

Description:

This N+P Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge.

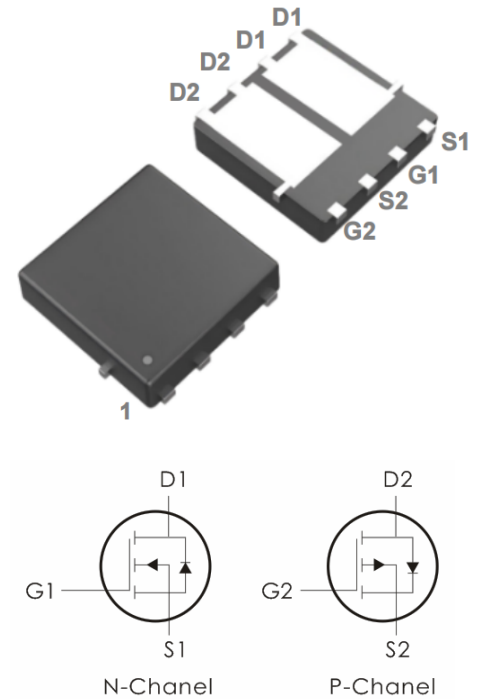
It can be used in a wide variety of applications.

Features:

N-Channel: $V_{DS}=30V, I_D=10A, R_{DS(on)} < 13m\Omega @ V_{GS}=10V$

P-Channel: $V_{DS}=-30V, I_D=-12A, R_{DS(on)} < 25m\Omega @ V_{GS}=-10V$

- 1) Low gate charge.
- 2) Green device available.
- 3) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 4) Excellent package for good heat dissipation.



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
DOZ4616	Z4616	DFN3*3-8D	5000 pcs/Reel

Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	N-Channel	P-Channel	Units
V_{DS}	Drain-Source Voltage	30	-30	V
V_{GS}	Gate-Source Voltage	± 20	± 20	V
I_D	Continuous Drain Current- $T_C=25^\circ C$	10	-12	A
	Continuous Drain Current- $T_C=100^\circ C$	6.8	-7.2	
I_{DM}	Pulsed Drain Current ^{note1}	42	-44	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}	20	25	mJ
P_D	Power Dissipation - $T_C=25^\circ C$	3.3	5.6	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150		$^\circ C$

Thermal Characteristics:

Symbol	Parameter	N-CH	P-CH	Units
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	38	22	$^\circ C/W$

N-Channel Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Sourctce Breakdown Voltage	V _{GS} =0V,I _D =250 μ A	30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =30V	---	---	1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics ³						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1	1.4	2.5	V
R _{DS(ON)}	Drain-Source On Resistance ^{note3}	V _{GS} =10V,I _D =10A	---	11	13	m Ω
		V _{GS} =4.5V,I _D =5A	---	15	21	
Dynamic Characteristics ⁴						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	580	---	pF
C _{oss}	Output Capacitance		---	110	---	
C _{rss}	Reverse Transfer Capacitance		---	92	---	
Q _g	Gate Charge	V _{GS} =10V V _{DS} =15V I _D =10A	---	13	---	nC
Q _{gs}	Gate-Source Charge		---	4.5	---	
Q _{gd}	Gate-Drain Charge		---	3.3	---	
Switching Characteristics ⁴						
t _{d(on)}	Turn-On Delay Time	V _{DS} =30V, I _D = 10A, R _{REN} =3 Ω ,V _{GS} =10V	---	3	---	ns
t _r	Rise Time		---	6	---	ns
t _{d(off)}	Turn-Off Delay Time		---	19	---	ns
t _f	Fall Time		---	5	---	ns
Drain-Source Diode Characteristics						
I _S	Continuous Drain to Source Diode	VD=VG=0V	---	----	10	A
I _{SM}	Pulsed Drain to Source Diode	VD=VG=0V	---	---	42	A

V_{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =11A	---	0.8	1.2	V
t_{rr}	Body Diode Reverse Recovery Time	I _F =11A, di/dt=100A/μs	---	7	---	ns
Q_{rr}	Body Diode Reverse Recovery		---	5.9	---	nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition : T_J=25°C, V_{DD}=15V, V_G=10V, L=0.5mH, R_g=25Ω, I_{AS}=9A
T_J=25°C, V_{DD}= -15V, V_G= -10V, L=0.5mH, R_g=25Ω, I_{AS}= -10A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Performance Characteristics-N

