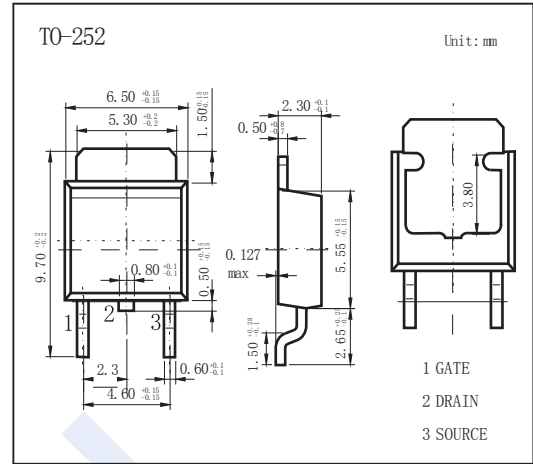
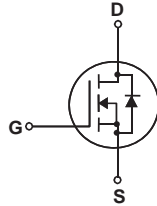


## N-Channel Enhancement MOSFET

## NDT4N65 (KDT4N65)

## ■ Features

- $V_{DS} = 650V$
- $I_D = 4.0 A$  ( $V_{GS} = 10V$ )
- $R_{DS(ON)} < 3 \Omega$  ( $V_{GS} = 10V$ )

■ Absolute Maximum Ratings  $T_a = 25^\circ C$ 

Parameter	Symbol	Rating	Unit	
Drain-Source Voltage	$V_{DS}$	650	V	
Gate-Source Voltage	$V_{GS}$	$\pm 30$		
Continuous Drain Current	$I_D$	$T_a = 25^\circ C$	A	
		$T_a = 100^\circ C$		2.4
Pulsed Drain Current (*a)	$I_{DM}$	12	A	
Avalanche Current (*a)	$I_{AR}$	4.5		
Power Dissipation	$P_D$	$T_a = 25^\circ C$	58	W
		Derate above $25^\circ C$	0.46	W/ $^\circ C$
Single Pulsed Avalanche Energy (*b)	EAS	210	mJ	
Repetitive Avalanche Energy (*a)	EAR	5.8		
Peak Diode Recovery $dv/dt$ (*c)	$dv/dt$	4.5	V/ns	
Thermal Resistance.Junction- to-Ambient	$R_{thJA}$	110	$^\circ C/W$	
Thermal Resistance.Junction- to-Case	$R_{thJC}$	2.16		
Thermal Resistance.Case-to-Sink Typ	$R_{thJS}$	50		
Maximum lead Temperature for soldering purpose, 1/8 from case for 5 seconds	TL	300	$^\circ C$	
Junction Temperature	$T_J$	150		
Storage Temperature Range	$T_{stg}$	-55 to 150		

Notes:

- a.Repetitive Rating :Pulse width limited by maximum junction temperature  
 b. $I_{AS}=4.5A, V_{DD}=50V, R_G=25\Omega, \text{Starting } T_J=25^\circ C$   
 c. $I_{SD} \leq 4.5A, di/dt \leq 200A/us, V_{DD} \leq BV_{DSS}, \text{Starting } T_J=25^\circ C$

## N-Channel Enhancement MOSFET

## NDT4N65 (KDT4N65)

## ■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V <sub>DSS</sub>	I <sub>D</sub> =250 μ A, V <sub>GS</sub> =0V	650			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =650V, V <sub>GS</sub> =0V			1	μ A
		V <sub>DS</sub> =520V, V <sub>GS</sub> =0V, Ta=125°C			10	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±30V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250 μ A	2.0		4.0	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =1.5A		2.5	3.0	Ω
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =40V, I <sub>D</sub> =1.5A (*a)		4.7		S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1MHz		560		pF
Output Capacitance	C <sub>oss</sub>			55		
Reverse Transfer Capacitance	C <sub>rss</sub>			7		
Total Gate Charge	Q <sub>g</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> =480V, I <sub>D</sub> =4.5A (*a/b)		16		nC
Gate Source Charge	Q <sub>gs</sub>			2.5		
Gate Drain Charge	Q <sub>gd</sub>			6.5		
Turn-On DelayTime	t <sub>d(on)</sub>	I <sub>D</sub> =4.5A, V <sub>DS</sub> =300V, R <sub>GEN</sub> =25 Ω (*a/b)		10		ns
Turn-On Rise Time	t <sub>r</sub>			40		
Turn-Off DelayTime	t <sub>d(off)</sub>			40		
Turn-Off Fall Time	t <sub>f</sub>			50		
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 4.5A, di/dt= 100A/μ s V <sub>GS</sub> =0V (*a)		300		uC
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			2.0		
Maximum Body-Diode Continuous Current	I <sub>S</sub>				4.0	A
Maximum Pulsed Drain-Source Current	I <sub>SM</sub>				12	
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =4.0A, V <sub>GS</sub> =0V			1.4	V

