

## Description:

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

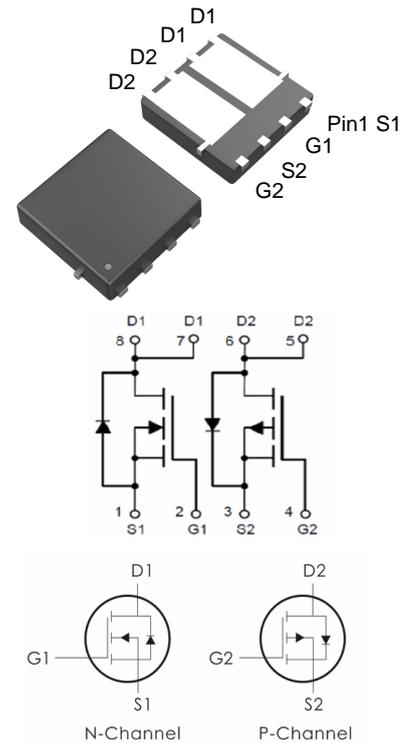
It can be used in a wide variety of applications.

## Features:

N-Channel:  $V_{DS}=30V, I_D=18A, R_{DS(ON)} < 21m\Omega @ V_{GS}=10V$  (Typ:  $16m\Omega$ )

P-Channel:  $V_{DS}=-30V, I_D=-15A, R_{DS(ON)} < 36m\Omega @ V_{GS}=-10V$  (Typ:  $28m\Omega$ )

- 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.
- 5) MSL3



## Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
DOZ4606B	Z4606B	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	$\pm 20$	$\pm 20$	V
$I_D$	Continuous Drain Current- $T_C=25^\circ C$ <sup>1</sup>	18	-15	A
	Continuous Drain Current- $T_C=100^\circ C$ <sup>1</sup>	12.6	-10.5	
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	72	-60	A
$E_{AS}$	Single pulse avalanche energy <sup>3</sup>	10.8	10.8	mJ
$P_D$	Power Dissipation - $T_C=25^\circ C$	17.8	17.8	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
$R_{\theta JC}$	Thermal Resistance, Junction to Cast	7	7	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	30	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=30V$	---	---	1	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	1.2	1.5	2.5	V
$R_{DS(on)}$	Drain-Source On Resistance <sup>4</sup>	$V_{GS}=10V, I_D=5.5A$	---	16	21	$\text{m}\Omega$
		$V_{GS}=4.5V, I_D=4.5A$	---	25	32.5	
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	490	---	pF
$C_{oss}$	Output Capacitance		---	72.4	---	
$C_{rss}$	Reverse Transfer Capacitance		---	55.6	---	
<b>Switching Characteristics<sup>4</sup></b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=15V, I_D=5A,$ $R_{REN}=3\ \Omega, V_{GS}=10V$	---	4	---	ns
$t_r$	Rise Time		---	11	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	14.7	---	ns
$t_f$	Fall Time		---	2	---	ns
$Q_g$	Total Gate Charge		$V_{GS}=10V, V_{DS}=15V,$ $I_D=5A$	---	10	---
$Q_{gs}$	Gate-Source Charge	---		2	---	nC
$Q_{gd}$	Gate-Drain "Miller" Charge	---		2	---	nC
<b>Drain-Source Diode Characteristics</b>						
$I_S$	Continuous Drain to Source Diode	$V_D=V_G=0V$	---	---	18	A
$I_{SM}$	Pulsed Drain to Source Diode		---	---	72	A
$V_{SD}$	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=5.8A$	---	---	1.2	V
$T_{rr}$	Reverse Recovery Time	$I_f=5A, T_J=25^\circ\text{C}$	---	7.5	---	ns
$Q_{rr}$	Reverse Recovery Charge	$di/dt=100A/\mu\text{s}$	---	2	---	nC

## Notes:

1. Computed continuous current assumes the condition of  $T_{j,Max}$  while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. EAS condition :  $T_J=25^{\circ}C, V_{DD}=15V, V_G=10V, L=0.1mH$
4. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 0.5\%$

