



FDP2552

N-Channel PowerTrench® MOSFET 150 V, 37 A, 36 mΩ

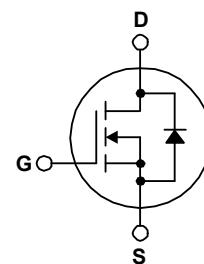
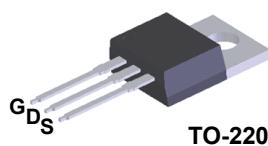
Features

- $R_{DS(on)} = 32 \text{ m}\Omega$ (Typ.) @ $V_{GS} = 10 \text{ V}$, $I_D = 16 \text{ A}$
- $Q_{G(tot)} = 39 \text{ nC}$ (Typ.) @ $V_{GS} = 10 \text{ V}$
- Low Miller Charge
- Low Q_{rr} Body Diode
- UIS Capability (Single Pulse and Repetitive Pulse)

Applications

- Consumer Appliances
- Synchronous Rectification
- Battery Protection Circuit
- Motor drives and Uninterruptible Power Supplies
- Micro Solar Inverter

Formerly developmental type 82869



MOSFET Maximum Ratings $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	FDP2552	Unit
V_{DSS}	Drain to Source Voltage	150	V
V_{GS}	Gate to Source Voltage	± 20	V
I_D	Drain Current Continuous ($T_C = 25^\circ\text{C}$, $V_{GS} = 10\text{V}$)	37	A
	Continuous ($T_C = 100^\circ\text{C}$, $V_{GS} = 10\text{V}$)	26	A
	Continuous ($T_{amb} = 25^\circ\text{C}$, $V_{GS} = 10\text{V}$) with $R_{\theta JA} = 43^\circ\text{C/W}$	5	A
	Pulsed	Figure 4	A
E_{AS}	Single Pulse Avalanche Energy (Note 1)	390	mJ
P_D	Power dissipation	150	W
	Derate above 25°C	1.0	W/ $^\circ\text{C}$
T_J , T_{STG}	Operating and Storage Temperature	-55 to 175	$^\circ\text{C}$

Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance Junction to Case, Max.	1.0	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (Note 2), Max.	62	$^\circ\text{C/W}$

Package Marking and Ordering Information

Device Marking	Device	Package	Reel Size	Tape Width	Quantity
FDP2552	FDP2552	TO-220	Tube	N/A	50 units

Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
--------	-----------	-----------------	-----	-----	-----	------

Off Characteristics

$B_{V_{DSS}}$	Drain to Source Breakdown Voltage	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	150	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 120\text{V}$	-	-	1	μA
		$V_{GS} = 0\text{V}$ $T_C = 150^\circ\text{C}$	-	-	250	
I_{GSS}	Gate to Source Leakage Current	$V_{GS} = \pm 20\text{V}$	-	-	± 100	nA

On Characteristics

$V_{GS(\text{TH})}$	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	2	-	4	V
$r_{DS(\text{ON})}$	Drain to Source On Resistance	$I_D = 16\text{A}, V_{GS} = 10\text{V}$	-	0.032	0.036	Ω
		$I_D = 8\text{A}, V_{GS} = 6\text{V}$	-	0.036	0.054	
		$I_D = 16\text{A}, V_{GS} = 10\text{V}, T_J = 175^\circ\text{C}$	-	0.084	0.097	

Dynamic Characteristics

C_{ISS}	Input Capacitance	$V_{DS} = 25\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$	-	2800	-	pF	
C_{OSS}	Output Capacitance		-	285	-	pF	
C_{RSS}	Reverse Transfer Capacitance		-	55	-	pF	
$Q_{g(\text{TOT})}$	Total Gate Charge at 10V	$V_{GS} = 0\text{V to } 10\text{V}$		39	51	nC	
$Q_{g(\text{TH})}$	Threshold Gate Charge	$V_{GS} = 0\text{V to } 2\text{V}$	$V_{DD} = 75\text{V}$ $I_D = 16\text{A}$ $I_g = 1.0\text{mA}$	-	5.2	6.8	nC
Q_{gs}	Gate to Source Gate Charge	-		13.5	-	nC	
Q_{gs2}	Gate Charge Threshold to Plateau	-		8.4	-	nC	
Q_{gd}	Gate to Drain "Miller" Charge	-		8.3	-	nC	

Switching Characteristics ($V_{GS} = 10\text{V}$)

t_{ON}	Turn-On Time	$V_{DD} = 75\text{V}, I_D = 16\text{A}$ $V_{GS} = 10\text{V}, R_{GS} = 8.2\Omega$	-	-	62	ns
$t_{d(\text{ON})}$	Turn-On Delay Time		-	12	-	ns
t_r	Rise Time		-	29	-	ns
$t_{d(\text{OFF})}$	Turn-Off Delay Time		-	36	-	ns
t_f	Fall Time		-	29	-	ns
t_{OFF}	Turn-Off Time		-	-	97	ns

Drain-Source Diode Characteristics

V_{SD}	Source to Drain Diode Voltage	$I_{SD} = 16\text{A}$	-	-	1.25	V
		$I_{SD} = 8\text{A}$	-	-	1.0	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 16\text{A}, dI_{SD}/dt = 100\text{A}/\mu\text{s}$	-	-	90	ns
Q_{RR}	Reverse Recovered Charge	$I_{SD} = 16\text{A}, dI_{SD}/dt = 100\text{A}/\mu\text{s}$	-	-	242	nC

Notes:

1: Starting $T_J = 25^\circ\text{C}$, $L = 7.8\text{mH}$, $I_{AS} = 10\text{A}$.

