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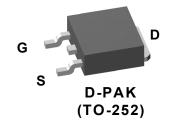
ON Semiconductor®

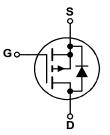
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| FAIRCHILD FDD4243 40V P-Channel PowerTrench ⁰ -40V, -14A, 44mΩ | ® MOSFET |
|--|--|
| Features | General Description |
| ■ Max $r_{DS(on)}$ = 44m Ω at V_{GS} = -10V, I_D = -6.7A ■ Max $r_{DS(on)}$ = 64m Ω at V_{GS} = -4.5V, I_D = -5.5A ■ High performance trench technology for extremely low $r_{DS(on)}$ | This P-Channel MOSFET has been produced using Fairchild Semiconductor's proprietary PowerTrench [®] technology to deliver low r _{DS(on)} and optimized Bvdss capability to offer superior performance benefit in the applications. |
| RoHS Compliant | Application Inverter |

Power Supplies





MOSFET Maximum Ratings T_C = 25°C unless otherwise noted

| Symbol | Parameter | | | Ratings | Units | |
|-----------------------------------|---|-----------------------|-----------|-------------|-------|--|
| V _{DS} | Drain to Source Voltage | | | -40 | V | |
| V _{GS} | Gate to Source Voltage | | | ±20 | V | |
| | Drain Current -Continuous (Package limited) | T _C = 25°C | | -14 | | |
| , | -Continuous (Silicon limited) | T _C = 25°C | (Note 1) | -24 | • | |
| D | -Continuous | T _A = 25°C | (Note 1a) | -6.7 | Α | |
| | -Pulsed | | | -60 | | |
| E _{AS} | Single Pulse Avalanche Energy | | (Note 3) | 84 | mJ | |
| D | Power Dissipation | T _C = 25°C | | 42 | W | |
| P _D | Power Dissipation | | (Note 1a) | 3 | | |
| T _J , T _{STG} | Operating and Storage Junction Temperature Rang | je | | -55 to +150 | °C | |

Thermal Characteristics

| $R_{\theta JC}$ | Thermal Resistance, Junction to Case | 3.0 | °C/W |
|---------------------|---|-------|------|
| $R_{	ext{	heta}JA}$ | Thermal Resistance, Junction to Ambient (Note 1 | a) 40 | C/VV |

Package Marking and Ordering Information

| Device Marking | Device | Package | Reel Size | Tape Width | Quantity |
|----------------|---------|---------------|-----------|------------|------------|
| FDD4243 | FDD4243 | D-PAK(TO-252) | 13" | 16mm | 2500 units |

| FDD4243 40V |
|--------------------------|
| P-Channel |
| PowerTrench [®] |
| MOSFET |