## N-Typical Characteristics: ( $T_C=25^{\circ}C$ unless otherwise noted)

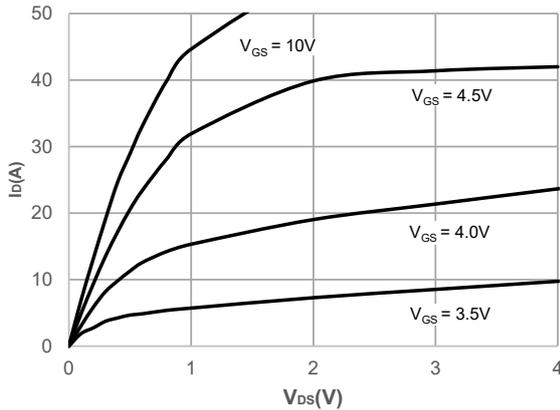


Figure 1: Output Characteristics

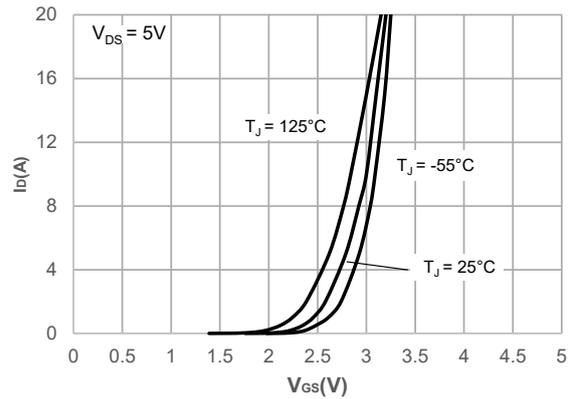


Figure 2: Typical Transfer Characteristics

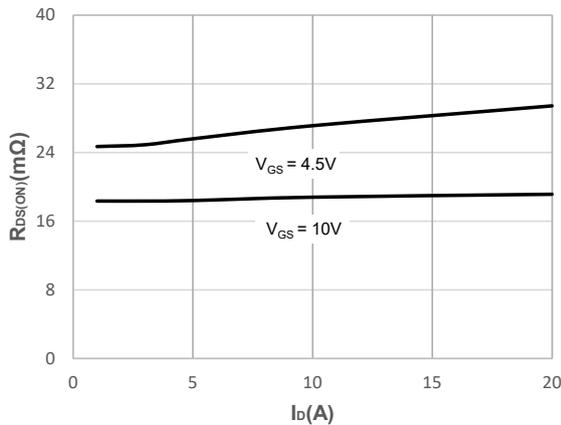


Figure 3: On-resistance vs. Drain Current

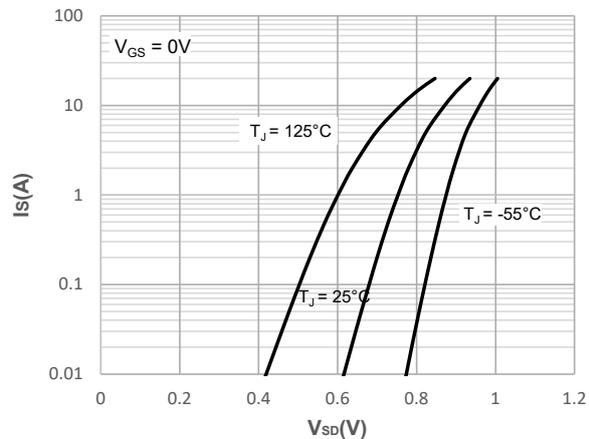


Figure 4: Body Diode Characteristics

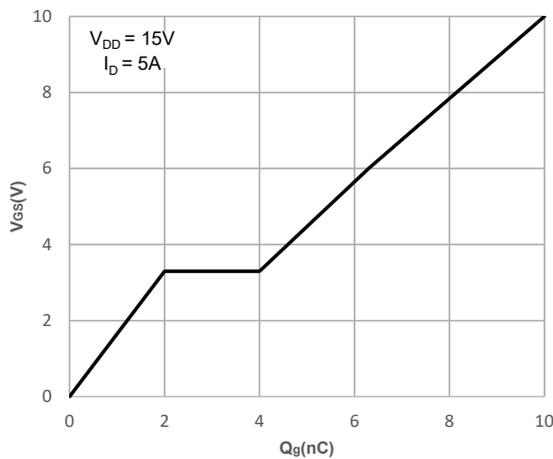