## Notes:

- a. Pulse Test: Pulse width ≤ 300 μs, Duty cycle ≤ 2%  
b. Essentially independent of operating temperature

## N-Channel Enhancement MOSFET NDT4N65 (KDT4N65)

■ Typical Characteristics

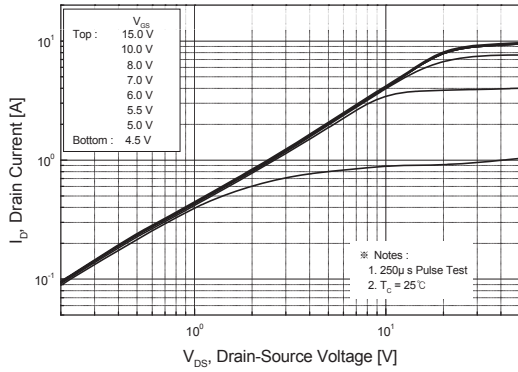


Figure 1. On-Region Characteristics

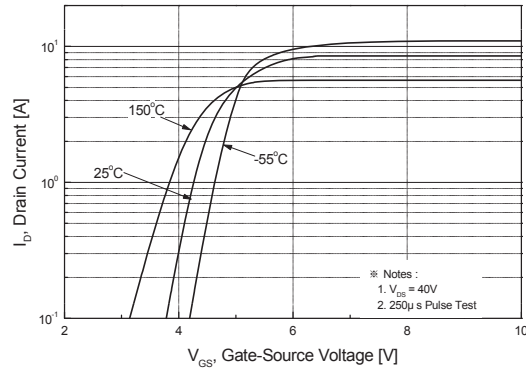


Figure 2. Transfer Characteristics

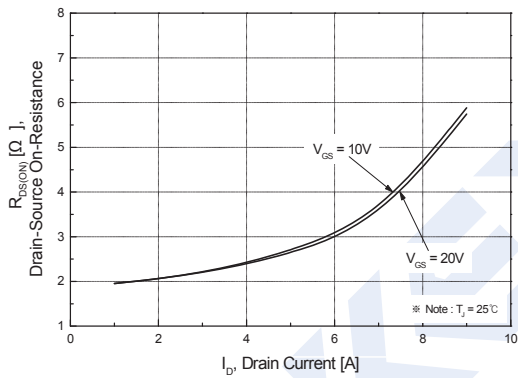


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

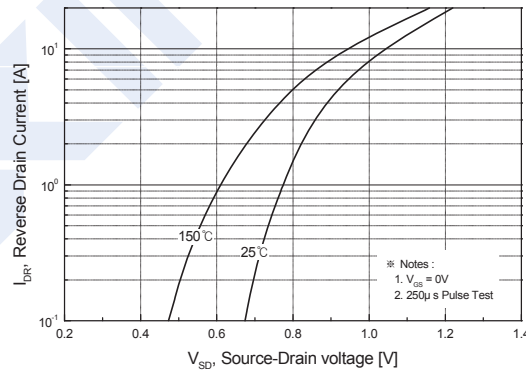


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

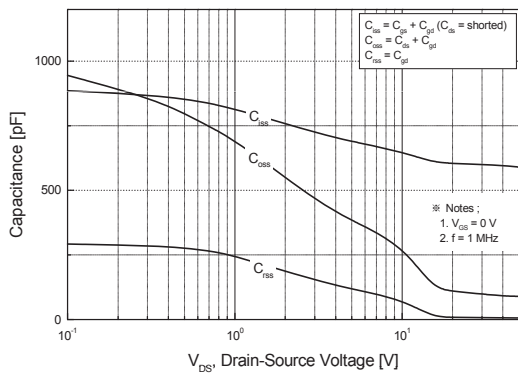


Figure 5. Capacitance Characteristics