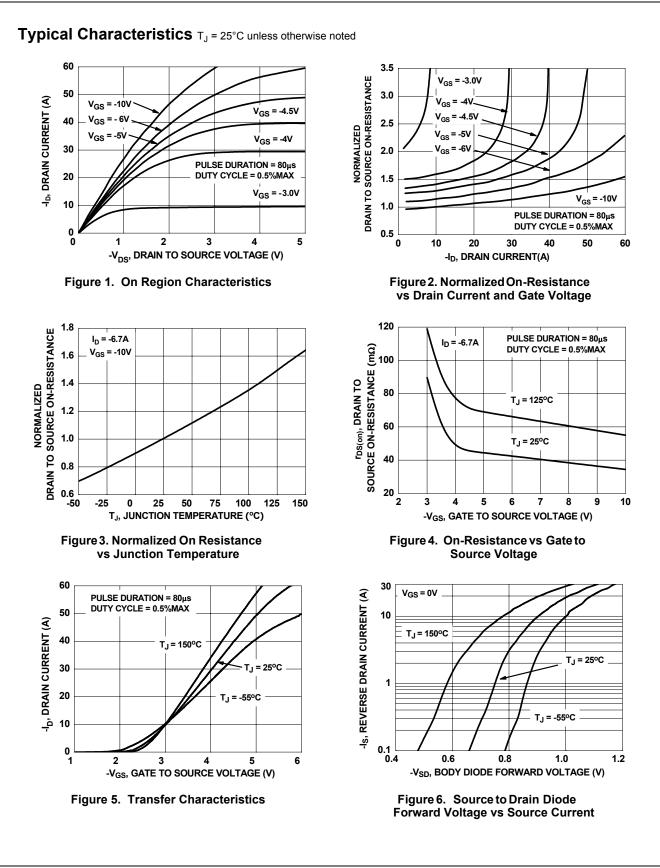
| Symbol | Parameter | Test Conditions | Min | Тур | Max | Units |
|--|---|--|------|--|--|---|
| Off Chara | acteristics | | | | | |
| BV _{DSS} | Drain to Source Breakdown Voltage | I_{D} = -250 μ A, V _{GS} = 0V | -40 | | | V |
| ΔBV _{DSS} ΔT _J | Breakdown Voltage Temperature Coefficient | $I_D = -250 \mu A$, referenced to $25^{\circ}C$ | | -32 | | mV/°C |
| DSS | Zero Gate Voltage Drain Current | $V_{DS} = -32V,$ $V_{GS} = 0V$ $T_{J} = 125^{\circ}C$ | | | -1 -100 | μA |
| GSS | Gate to Source Leakage Current | $V_{GS} = \pm 20V, V_{DS} = 0V$ | | | ±100 | nA |
| | acteristics | | | | 1 | 1 |
| V _{GS(th)} | Gate to Source Threshold Voltage | $V_{GS} = V_{DS}, I_{D} = -250 \mu A$ | -1.4 | -1.6 | -3.0 | V |
| $\frac{\Delta V_{GS(th)}}{\Delta T_{.l}}$ | Gate to Source Threshold Voltage Temperature Coefficient | $I_D = -250\mu$ A, referenced to 25°C | | 4.7 | | mV/°C |
| 0 | Drain to Source On Resistance | V _{GS} = -10V, I _D = -6.7A | | 36 | 44 | |
| DS(on) | | V _{GS} = -4.5V, I _D = -5.5A | | 48 | 64 | mΩ |
| 20(01) | | V _{GS} = -10V, I _D = -6.7A, T _J = 125°C | | 53 | 69 | |
| 9 _{FS} | Forward Transconductance | $V_{DS} = -5V, I_{D} = -6.7A$ | | 16 | | S |
| 913 | | $v_{\rm DS} = -3v, \ {\rm ID} = -0.7{\rm A}$ | | 10 | | 5 |
| Dynamic | Characteristics Input Capacitance | | | 1165 | 1550 | pF |
| Dynamic C _{iss} C _{oss} | Characteristics Input Capacitance Output Capacitance | V _{DS} = -30V, V _D = -0.7A | | | 1550 220 | |
| Dynamic C _{iss} C _{oss} C _{rss} | Characteristics | – V _{DS} = -20V, V _{GS} = 0V, f = 1MHz | | 1165 165 90 | | pF |
| Dynamic C _{iss} C _{oss} C _{rss} | Characteristics Input Capacitance Output Capacitance | | | 1165 165 | 220 | pF pF |
| Dynamic C _{iss} C _{oss} C _{rss} | Characteristics Input Capacitance Output Capacitance Reverse Transfer Capacitance | – V _{DS} = -20V, V _{GS} = 0V, f = 1MHz | | 1165 165 90 | 220 | pF pF pF |
| Dynamic C _{iss} C _{oss} C _{rss} R _g Switching | Characteristics Input Capacitance Output Capacitance Reverse Transfer Capacitance Gate Resistance | V _{DS} = -20V, V _{GS} = 0V, f = 1MHz f = 1MHz | | 1165 165 90 | 220 | pF pF pF |
| Dynamic C _{iss} C _{oss} C _{rss} Rg Switching | Characteristics Input Capacitance Output Capacitance Reverse Transfer Capacitance Gate Resistance g Characteristics | $V_{DS} = -20V, V_{GS} = 0V,$ f = 1MHz f = 1MHz $V_{DD} = -20V, I_D = -6.7A$ | | 1165 165 90 4 | 220 135 | pF pF pF Ω |
| Dynamic C _{iss} C _{oss} C _{rss} R _g Switching | Characteristics Input Capacitance Output Capacitance Reverse Transfer Capacitance Gate Resistance g Characteristics Turn-On Delay Time | V _{DS} = -20V, V _{GS} = 0V, f = 1MHz f = 1MHz | | 1165 165 90 4 6 | 220 135 12 | pF pF pF Ω ns |
| Dynamic Ciss Coss Crss Rg Switching d(on) r d(off) | Characteristics Input Capacitance Output Capacitance Reverse Transfer Capacitance Gate Resistance g Characteristics Turn-On Delay Time Rise Time | $V_{DS} = -20V, V_{GS} = 0V,$ f = 1MHz f = 1MHz $V_{DD} = -20V, I_D = -6.7A$ | | 1165 165 90 4 6 15 | 220 135 12 26 | pF pF pF Ω ns |