Figure 5: Gate Charge Characteristics

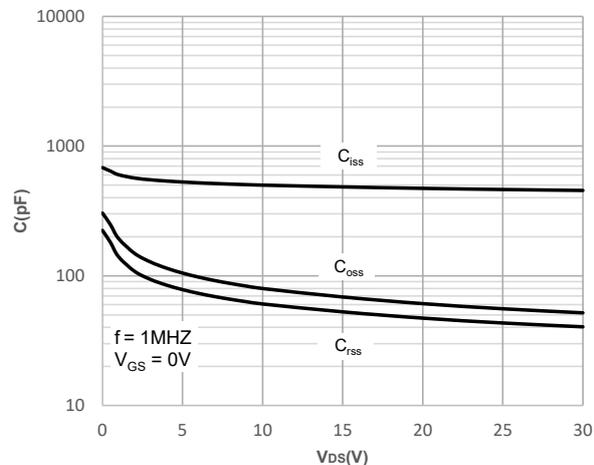
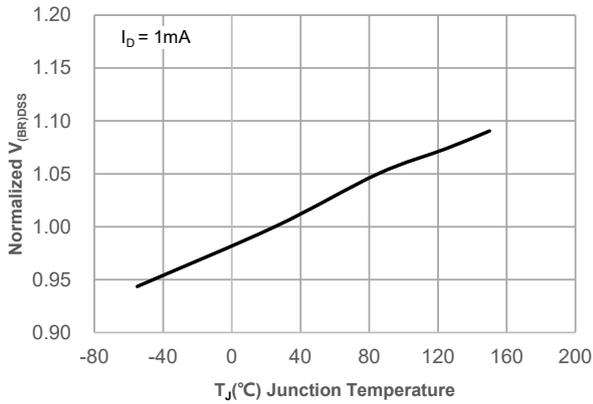
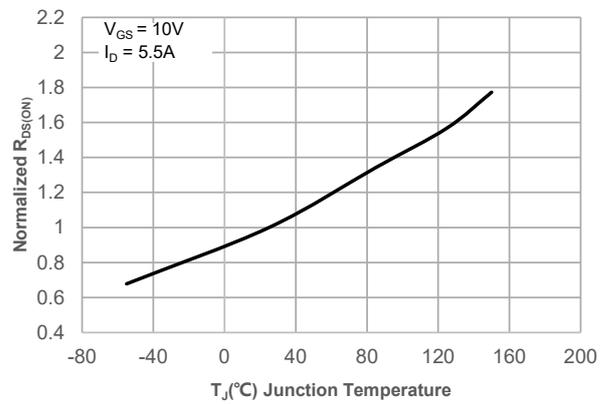


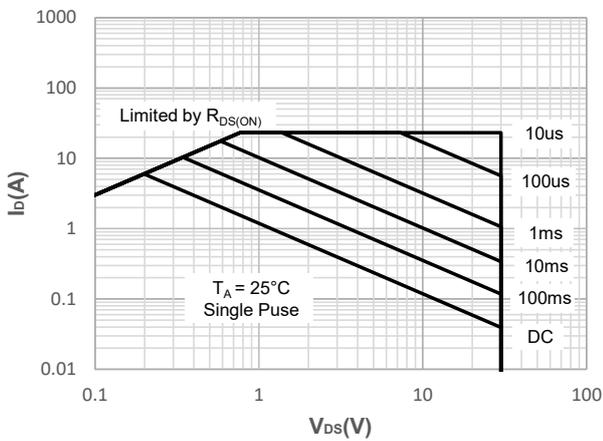
Figure 6: Capacitance Characteristics



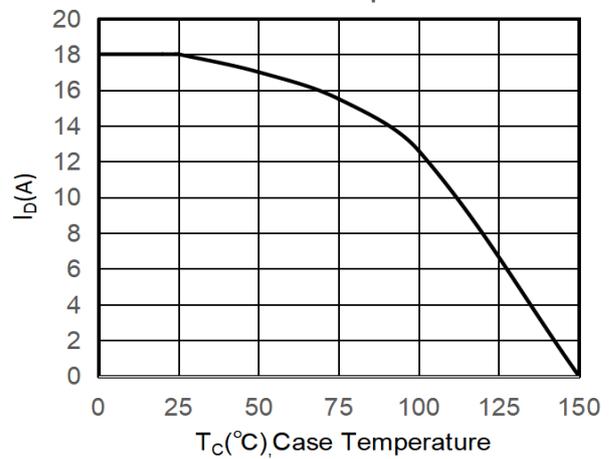
**Figure 7: Normalized Breakdown voltage vs. Junction Temperature**



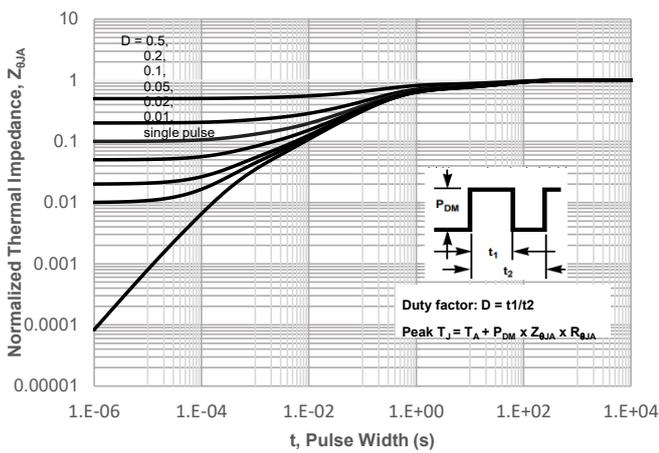
**Figure 8: Normalized on Resistance vs. Junction Temperature**