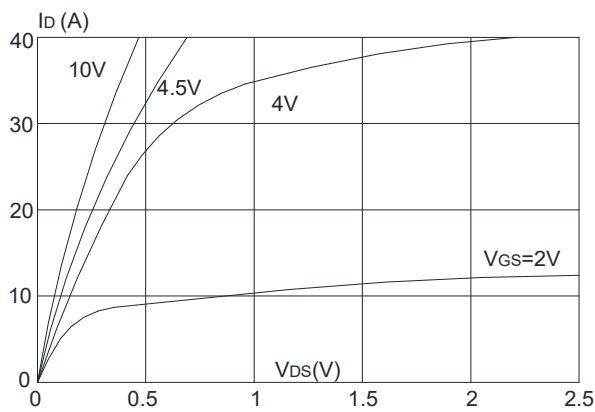


Figure1: Output Characteristics

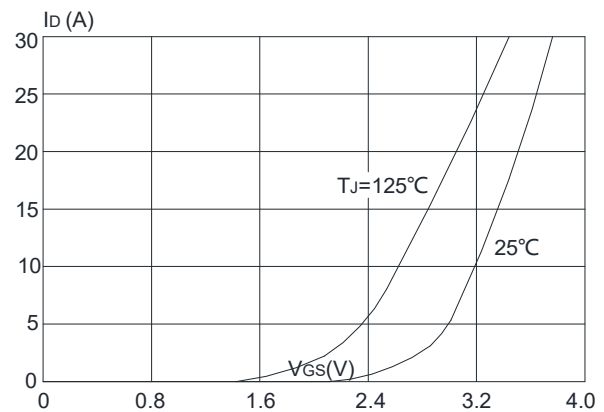


Figure 2: Typical Transfer Characteristics

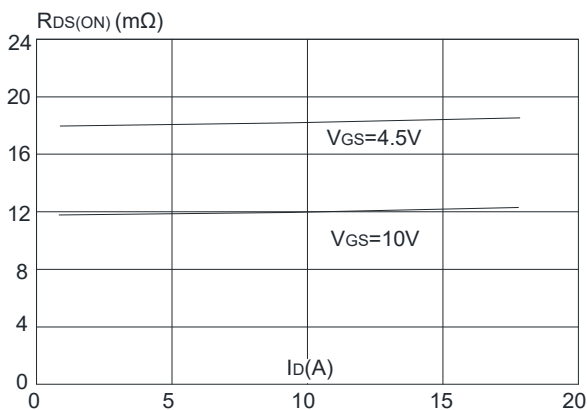


Figure 3: On-resistance vs. Drain Current

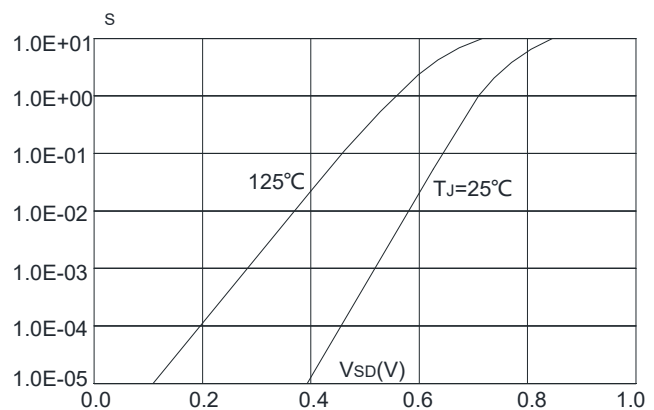


Figure 4: Body Diode Characteristics

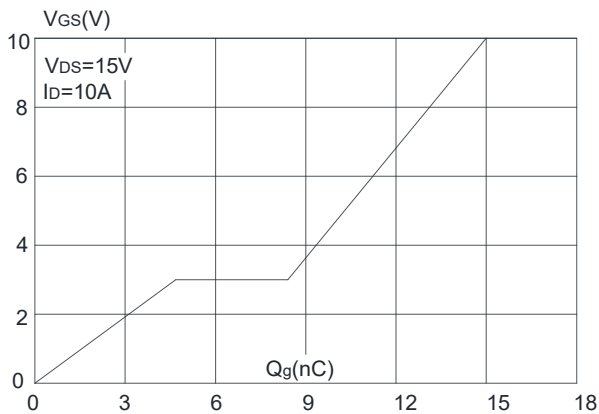


Figure 5: Gate Charge Characteristics

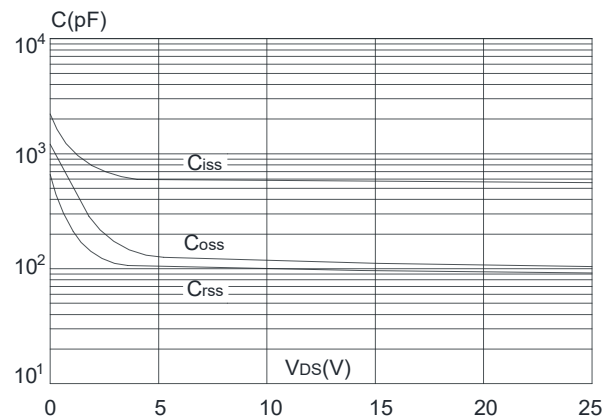


Figure 6: Capacitance Characteristics

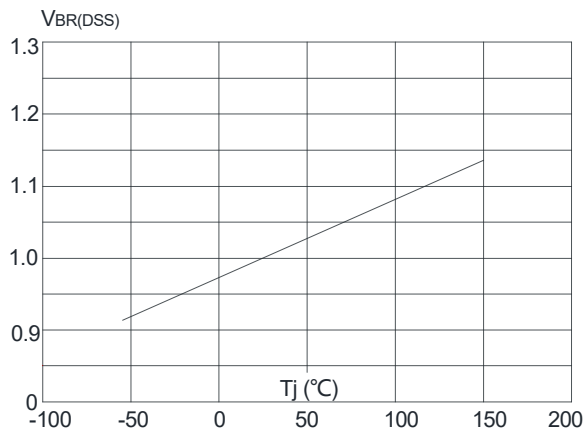


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

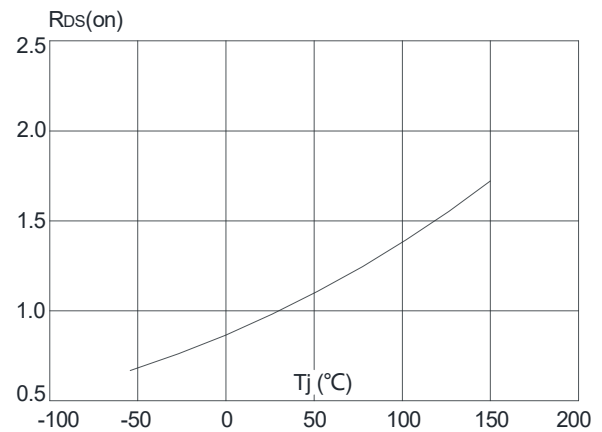


Figure 8: Normalized on Resistance vs. Junction Temperature

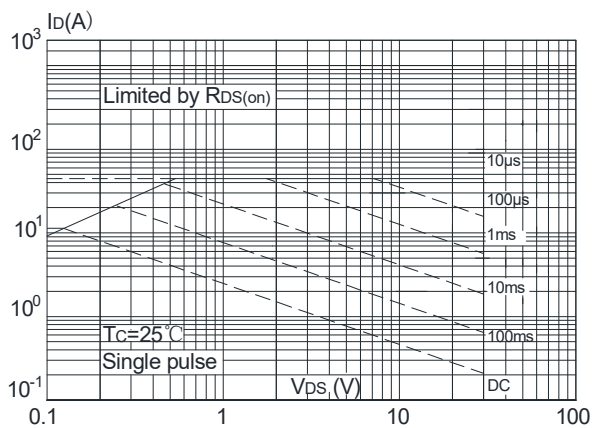


Figure 9: Maximum Safe Operating Area

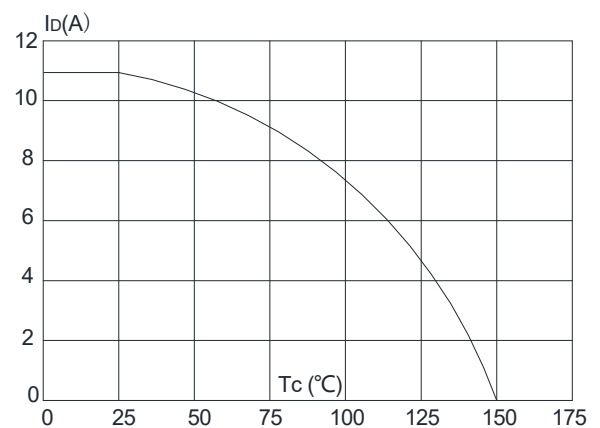


