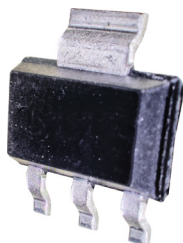


RoHS
Compliant



Features

- $V_{DS(V)} = -30V$
- $I_D = -7.5A$
- $R_{DS(ON)} < 30m\Omega$ ($V_{GS} = -10V$)
- $R_{DS(ON)} < 45m\Omega$ ($V_{GS} = -4.5V$)

Absolute Maximum Ratings ($T_a = 25^\circ C$)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current (Note 1a)	I_D	-7.5	A
Pulsed Drain Current	I_{DM}	-20	
Continuous Drain-Source Diode Forward Current	I_S	-2.5	
Maximum Power Dissipation	(Note 1a)	3	W
	(Note 1b)	1.3	
	(Note 1c)	1.1	
Thermal Resistance, Junction- to-Ambient (Note 1a)	$R_{\theta JA}$	42	$^\circ C/W$
Thermal Resistance, Junction- to-Case (Note 1)	$R_{\theta JC}$	12	
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to + 150	$^\circ C$

Note 1: $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is defined by users. For general reference: Applications on 4.5" x 5" FR-4 PCB under still air environment. typical $R_{\theta JA}$ is found to be:

- 42 $^\circ C/W$ when mounted on a 1 in² pad of 2oz copper.
- 95 $^\circ C/W$ when mounted on a 0.066in² pad of 2oz copper.
- 110 $^\circ C/W$ when mounted on a 0.00123in² pad of 2oz copper.

Electrical Characteristics ($T_A = 25^\circ C$ unless otherwise noted)

Characteristic	Symbol	Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-to-Source Breakdown Voltage	V_{DSS}	$I_D = 250\mu A, V_{GS} = 0V$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -24V, V_{GS} = 0V$			-1	μA
		$V_{DS} = -24V, V_{GS} = 0V, T_J = 55^\circ C$			-10	
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
On Characteristics (Note 1)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1	-1.5	-3	V

Characteristic	Symbol	Conditions	Min	Typ	Max	Unit
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =-10V, I _D =-7.5A			30	mΩ
		V _{GS} =-10V, I _D =-7.5A, T _J = 125°C			54	
		V _{GS} =-4.5V, I _D =-6A			45	
On-State Drain Current	I _{D(on)}	V _{GS} = -10 V, V _{DS} = - 5 V	-20			A
		V _{GS} = -4.5 V, V _{DS} = - 5 V	-10			
Forward Transconductance	g _{FS}	V _{DS} =-10V, I _D =-7.5A		13		S
Dynamic Characteristics (Note 2)						
Input Capacitance	C _{iss}	V _{DS} =-15V, V _{GS} =0V, f=1MHz		1440		pF
Output Capacitance	C _{oss}			905		
Reverse Transfer Capacitance	C _{rSS}			355		
Switching Characteristics (Note 2)						
Turn-On Delay Time	t _{d(on)}	V _{DD} = -15 V, I _D = -7 A, V _{GEN} = -10 V, R _{GEN} = 12Ω		10	20	nS
Turn-On Rise Time	t _r			65	120	
Turn-Off Delay Time	t _{d(off)}			70	130	
Turn-Off Fall Time	t _f					
Total Gate Charge	Q _g	V _{DS} = -10 V, I _D = -7.5 A, V _{GS} = -10 V		47	67	nC
Gate Source Charge	Q _{gs}			5		
Gate Drain Charge	Q _{gd}			12		
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 2)	V _{SD}	I _{SD} =-2.5A, V _{GS} =0V			-1.2	V
Reverse Recovery Time	t _{rr}	V _{GS} =0V, I _F =-2.5 A, dI _F /dt=100 A/μs			100	nS

NOTES:

1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
2. Guaranteed by design, not subject to production

Typical Characteristics

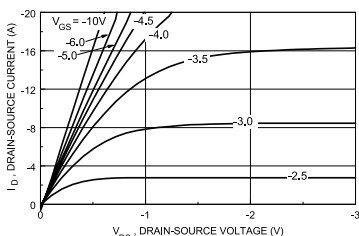


Figure 1. On-Region Characteristics.