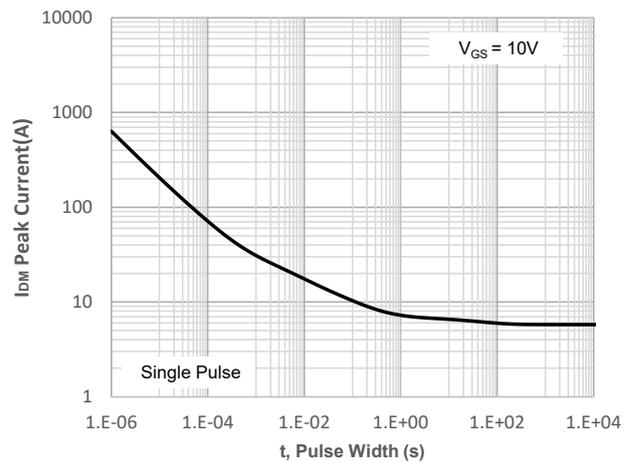
**Figure 9: Maximum Safe Operating Area**



**Figure 10: Maximum Continuous Driant Current vs. Ambient Temperature**



**Figure 11: Normalized Maximum Transient Thermal Impedance**



**Figure 12: Peak Current Capacity**

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	-30	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=-30V$	---	---	-1	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	Gate-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	-1	-1.6	-2.5	V
$R_{DS(on)}$	Drain-Source On Resistance <sup>4</sup>	$V_{GS}=-10V, I_D=-4.1A$	---	28	36	$\text{m}\Omega$
		$V_{GS}=-4.5V, I_D=-3.5A$	---	50	65	
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	---	650	---	pF
$C_{oss}$	Output Capacitance		---	75.6	---	
$C_{rss}$	Reverse Transfer Capacitance		---	63	---	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD}=-15V, I_D=-2A$ $V_{GS}=-10V, R_{GEN}=3\ \Omega$	---	3	---	ns
$t_r$	Rise Time		---	2	---	ns
$t_{d(off)}$	Turn-Off Delay Time		---	27	---	ns
$t_f$	Fall Time		---	15	---	ns
$Q_g$	Total Gate Charge		---	11	---	nC
$Q_{gs}$	Gate-Source Charge	$V_{GS}=-10V, V_{DS}=-15V,$ $I_D=-2A$	---	2	---	nC
$Q_{gd}$	Gate-Drain "Miller" Charge		---	2	---	nC
<b>Drain-Source Diode Characteristics</b>						
$I_S$	Continuous Drain to Source Diode	$V_D=V_G=0V$	---	---	-15	A
$I_{SM}$	Pulsed Drain to Source Diode		---	---	-60	A
$T_{rr}$	Reverse Recovery Time	$I_F=-2A, T_J=25^\circ\text{C}$	---	9	---	ns
$Q_{rr}$	Reverse Recovery Charge	$dI/dt=100A/\mu\text{s}$	---	3	---	nC
$V_{SD}$	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=-4.1A$	---	---	-1.2	V

## Notes:

1. Computed continuous current assumes the condition of  $T_{j,Max}$  while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. EAS condition :  $T_J=25^{\circ}C, V_{DD}=-15V, V_G=-10V, L=0.1mH$
4. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 0.5\%$