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

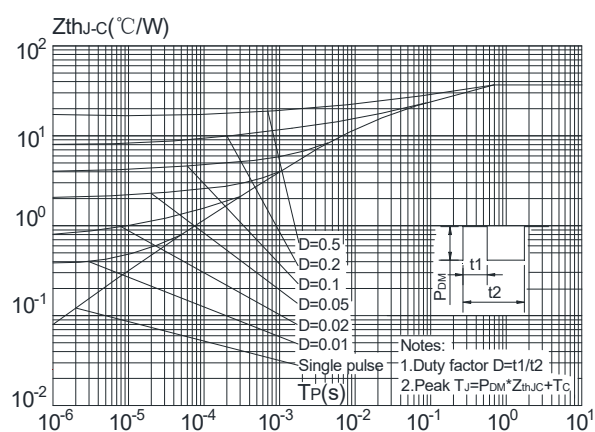


Figure.11: Maximum Effective
Transient Thermal Impedance, Junction-to-Case

P-Channel Electrical Characteristics: ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	-30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-30V	---	---	-1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics ³						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	-1	-1.5	-2.5	V
R _{DS(ON)}	Drain-Source On Resistance ^{note3}	V _{GS} =-10V, I _D =-10A	---	18	25	m Ω
		V _{GS} =-4.5V, I _D =-5A	---	25	35	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	1150	---	pF
C _{oss}	Output Capacitance		---	150	---	
C _{rss}	Reverse Transfer Capacitance		---	135	---	
Switching Characteristics ⁴						
t _{d(on)}	Turn-On Delay Time	V _{DD} = -15V, I _D = -1A, V _{GS} = -10V, R _{GEN} =6 Ω R _D =15 Ω	---	12	---	ns
t _r	Rise Time		---	13	---	ns
t _{d(off)}	Turn-Off Delay Time		---	195	---	ns
t _f	Fall Time		---	95	---	ns
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-15V, I _D =-8A	---	50	---	nC
Q _{gs}	Gate-Source Charge		---	9.5	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	8.3	---	nC
Drain-Source Diode Characteristics						
I _S	Continuous Drain to Source Diode	V _D =V _G =0V	---	---	-12	A
I _{SM}	Pulsed Drain to Source Diode	V _D =V _G =0V	---	---	-44	---
V _{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =-11A	---	-0.8	-1.2	V
T _{rr}	Reverse Recovery Time	T _J =25℃,	---	37	---	ns
Q _{rr}	Reverse Recovery Charge	I _F =-2A, dI/dt=-100A/ μ s	---	36	---	nC

