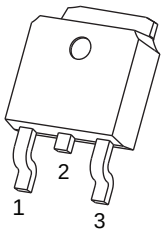
P-Channel MOSFET

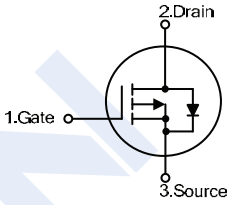
NDT50P06

■ Features

- V_{DS} (V) =-60V
- I_D =-50 A
- $R_{DS(ON)}$ = 25mΩ (typ.) @ V_{GS} = -10V

TO-252





1. Gate (G)
2. Drain (D)
3. Source (S)

■ Absolute Maximum Ratings (T_a = 25°C, unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current *1	I_D	-50	A
Pulsed Drain Current *2	I_{DM}	-200	
Single Pulse Avalanche Energy *3	E_{AS}	196	mJ
Power Dissipation *1	P_D	75	W
Thermal Resistance, Junction- to-Ambient *4	$R_{\theta JA}$	100	℃/W
Thermal Resistance, Junction- to-Case *1	$R_{\theta JC}$	1.66	
Junction Temperature	T_J	150	℃
Junction Storage Temperature Range	T_{stg}	-55 to 150	

Notes: 1. T_C=25℃ Limited only by maximum temperature allowed.

2. P_W≤10μs, Duty cycle≤1%.
3. EAS condition: V_{DD}=-15V,V_{GS}=-10V, L=0.5mH, R_g=25Ω Starting T_J = 25°℃.
4. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with Ta=25℃.

P-Channel MOSFET

NDT50P06

■ Electrical Characteristics (T_a = 25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=-250μA, V_{GS}=0V	-60			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-48V, V_{GS}=0V, T_J=25℃			-1	μA
		V_{DS}=-48V, V_{GS}=0V, T_J=125℃			-100	
Gate-Body Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
On characteristics [*5]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} , I_D=-250μA	-1		-3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=-10V, I_D=-20A		25	30	mΩ
Dynamic characteristics [*5,6]						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-25V, f=1MHz		4500	7500	pF
Output Capacitance	C_{oss}			705	950	
Reverse Transfer Capacitance	C_{rss}			515	760	
Gate resistance	R_g	f=1MHz		5.7		Ω
Switching characteristics [*5,6]						
Total Gate Charge	Q_g	V_{GS}=-10V, V_{DS}=-30V, I_D=-20A		72	130	nC
Gate Source Charge	Q_{gs}			15	29	
Gate Drain Charge	Q_{gd}			17	32	
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=-30V, R_G=3Ω, R_L=1.5Ω, V_{GS}=-10V		16	30	ns
Turn-On Rise Time	t_r			18	35	
Turn-Off Delay Time	$t_{d(off)}$			39	78	
Turn-Off Fall Time	t_f			44	87	
Drain-Source Diode Characteristics [*5]						
Maximum Body-Diode Continuous Current	I_S				-50	A
Maximum Body-Diode Pulsed Current	I_{SM}				-200	
Diode Forward Voltage	V_{SD}	I_S = -20A,V_{GS}=0V			-1.2	V

Notes: 5. Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.