## P-Typical Characteristics: ( $T_C=25^{\circ}C$ unless otherwise noted)

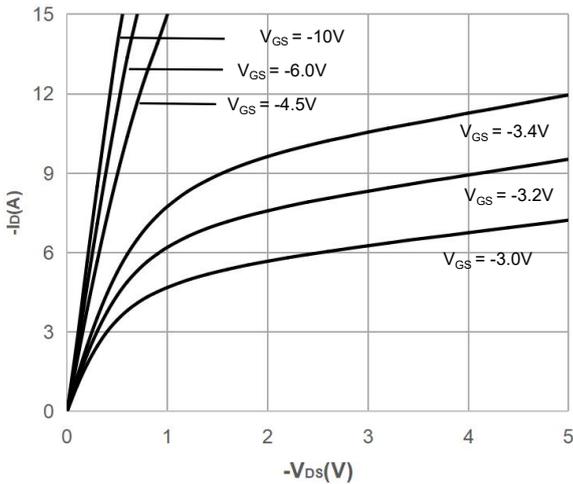


Figure 1: Output Characteristics

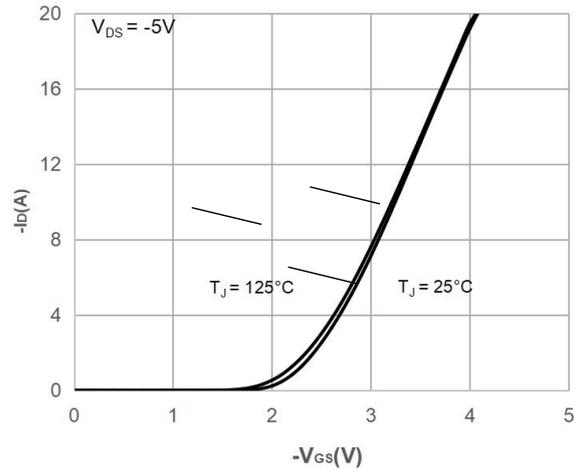


Figure 2: Typical Transfer Characteristics

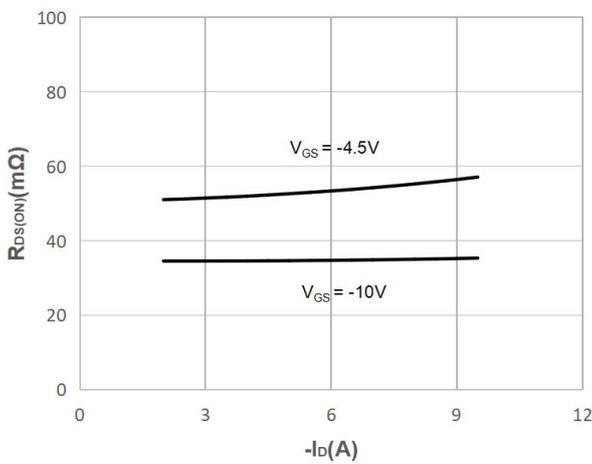


Figure 3: On-resistance vs. Drain Current

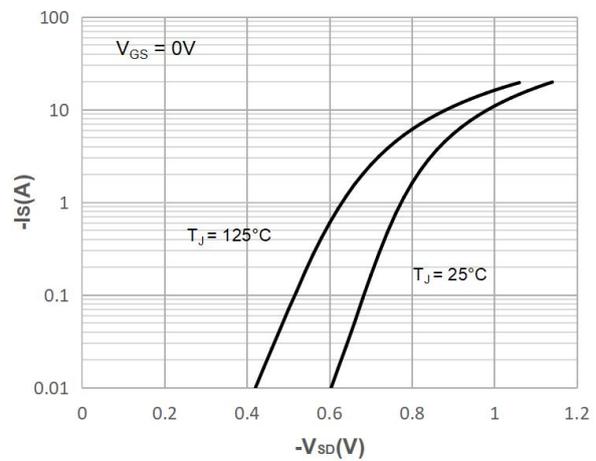


Figure 4: Body Diode Characteristics

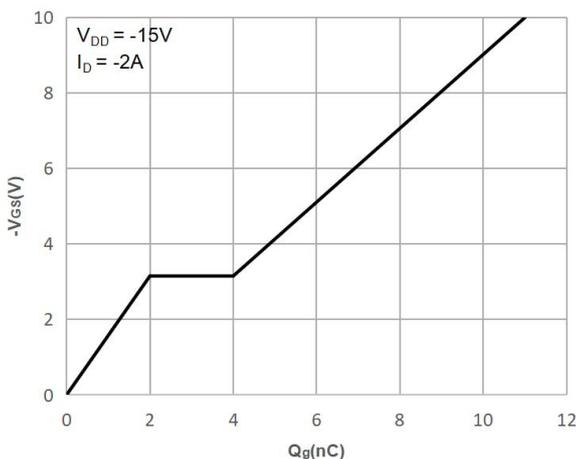