Typical Performance Characteristics-P

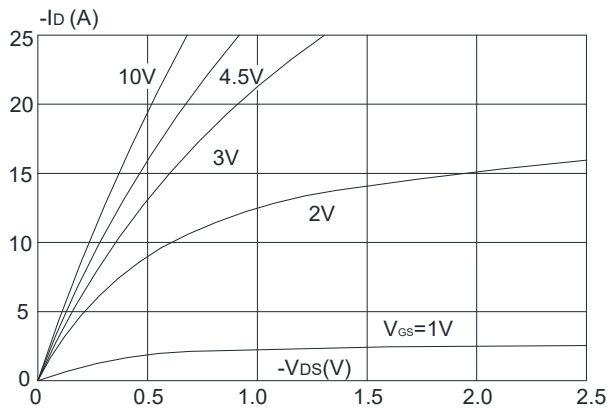


Figure1: Output Characteristics

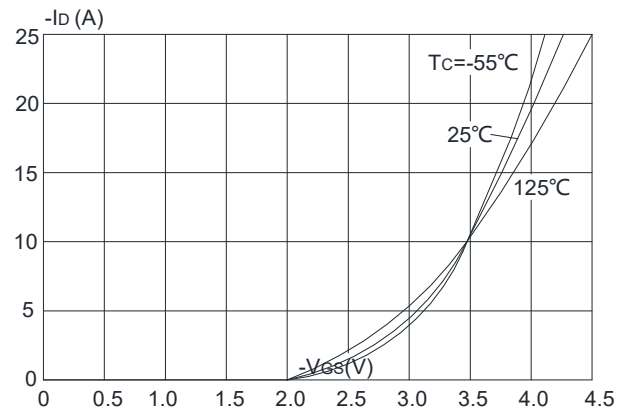


Figure 2: Typical Transfer Characteristics

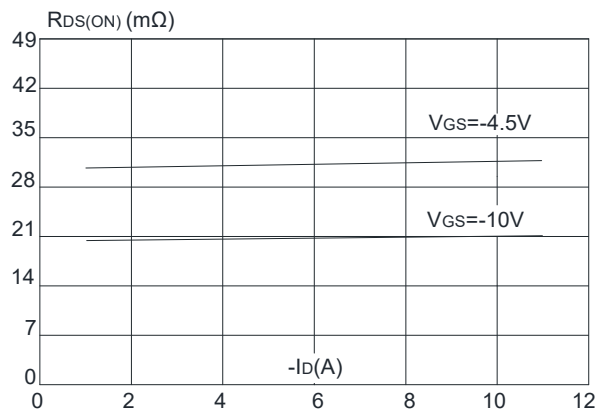


Figure 3: On-resistance vs. Drain Current

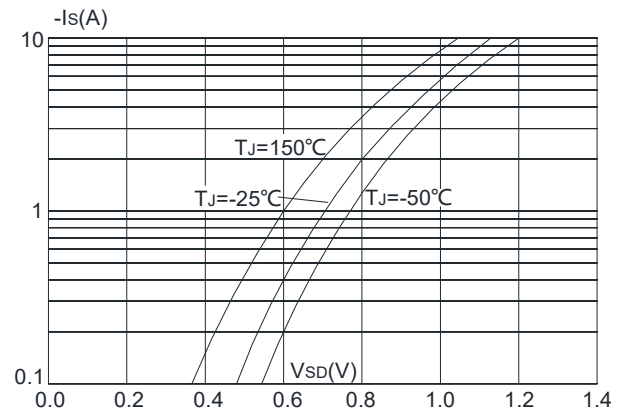


Figure 4: Body Diode Characteristics

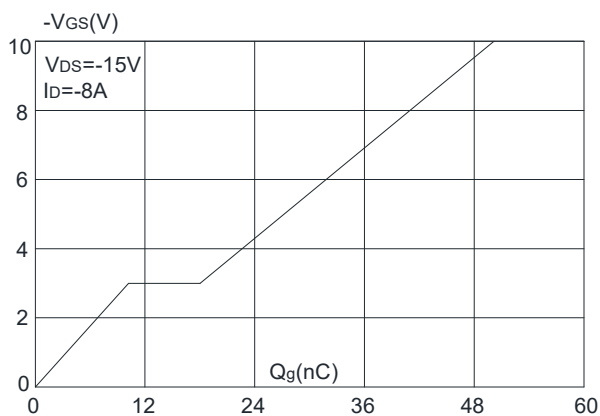


Figure 5: Gate Charge Characteristics

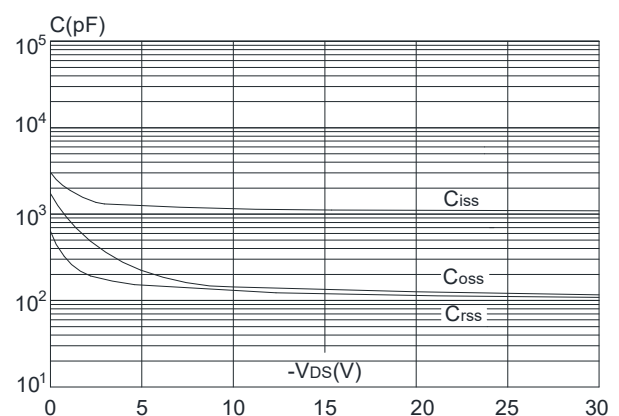