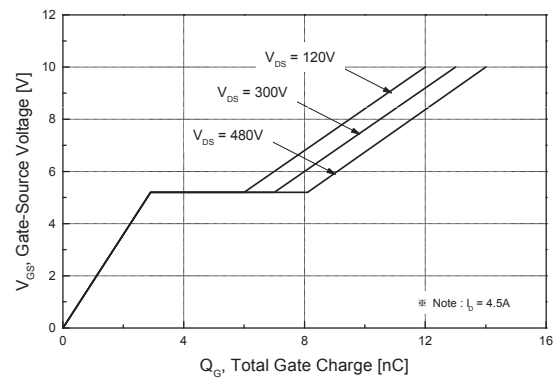


Figure 6. Gate Charge Characteristics

## N-Channel Enhancement MOSFET

### NDT4N65 (KDT4N65)

#### Typical Characteristics

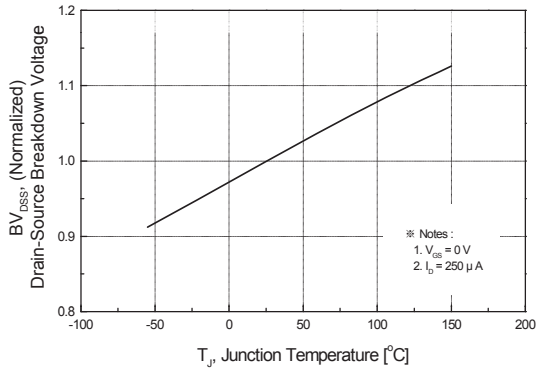


Figure 7. Breakdown Voltage Variation vs Temperature

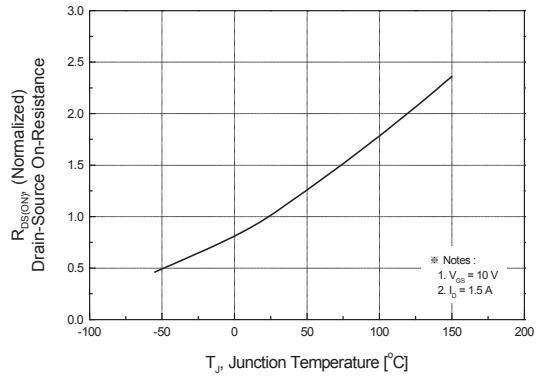


Figure 8. On-Resistance Variation vs Temperature

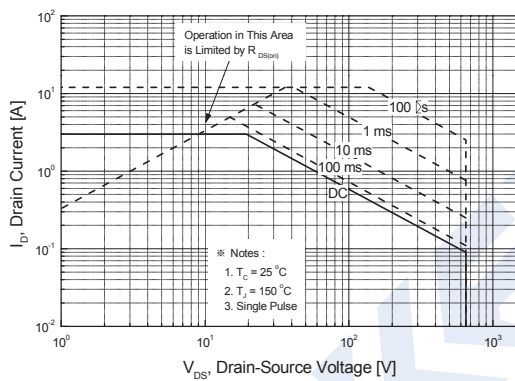


Figure 9. Maximum Safe Operating Area

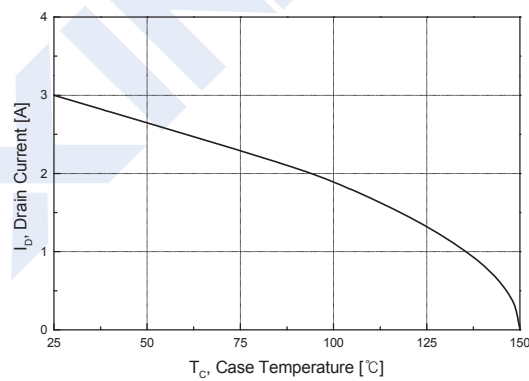


Figure 10. Maximum Drain Current vs Case Temperature

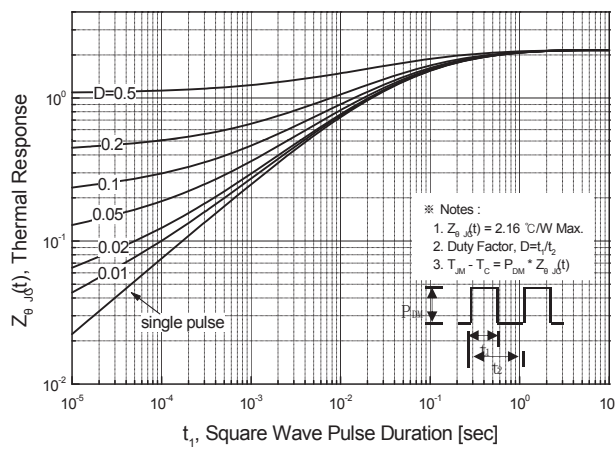


Figure 11. Transient Thermal Response Curve