6. Guaranteed by design, not subject to production.

■ Marking

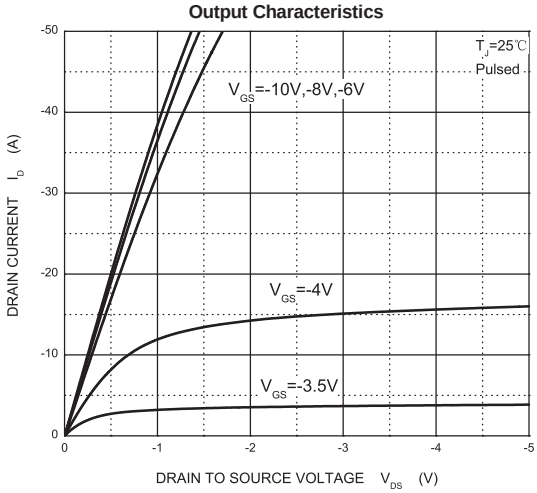
NDT50P06	50P06 K***

P-Channel MOSFET

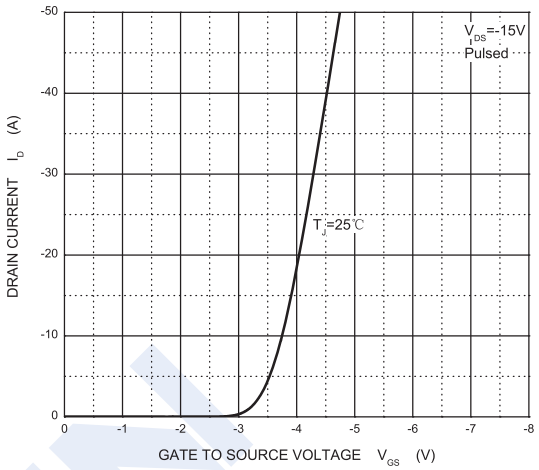
NDT50P06

■ Typical Characterisitics

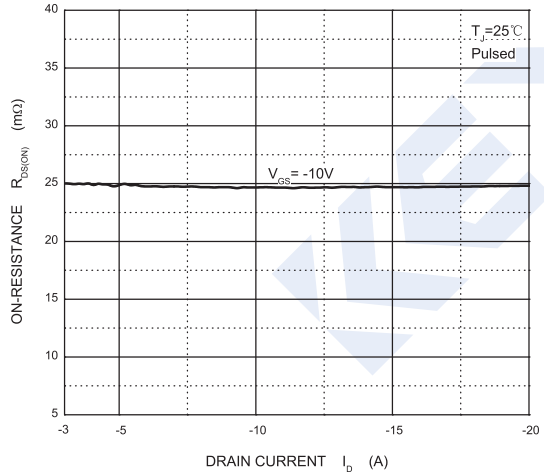
Output Characteristics



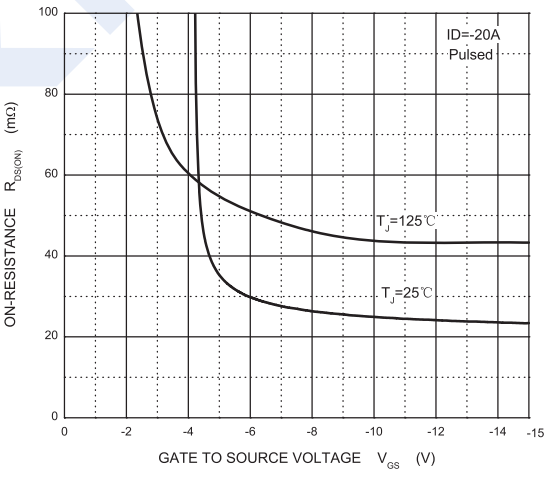
Transfer Characteristics



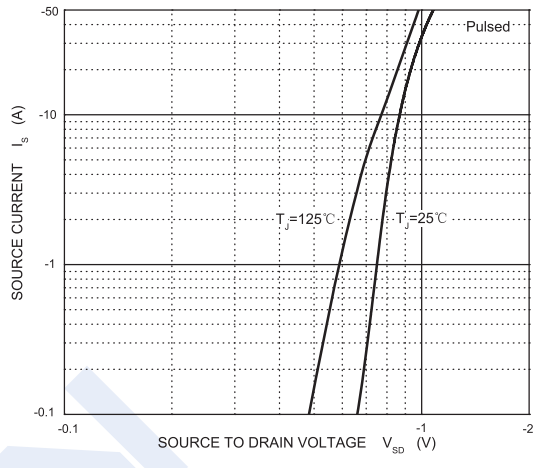
$R_{DS(ON)}$ —— I_D



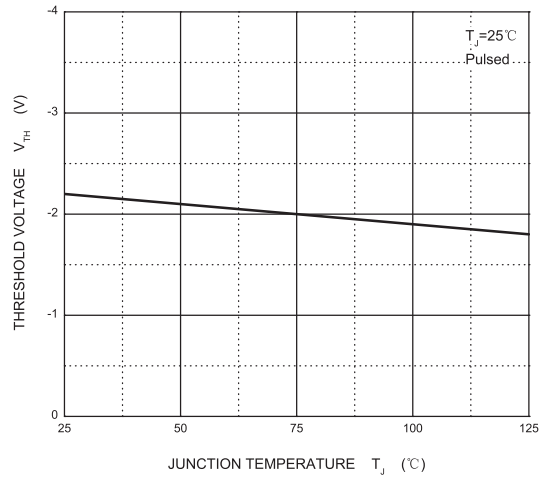