Figure 5: Gate Charge Characteristics

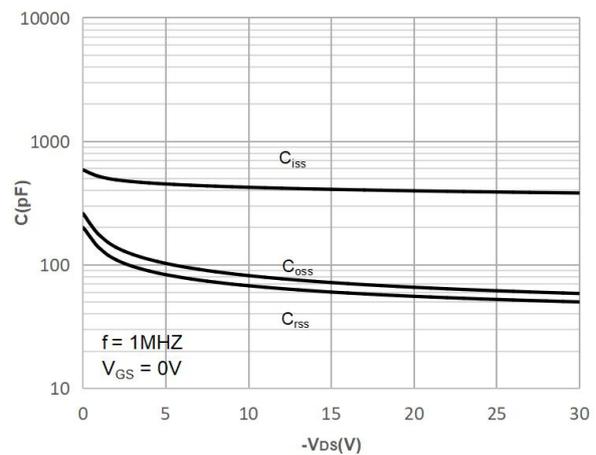
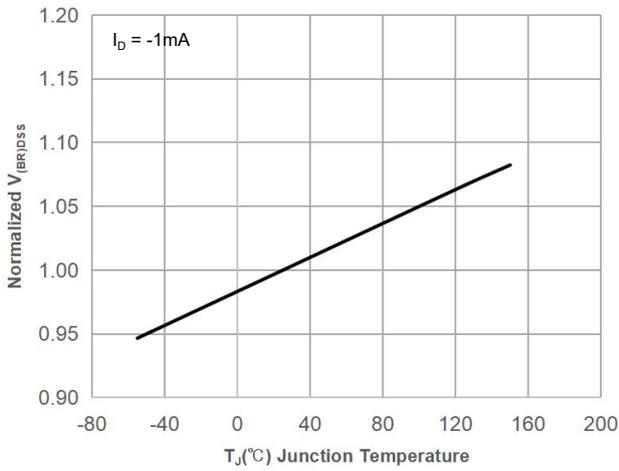
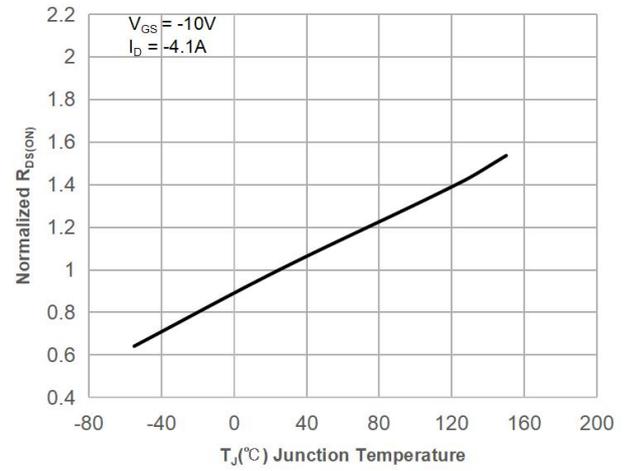


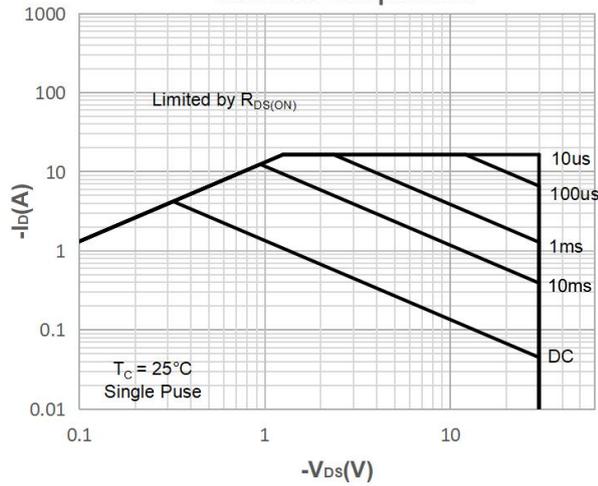
Figure 6: Capacitance Characteristics



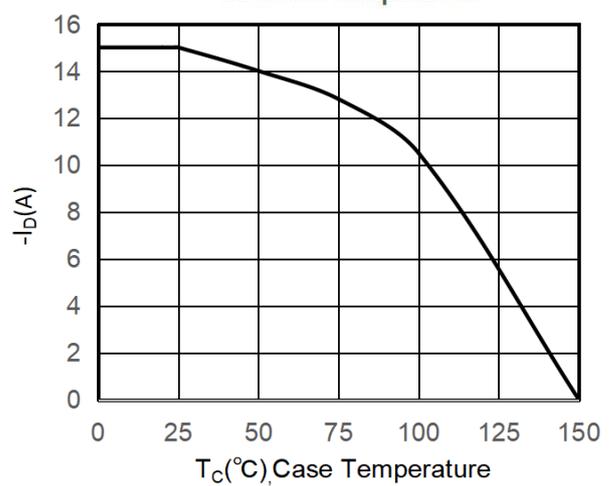
**Figure 7: Normalized Breakdown voltage vs. Junction Temperature**



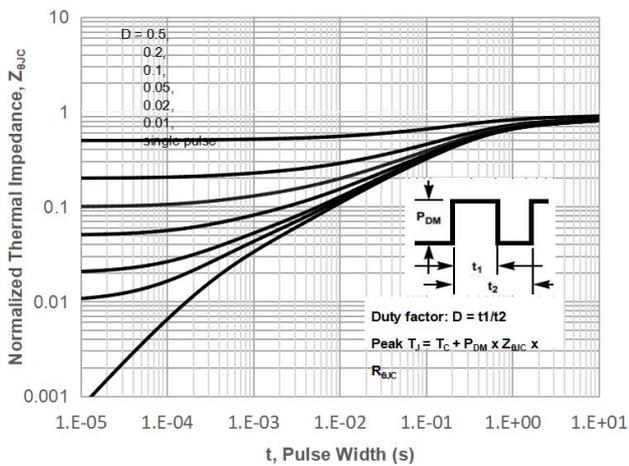
**Figure 8: Normalized on Resistance vs. Junction Temperature**