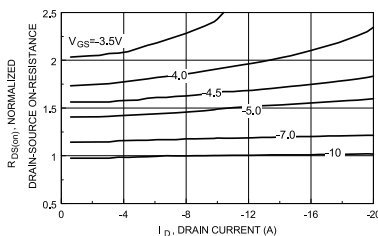


Figure 2. On-Resistance Variation with Gate Voltage and Drain Current.

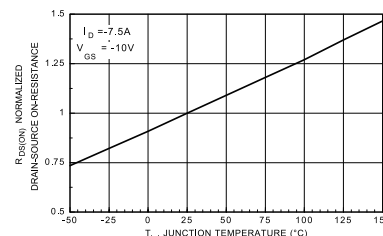


Figure 3. On-Resistance Variation with Temperature.

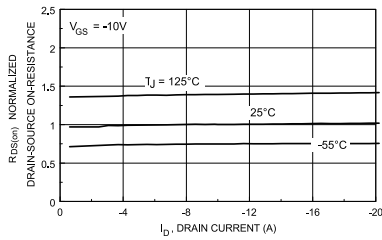


Figure 4. On-Resistance Variation with Drain Current and Temperature.

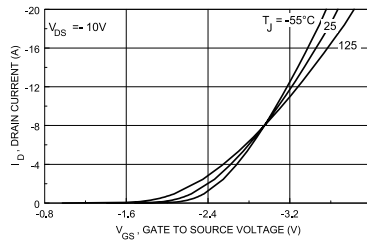


Figure 5. Transfer Characteristics.

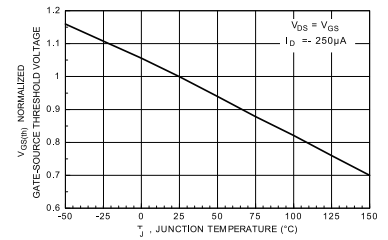


Figure 6. Gate Threshold Variation with Temperature.

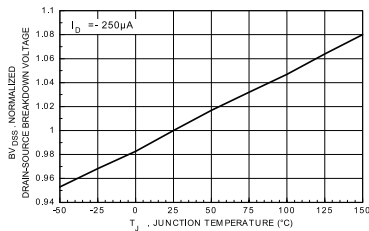


Figure 7. Breakdown Voltage Variation with Temperature.

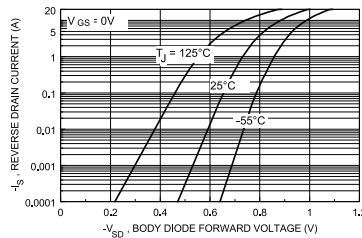


Figure 8. Body Diode Forward Voltage Variation with Current and Temperature.

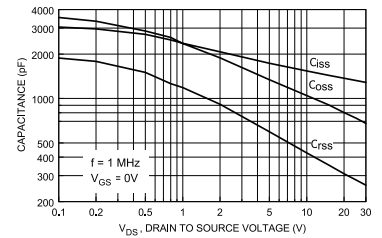


Figure 9. Capacitance Characteristics.

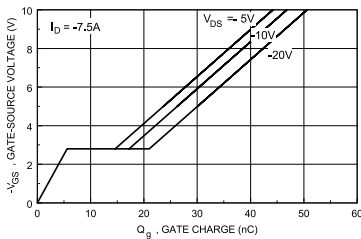


Figure 10. Gate Charge Characteristics.

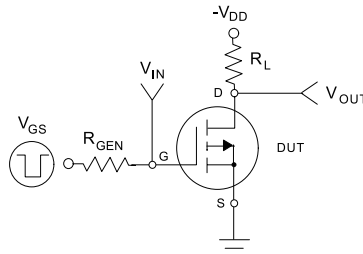


Figure 11. Switching Test Circuit.