2: Pulse Width = 100s

Typical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

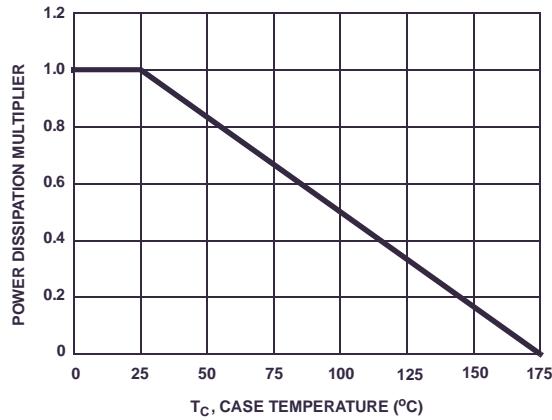


Figure 1. Normalized Power Dissipation vs Ambient Temperature

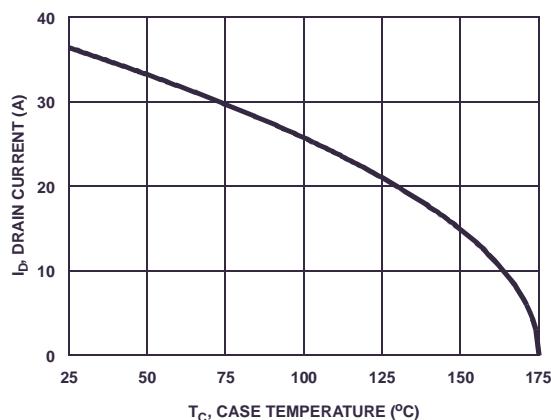


Figure 2. Maximum Continuous Drain Current vs Case Temperature

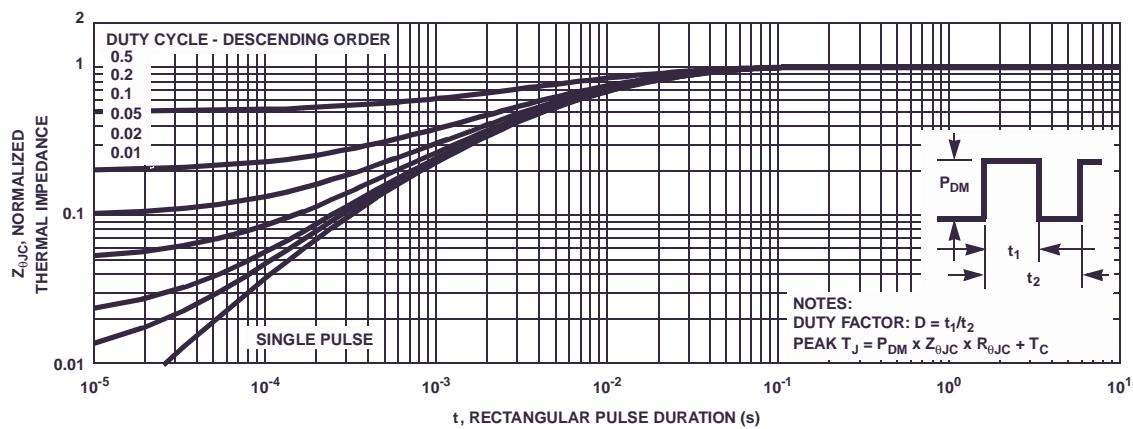


Figure 3. Normalized Maximum Transient Thermal Impedance

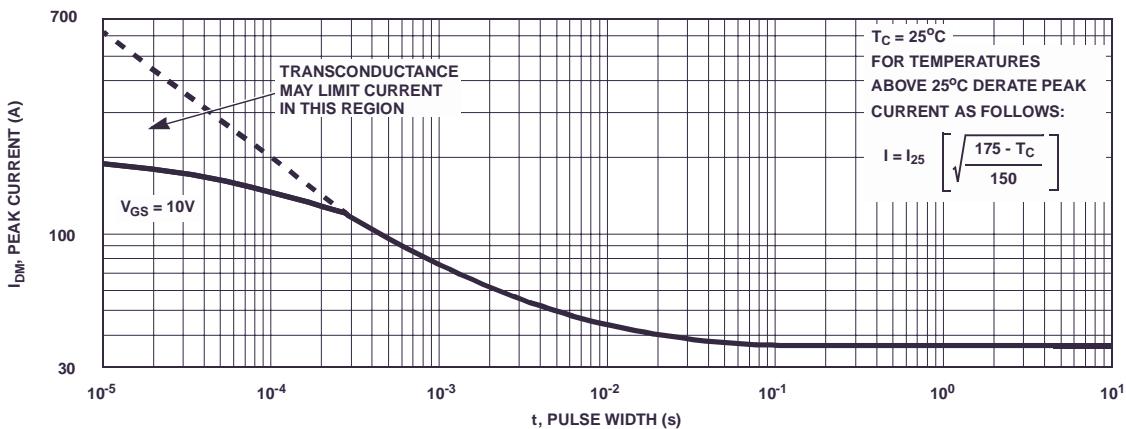


Figure 4. Peak Current Capability