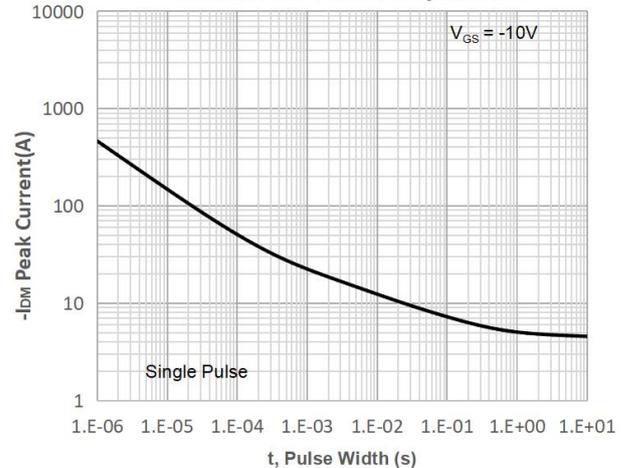
**Figure 9: Maximum Safe Operating Area**



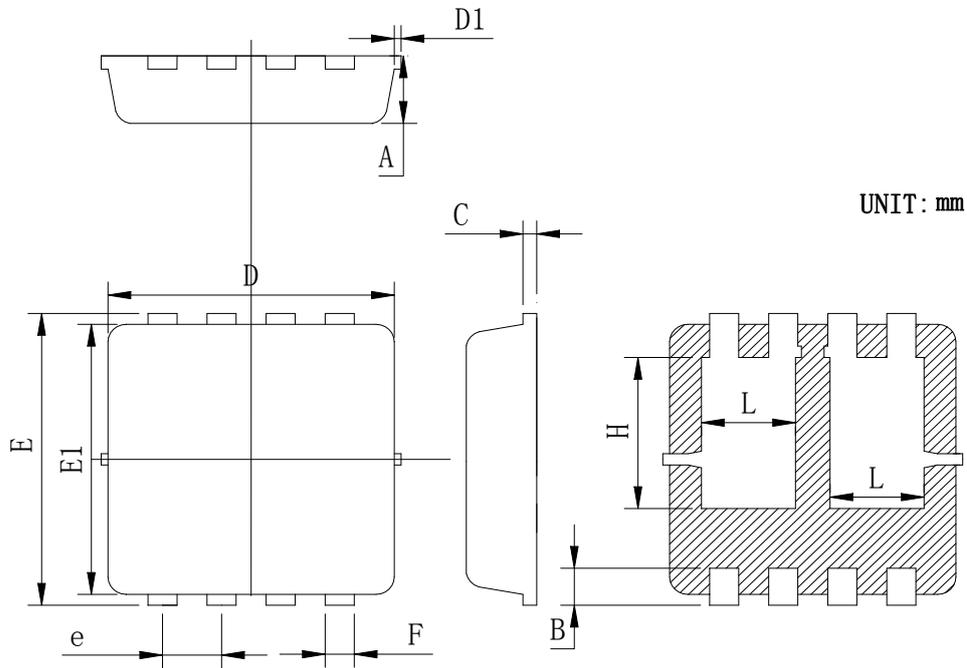
**Figure 10: Maximum Continuous Driant Current vs. Case Temperature**