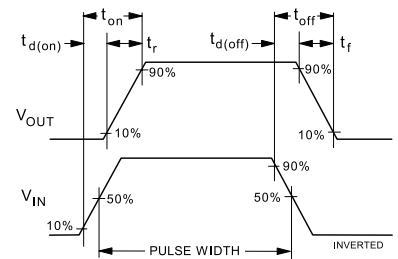


Figure 12. Switching Waveforms.

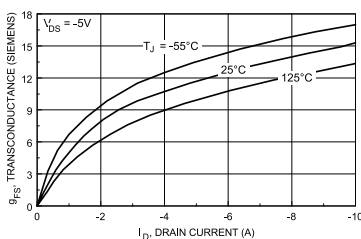


Figure 13. Transconductance Variation with Drain Current and Temperature.

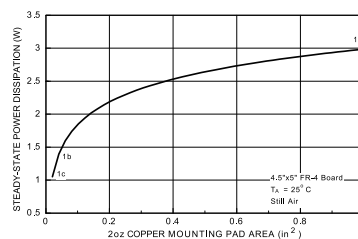


Figure 14. SOT-223 Maximum Steady-State Power Dissipation versus Copper Mounting Pad Area.

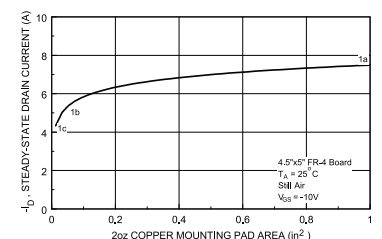


Figure 15. Maximum Steady-State Drain Current versus Copper Mounting Pad Area.

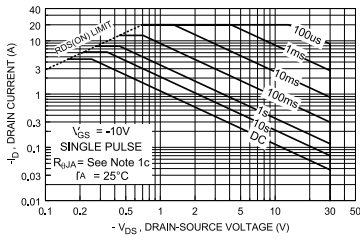


Figure 16. Maximum Safe Operating Area.

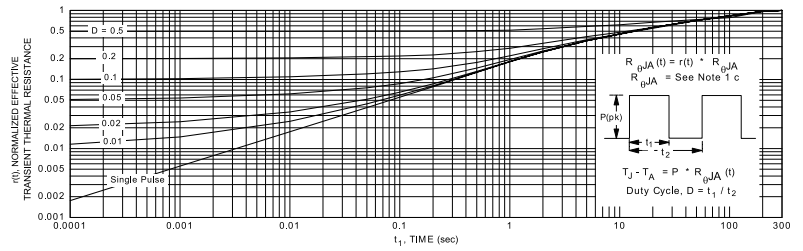
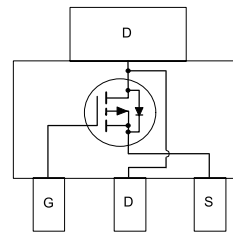
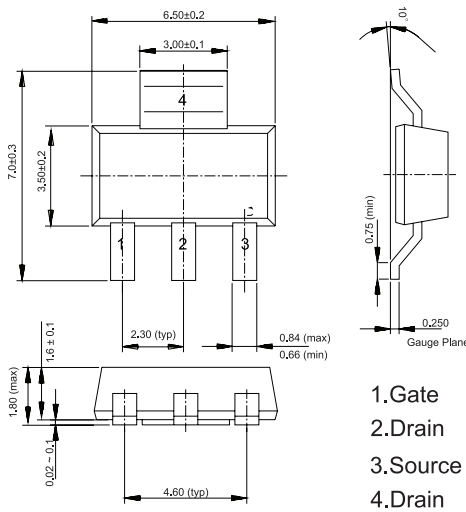


Figure 17. Transient Thermal Response Curve.
Note: Thermal characterization performed using the conditions described in note 1c. Transient thermal response will change depending on the circuit board design.

Diagram



Part Number Table

Description	Part Number
P Channel MOSFET, 5A, -7.5V, -30V	NDT452AP

Dimensions : Millimetres

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