$R_{DS(ON)}$ —— V_{GS}



I_S —— V_{SD}

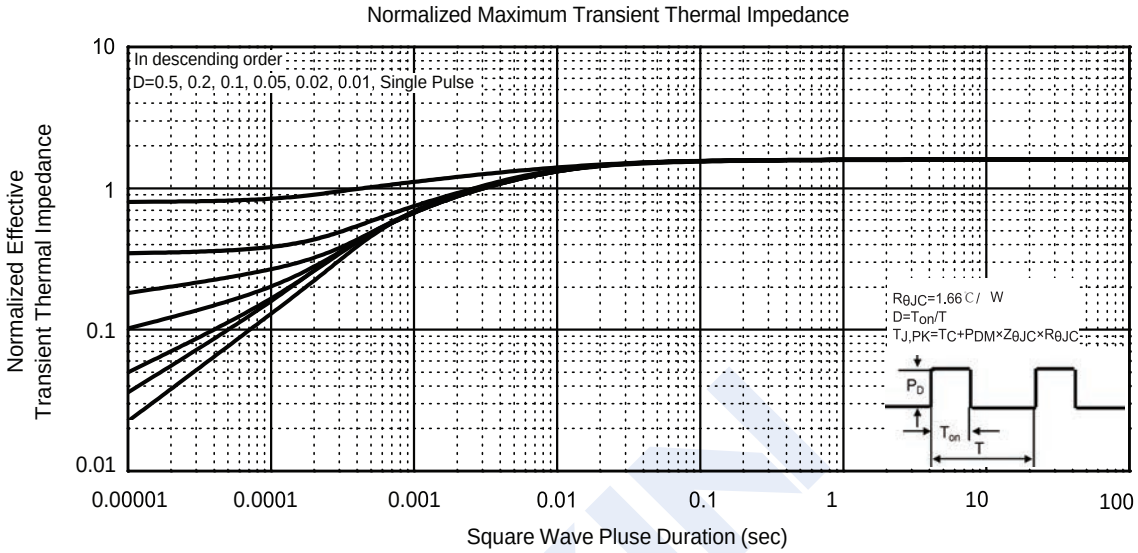


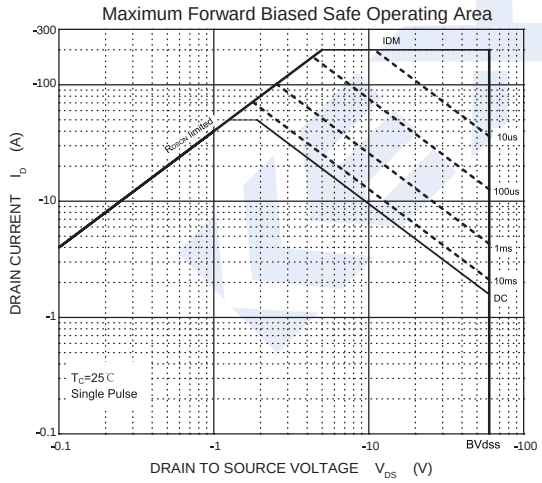
Threshold Voltage



P-Channel MOSFET

NDT50P06

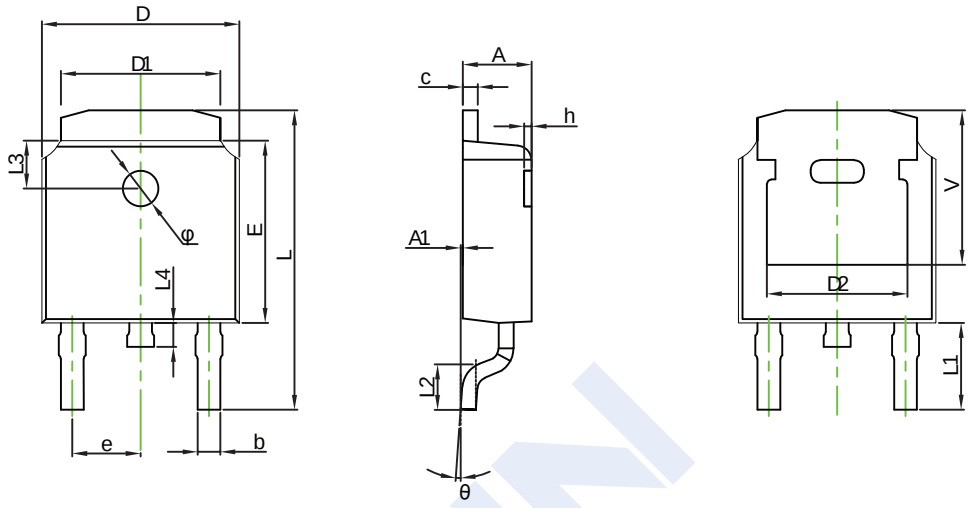




P-Channel MOSFET

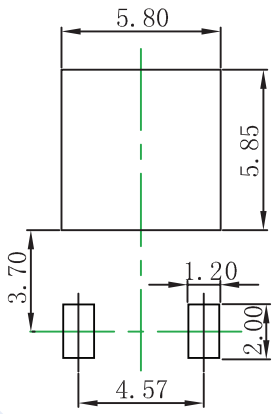
NDT50P06

■ TO-252 Package Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

■ TO-252 Suggested Pad Layout



Note:
1.Controlling dimension: in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.