**Figure 11: Normalized Maximum Transient Thermal Impedance**



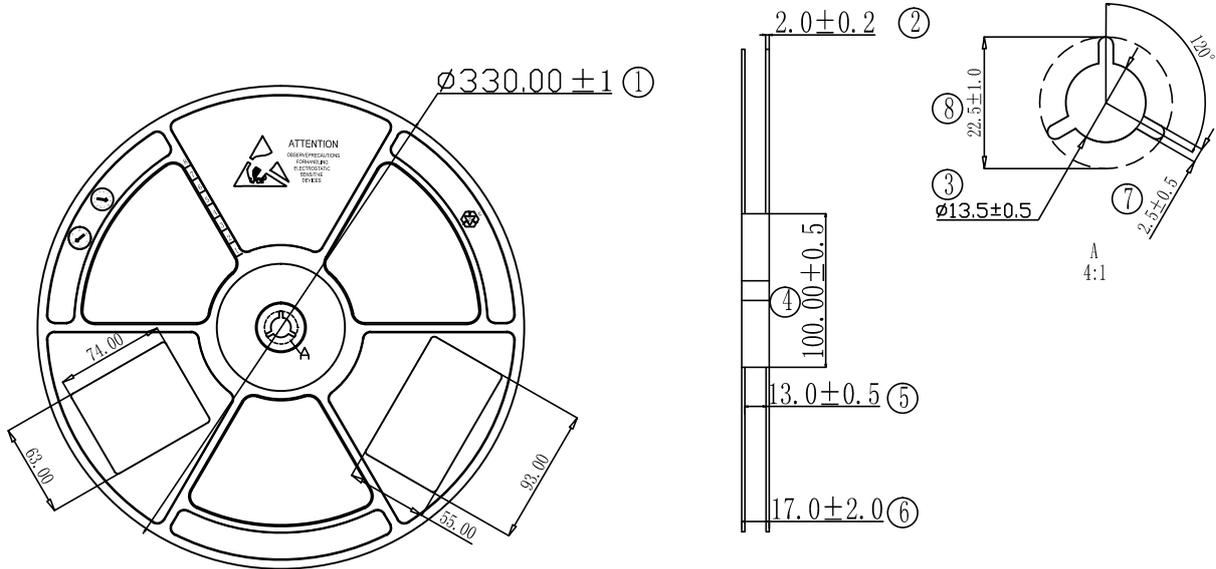
**Figure 12: Peak Current Capacity**

**DFN3X3-8DPackage Outline Data**


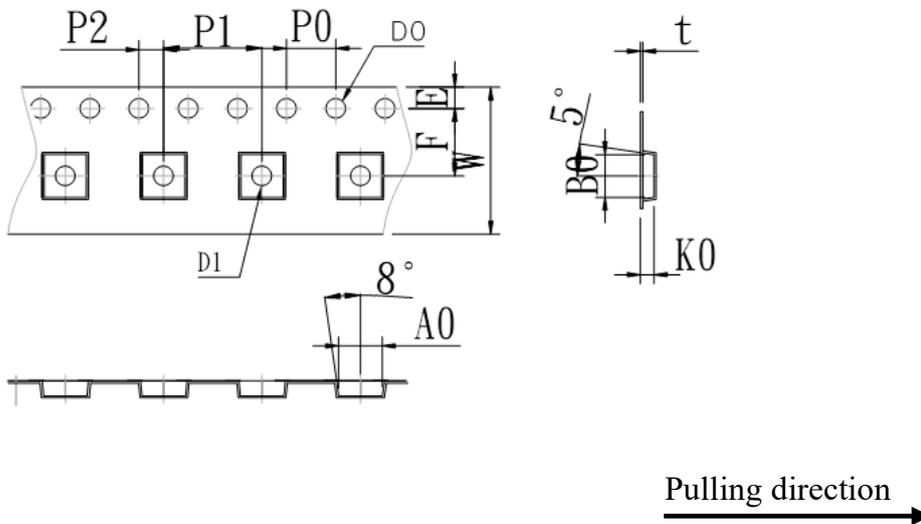
Symbol	Min	Typ	Max
A	0.725	0.775	0.825
B	0.28	0.38	0.48
C	0.13	0.15	0.20
D	3.05	3.15	3.25
D1			0.10
E	3.25	3.35	3.45
E1	3.0	3.1	3.2
e	0.60	0.65	0.70
F	0.27	0.32	0.37
H	1.63	1.73	1.83
L	0.93	1.03	1.13

## Tape & Reel Information

Dimensions in mm



Symbol	A0	B0	K0	D0	D1	P0	P1	10*P0
Spec	3.55±0.10	3.45±0.10	1.13±0.10	1.55±0.10	1.55±0.10	4.00±0.10	8.00±0.10	40.0±0.10
Symbol	W	E	F	P2	t			
Spec	12.00±0.10	1.75±0.10	5.50±0.10	2.00±0.10	0.20±0.05			



## Marking Information:

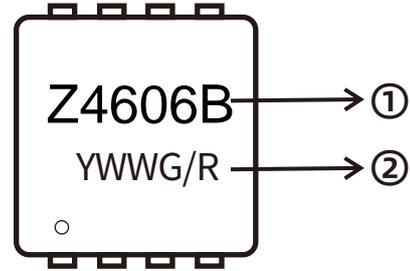
①:Part NO.

② : Date Code (YWWG / R)

Y: Year Code , last digit of the year

WW : Week Code (01-53)

G/R: G(Green) R(L/ead Free)



## Previous Version

Version	Date	Subjects (major changes since last revision)
1.3	2025-09-01	Release of final version

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