| Dynamic Ciss Coss Crss Rg Switching d(on) fr d(off) fr | Characteristics Input Capacitance Output Capacitance Reverse Transfer Capacitance Gate Resistance g Characteristics Turn-On Delay Time Rise Time Turn-Off Delay Time | $V_{DS} = -20V, V_{GS} = 0V,$ f = 1MHz f = 1MHz $V_{DD} = -20V, I_{D} = -6.7A$ $V_{GS} = -10V, R_{GEN} = 6\Omega$ | | 1165 165 90 4 6 15 22 | 220 135 12 26 35 | pF pF Ω ns ns |
| Dynamic C _{iss} C _{oss} C _{rss} Rg Switching d(on) f d(off) f Q _{g(TOT)} | Characteristics Input Capacitance Output Capacitance Reverse Transfer Capacitance Gate Resistance g Characteristics Turn-On Delay Time Rise Time Turn-Off Delay Time Fall Time | $V_{DS} = -20V, V_{GS} = 0V,$ f = 1MHz f = 1MHz $V_{DD} = -20V, I_D = -6.7A$ | | 1165 165 90 4 6 15 22 7 | 220 135 12 26 35 14 | pF pF Ω ns ns ns ns |
| Dynamic Ciss Coss Crss Rg Switching Ed(on) Er Ed(off) Ef Qg(TOT) Qgs | Characteristics Input Capacitance Output Capacitance Reverse Transfer Capacitance Gate Resistance g Characteristics Turn-On Delay Time Rise Time Turn-Off Delay Time Fall Time Total Gate Charge at 10V | $V_{DS} = -20V, V_{GS} = 0V,$ f = 1MHz f = 1MHz $V_{DD} = -20V, I_D = -6.7A$ $V_{GS} = -10V, R_{GEN} = 6\Omega$ $V_{DD} = -20V, I_D = -6.7A$ | | 1165 165 90 4 6 15 22 7 21 | 220 135 12 26 35 14 | pF pF Ω ns ns ns ns nc |
| Dynamic C _{iss} C _{oss} C _{rss} R _g Switching td(on) tr td(off) tf Q _{g(TOT)} Q _{gs} Q _{gd} | Characteristics Input Capacitance Output Capacitance Reverse Transfer Capacitance Gate Resistance g Characteristics Turn-On Delay Time Rise Time Turn-Off Delay Time Fall Time Total Gate Charge at 10V Gate to Source Gate Charge | $V_{DS} = -20V, V_{GS} = 0V,$ f = 1MHz f = 1MHz $V_{DD} = -20V, I_D = -6.7A$ $V_{GS} = -10V, R_{GEN} = 6\Omega$ $V_{DD} = -20V, I_D = -6.7A$ | | 1165 165 90 4 6 15 22 7 21 3.4 | 220 135 12 26 35 14 | pF pF pF Ω ns ns ns ns ns nc |
| Dynamic G_{iss} C_{oss} C_{rss} R_g Switching $t_{d(on)}$ t_r $t_{d(off)}$ t_f $Q_{g(TOT)}$ Q_{gg} Q_{gd} Drain-Sol | Characteristics Input Capacitance Output Capacitance Reverse Transfer Capacitance Gate Resistance g Characteristics Turn-On Delay Time Rise Time Turn-Off Delay Time Fall Time Total Gate Charge at 10V Gate to Drain "Miller" Charge | $V_{DS} = -20V, V_{GS} = 0V,$ f = 1MHz f = 1MHz $V_{DD} = -20V, I_D = -6.7A$ $V_{GS} = -10V, R_{GEN} = 6\Omega$ $V_{DD} = -20V, I_D = -6.7A$ | | 1165 165 90 4 6 15 22 7 21 3.4 | 220 135 12 26 35 14 | pF pF pF Ω ns ns ns ns ns nc |
| Dynamic C _{iss} C _{oss} C _{rss} R _g Switching t _d (on) t _r t _d (off) t _f Q _{g(TOT)} Q _{gs} Q _{gd} | Characteristics Input Capacitance Output Capacitance Reverse Transfer Capacitance Gate Resistance GCharacteristics Turn-On Delay Time Rise Time Turn-Off Delay Time Fall Time Total Gate Charge at 10V Gate to Source Gate Charge Gate to Drain "Miller" Charge Urce Diode Characteristics | $V_{DS} = -20V, V_{GS} = 0V,$ f = 1MHz f = 1MHz $V_{DD} = -20V, I_D = -6.7A$ $V_{GS} = -10V, R_{GEN} = 6\Omega$ $V_{DD} = -20V, I_D = -6.7A$ $V_{GS} = -10V$ | | 1165 165 90 4 6 15 22 7 21 3.4 4 | 220 135 12 26 35 14 29 | pF pF pF ns ns ns ns ns nc nC |

