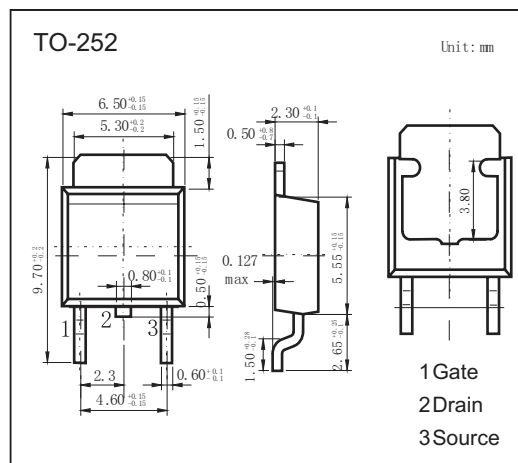
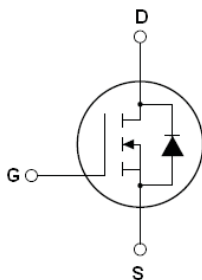


## N-Channel Trench Power MOSFET

## NDT70N06

## ■ Features

- $V_{DS} = 60V$ ;  $I_D = 88A$
- $R_{DS(ON)} < 6.6m\Omega$  ( $V_{GS} = 10V$ )
- Ultra Low On-Resistance
- High UIS and UIS 100% Test

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current	$I_D$	$T_c=25^\circ C$	A
		$T_c=100^\circ C$	
Pulsed Drain Current <sup>(Note 1)</sup>		352	
Power Dissipation	$P_D$	111	W
Single Pulse Avalanche Energy <sup>(Note 2)</sup>	$E_{AS}$	484	mJ
Thermal Resistance, Junction- to-Case	$R_{thJC}$	1.35	$^\circ C/W$
Junction Temperature	$T_J$	175	$^\circ C$
Storage Temperature Range	$T_{stg}$	-55 to +175	

Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature

2.  $E_{AS}$  condition:  $T_J=25^\circ C$ ,  $V_{DD}=30V$ ,  $V_G=10V$ ,  $R_G=25\Omega$

## N-Channel Trench Power MOSFET

## NDT70N06

## ■ 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> =250μA, V <sub>GS</sub> =0V	60			V
Zero Gate Voltage Drain Current (Tc=25°C)	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V			1	μA
Zero Gate Voltage Drain Current (Tc=100°C)	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V			5	
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2		4	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =12A			6.6	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =10V, I <sub>D</sub> =15A	20			S
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =30V, f=1MHz		4060		pF
Output Capacitance	C <sub>oss</sub>			385		
Reverse Transfer Capacitance	C <sub>rss</sub>			292		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =30V, I <sub>D</sub> =15A, V <sub>GS</sub> =10V		102		nC
Gate Source Charge	Q <sub>gs</sub>			20		nC
Gate Drain Charge	Q <sub>gd</sub>			49		nC
Turn-On DelayTime	t <sub>d(on)</sub>	V <sub>DS</sub> =30V, R <sub>L</sub> =2.5Ω V <sub>GS</sub> =10V, R <sub>G</sub> =3Ω		24		ns
Turn-On Rise Time	t <sub>r</sub>			32		
Turn-Off DelayTime	t <sub>d(off)</sub>			69		
Turn-Off Fall Time	t <sub>f</sub>			31		
Body Diode Reverse Recovery Time <sup>(Note1)</sup>	t <sub>rr</sub>	I <sub>F</sub> = 15A, di/dt= 100A/μs		28		nC
Body Diode Reverse Recovery Charge <sup>(Note1)</sup>	Q <sub>rr</sub>			39		
Maximum Body-Diode Continuous Current	I <sub>S</sub>			88		A
Maximum Body-Diode Pulsed Current	I <sub>SM</sub>			352		A
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =1A, V <sub>GS</sub> =0V			0.99	V
Forward Turn-on Time	t <sub>on</sub>	Intrinsic turn-on time is negligible(turn-on is dominated by L <sub>S</sub> +L <sub>D</sub> )				

Notes 1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 1.5%, Starting T<sub>J</sub> = 25°C

