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FAIRCHILD

NDT2955

P-Channel Enhancement Mode Field Effect Transistor

General Description

This 60V P-Channel MOSFET is produced using Fairchild Semiconductor's high voltage Trench process. It has been optimized for power management plications.

Applications

- DC/DC converter
- Power management

Features

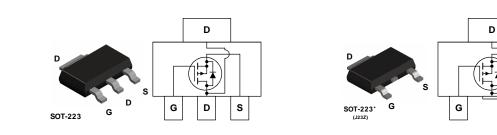
• -2.5 A, -60 V. $R_{\text{DS(ON)}}$ = 300m Ω @ V_{GS} = -10 V

 $R_{DS(ON)} = 500 m\Omega$ @ $V_{GS} = -4.5 V$

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- High density cell design for extremely low R_{DS(ON)}
- High power and current handling capability in a widely used surface mount package.



Absolute Maximum Ratings T_A=25°C unless otherwise noted

Symbol	Parameter		Ratings	Units		
V _{DSS}	Drain-Source	e Voltage		-60		
V _{GSS}	Gate-Sourc	e Voltage		±20	V	
I _D	Drain Curre	nt – Continuous	(Note 1a)	-2.5	А	
	– Pulsed			–15		
P _D	Maximum Power Dissipation		(Note 1a)	3.0	W	
			(Note 1b)	1.3		
			(Note 1c)	1.1		
T _J , T _{STG}	Operating and Storage Junction Temperature Range			-55 to +150	°C	
Therma	I Charac	teristics				
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambier		mbient (Note 1a)	42	°C/W	
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case (Not		ase (Note 1)	12		
Packag	e Markin	g and Ordering	g Information			
Device Marking		Device	Reel Size	Tape width	Quantity	
2955		NDT2955	13"	12mm	2500 units	

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NDT2955

Symbol	Parameter	Test Conditions	Min	Тур	Max	Units
Avalanc	he Ratings					
W _{DSS}	Drain-Source Avalanche Energy	Single Pulse, $V_{DD} = 30$ V, $I_D = 2.5$ A			174	mJ
Off Char	racteristics				1	
BV _{DSS}	Drain–Source Breakdown Voltage	$V_{GS} = 0 V$, $I_D = -250 \mu A$	-60			V
<u>ΔBV_{DSS}</u> ΔT _J	Breakdown Voltage Temperature Coefficient	$I_D = -250 \ \mu\text{A}$, Referenced to 25°C		-60		mV/°C
I _{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = -60 \text{ V}, V_{GS} = 0 \text{ V}$			-10	μA
I _{GSSF}	Gate-Body Leakage, Forward	$V_{GS} = -20 \text{ V}, V_{DS} = 0 \text{ V}$			100	nA
I _{GSSR}	Gate-Body Leakage, Reverse	$V_{GS} = -20 \text{ V}, V_{DS} = 0 \text{ V}$			-100	nA
On Char	acteristics (Note 2)					
V _{GS(th)}	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = -250 \ \mu A$	-2	-2.6	-4	V
$\Delta V_{GS(th)} \Delta T_J$	Gate Threshold Voltage Temperature Coefficient	$I_D = -250 \ \mu\text{A}$, Referenced to 25°C		5.7		mV/°C
R _{DS(on)}	Static Drain–Source On–Resistance			95 163 153	300 500 513	mΩ
I _{D(on)}	On-State Drain Current	$V_{GS} = -10 \text{ V}, V_{DS} = -5 \text{ V}$	-12			Α
g _{FS}	Forward Transconductance	$V_{DS} = -10 \text{ V}, I_D = -2.5 \text{ A}$		5.5		S
Dynamic	c Characteristics					
Ciss	Input Capacitance $V_{DS} = -30 \text{ V}, V_{GS} = 0 \text{ V},$			601		pF
Coss	Output Capacitance	f = 1.0 MHz		85		pF
C _{rss}	Reverse Transfer Capacitance			35		pF
Switchir	ng Characteristics (Note 2)					
t _{d(on)}	Turn–On Delay Time	$V_{DD} = -30 V$, $I_D = -1 A$,		12	21	ns
t _r	Turn–On Rise Time	$V_{GS} = -10 \text{ V}, R_{GEN} = 6 \Omega$		10	20	ns
t _{d(off)}	Turn–Off Delay Time			19	34	ns
t _f	Turn–Off Fall Time			6	12	ns
Qg	Total Gate Charge	$V_{DS} = -30 \ V, I_D = -2.5 \ A,$		11	15	nC
Q _{gs}	Gate-Source Charge	$V_{GS} = -10 \text{ V}$		2.4		nC
Q _{gd}	Gate-Drain Charge			2.7		nC
Drain-S	ource Diode Characteristics	and Maximum Ratings				
Is	Maximum Continuous Drain–Source Diode Forward Current				-2.5	Α
V_{SD}	Drain–Source Diode Forward Voltage	$V_{GS} = 0 V$, $I_S = -2.5 A$ (Note 2)		-0.8	-1.2	V
t _{rr}	Diode Reverse Recovery Time	$I_{\rm F} = -2.5 {\rm A},$		25		nS
Q _{rr}	Diode Reverse Recovery Charge	rse Recovery Charge $d_{iF}/d_t = 100 \text{ A/}\mu\text{s}$		40		nC



