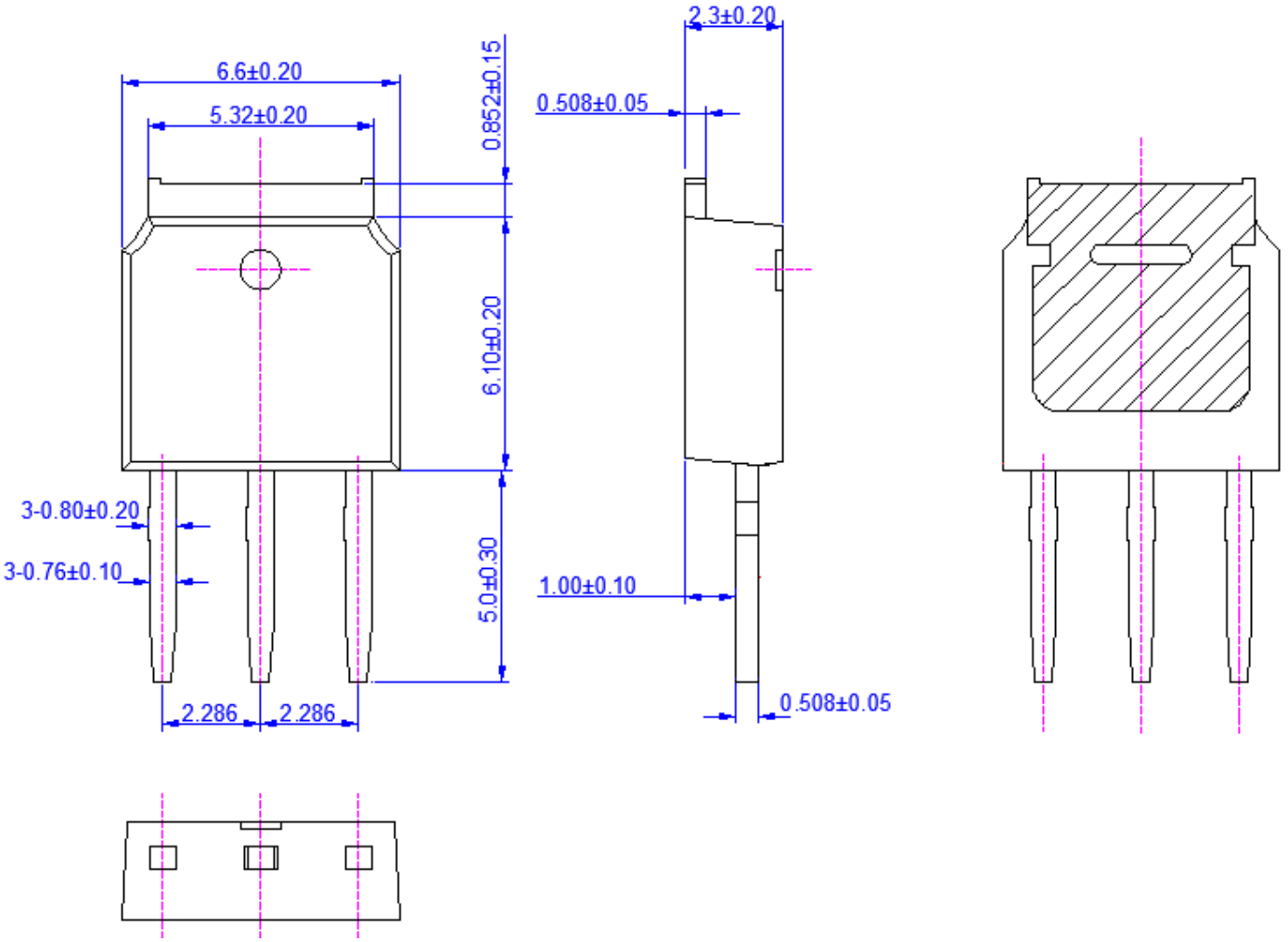

Gate Threshold Voltage
V_{TH}, (Normalized)
V_{DS} = V_{GS}
I_D = 250 μ A
Junction Temperature, T_J [°C]

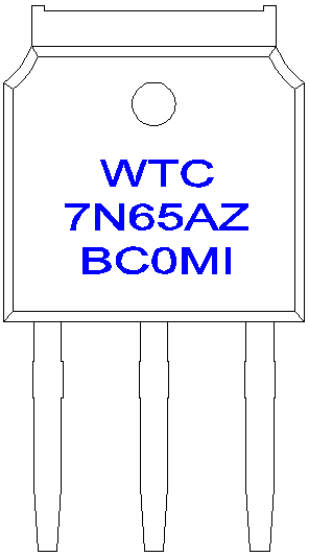

Transient thermal impedance
$Z_{thJC}(t)$
Duty=0.5
0.2
0.1
0.05
0.02
0.01
single pulse
P_{DM}
t
T
Duty = t/T
$Z_{thJC}(t)$ = 1.04℃/W Max.
Pulse Width, t [sec]


Operation in This Area
is Limited by $R_{DS(on)}$
10 us
100 us
1 ms
10 ms
100 ms
DC
T_c = 25 °C
T_j = 150 °C
Single Pulse
Drain Current, I_D [A]
Drain-Source Voltage, V_{DS} [V]

Outline Dimension

unit: mm





First Line	WTC	Company Name	
Second Line	7N65AZ	Product Code	
Third Line	BC0MI	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-Transsistor
		5th (Package Code)	D-TO-252 , I-TO-251
		6th (Spec Code)	(Reserve)