## ■ Marking

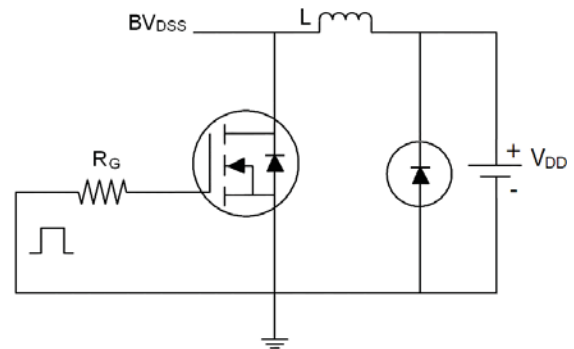
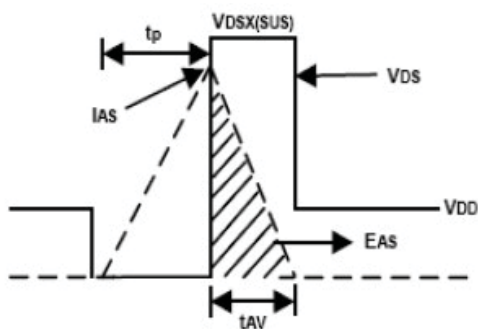
Marking	CSD60N53
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## N-Channel Trench Power MOSFET

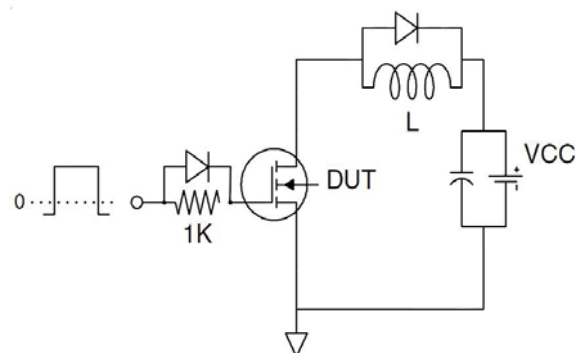
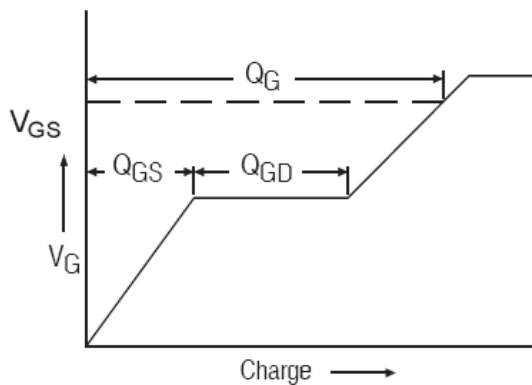
### NDT70N06

■ Test Circuits

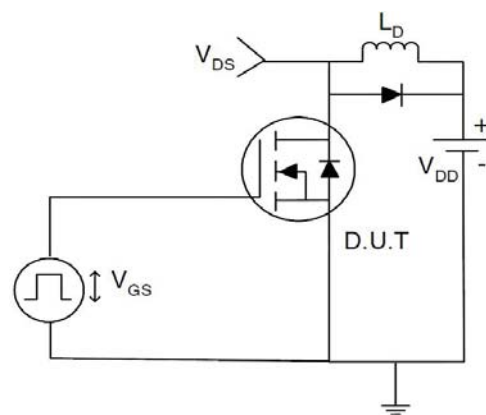
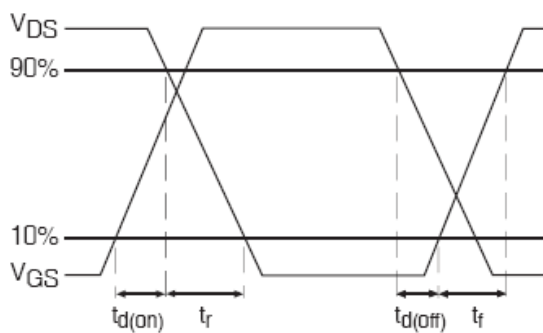
1)  $E_{AS}$  Test Circuits



2) Gate Charge Test Circuit:



3) Switch Time Test Circuit:



## N-Channel Trench Power MOSFET

### NDT70N06

■ Typical Characteristics

Figure1. Output Characteristics

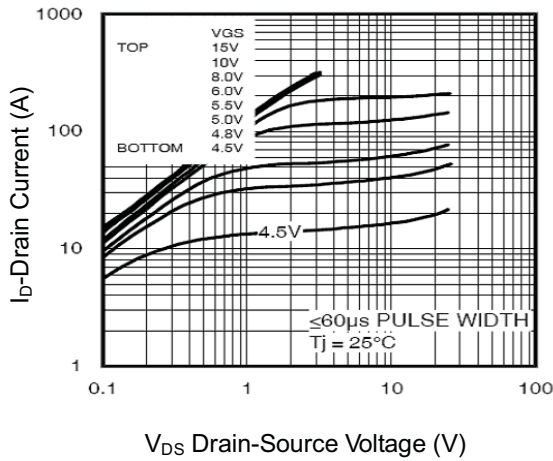


Figure2. Transfer Characteristics

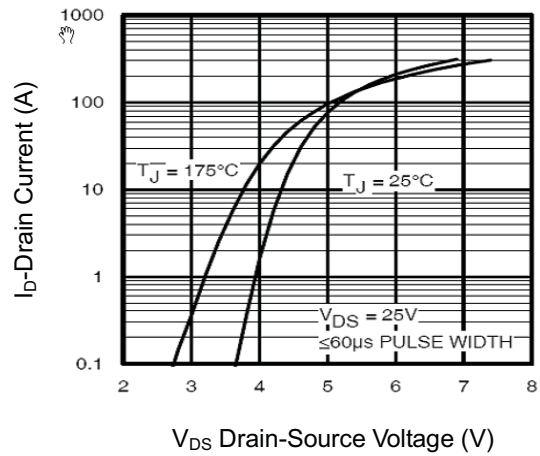


Figure3. BVDS vs Junction Temperature

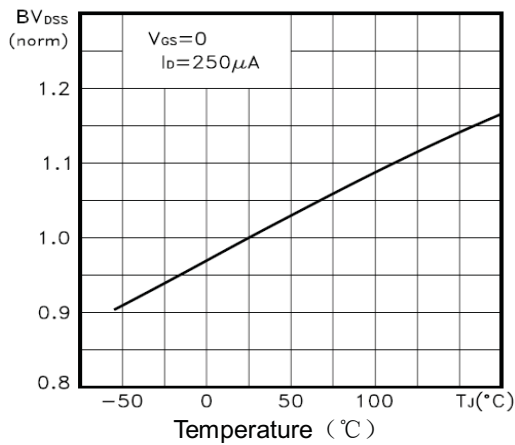


Figure4. ID vs Junction Temperature

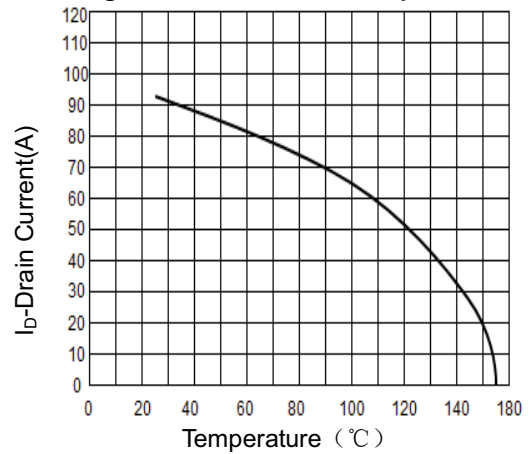


Figure5. VGS(th) vs Junction Temperature

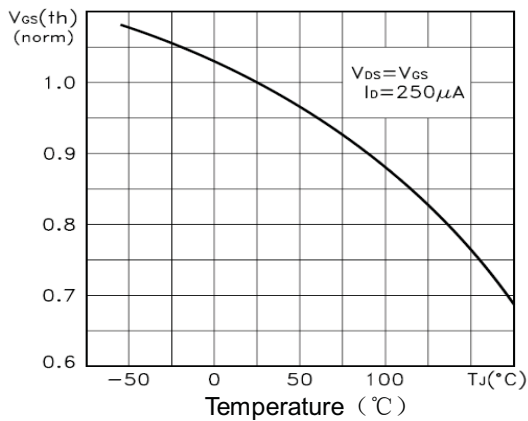