Figure 6: Capacitance Characteristics

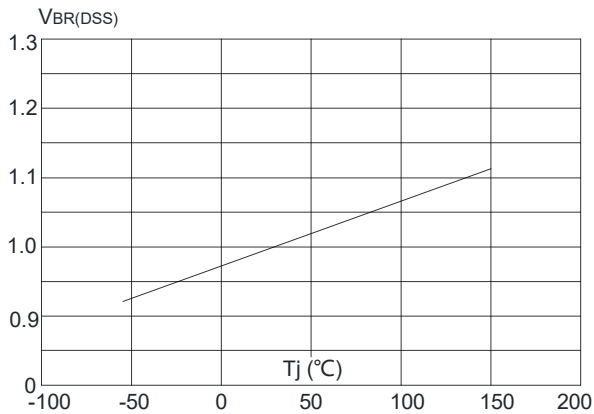


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

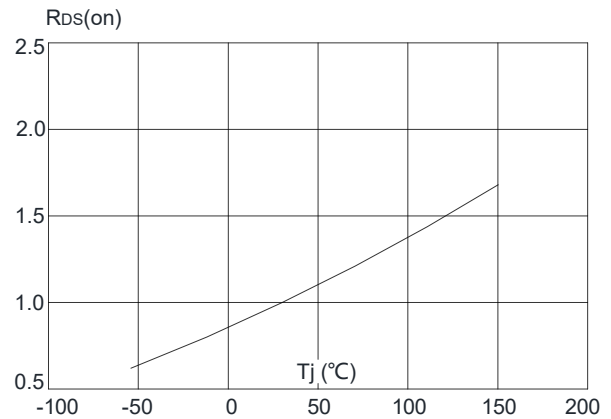


Figure 8: Normalized on Resistance vs. Junction Temperature

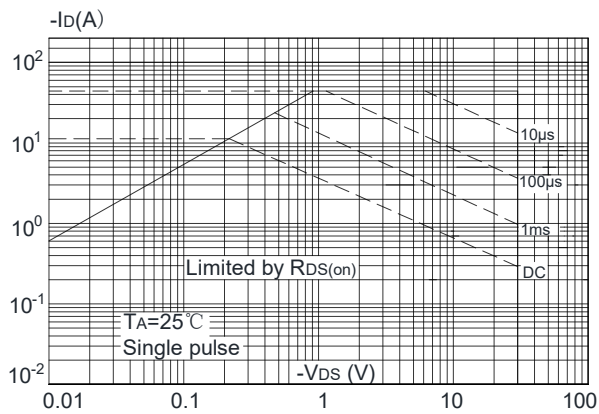


Figure 9: Maximum Safe Operating Area

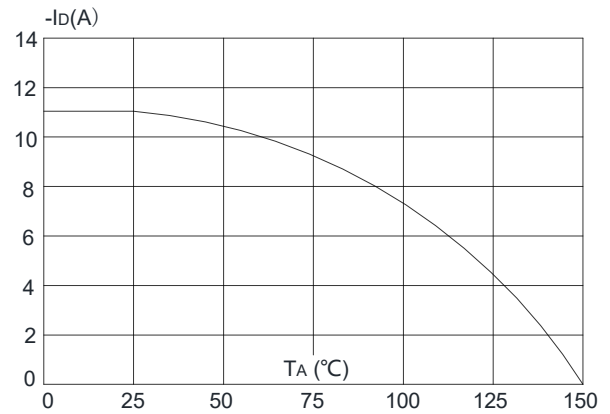


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

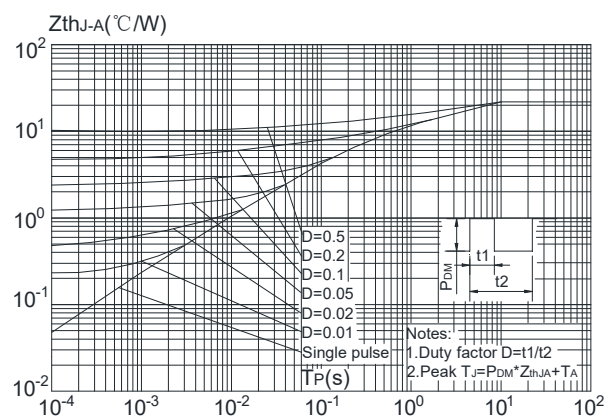
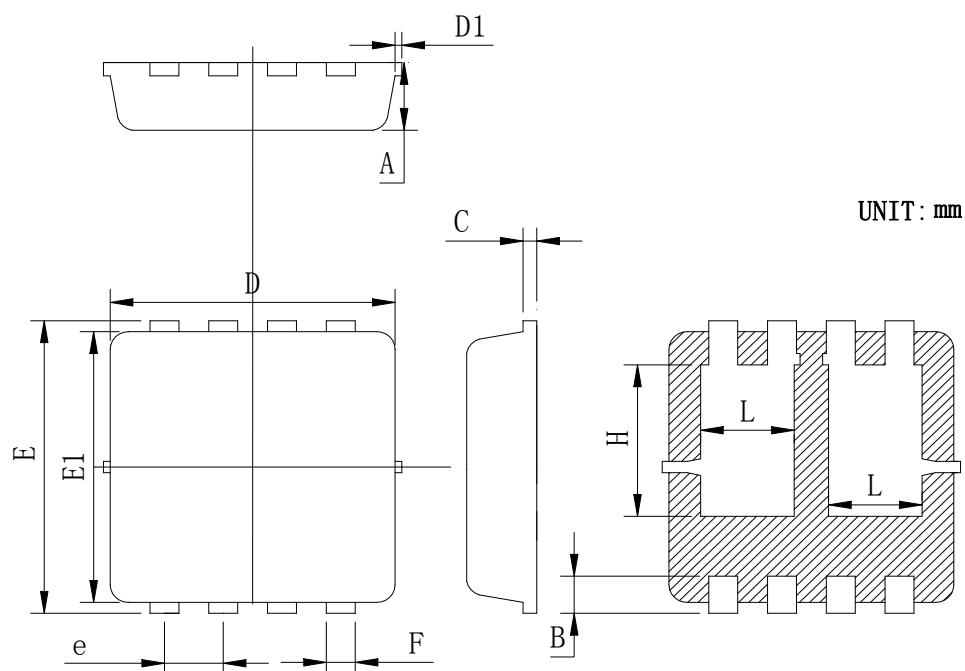
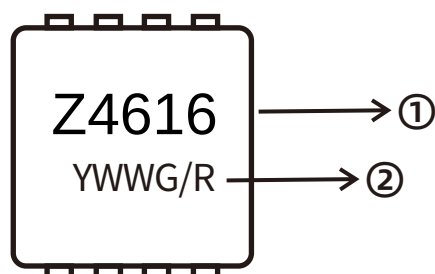


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

DFN3X3-8DPackage Outline Data


Symbol	Min	Typ	Max
A	0.725	0.775	0.825
B	0.28	0.38	0.48
C	0.13	0.15	0.20
D	3.05	3.15	3.25
D1			0.10
E	3.25	3.35	3.45
E1	3.0	3.1	3.2
e	0.60	0.65	0.70
F	0.27	0.32	0.37
H	1.63	1.73	1.83
L	0.93	1.03	1.13

Marking Information



①: Part NO.

②: Date Code (YWWG / R)

Y: Year Code , last digit of the year

WW : Week Code (01-53)

G/R: G(Green) /R(Lead Free)

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