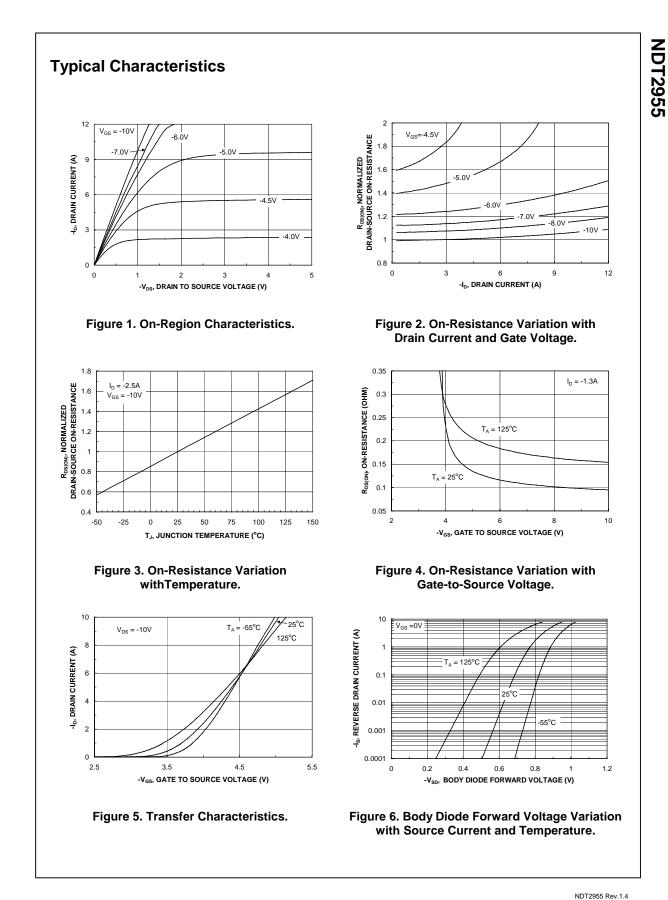
a) 42°C/W when mounted on a 1in² pad of 2 oz copper

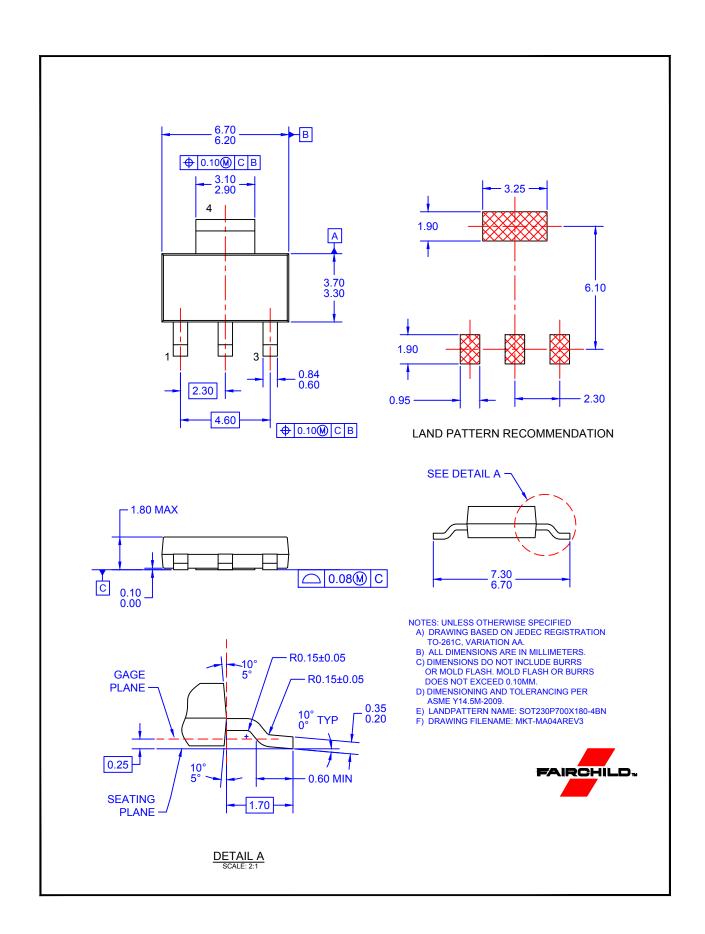
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 b) 95°C/W when mounted on a .0066 in² pad of 2 oz copper ľ III

c) 110°C/W when mounted on a minimum pad.

2. Pulse Test: Pulse Width < 300 μ s, Duty Cycle < 2.0%





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