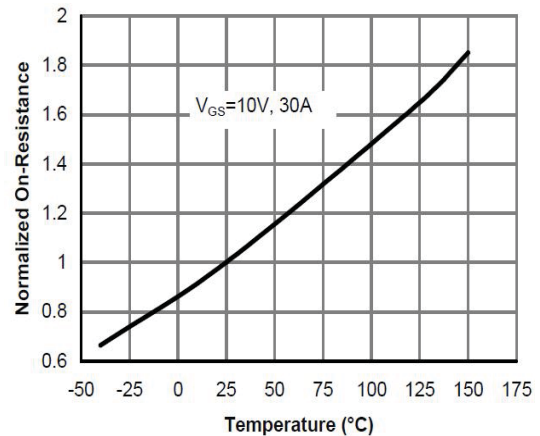


Figure6. Rds(on) Vs Junction Temperature



# N-Channel Trench Power MOSFET

## NDT70N06

■ Typical Characteristics

Figure7. Gate Charge

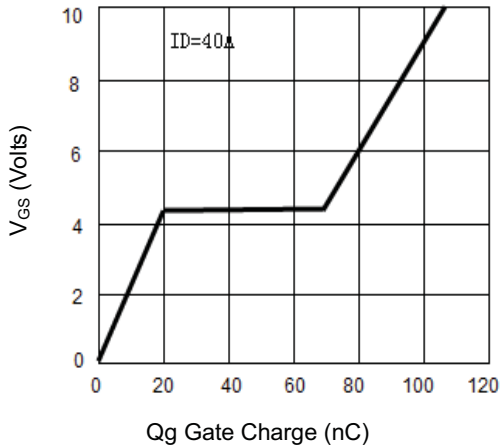


Figure8. Capacitance vs Vds

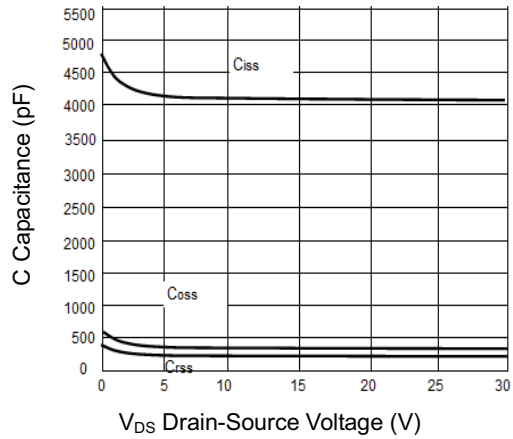


Figure9. Source- Drain Diode Forward

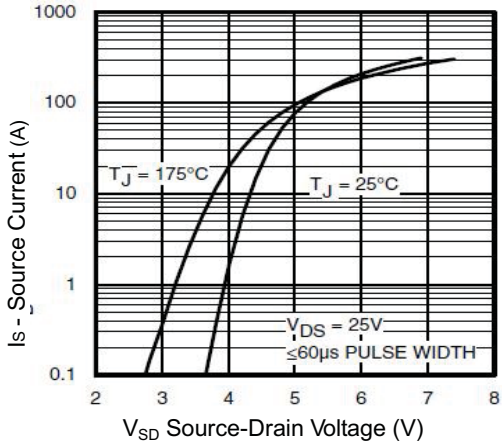


Figure10. Safe Operation Area

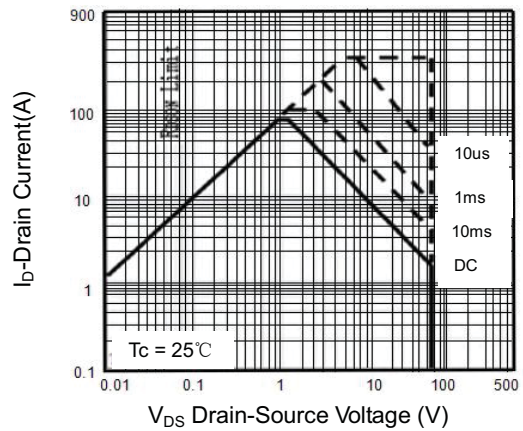


Figure11. Normalized Maximum Transient Thermal Impedance