Notes:
 1: R_{0JA} is sum of 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_{0JC} is guaranteed by design while R_{0JC} is determined by the user's board design.

a. 40°C/W when mounted on a 1 in $^2\,\text{pad}$ of 2 oz copper

b. 96°C/W when mounted on $% \mathcal{A}^{(0)}$ a minimum pad.

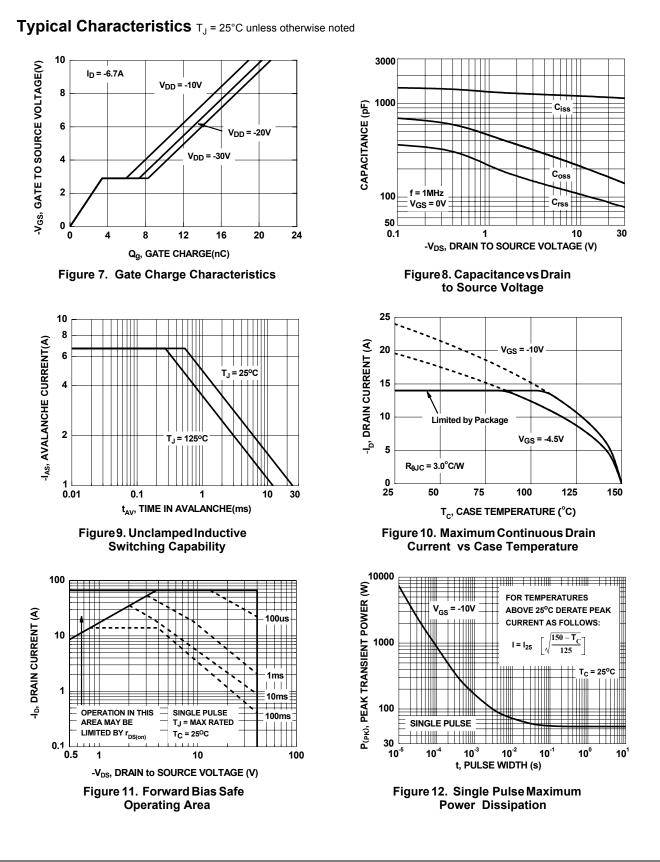
 $2: \mbox{ Pulse Test: Pulse Width < } 300 \mbox{ } \mbox{$



FDD4243 Rev. 1.3

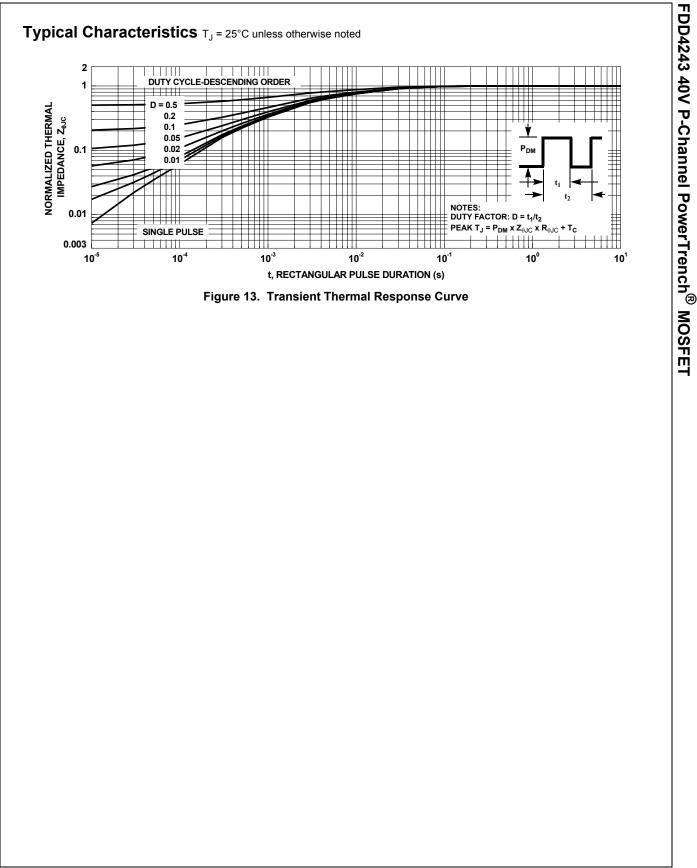
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FDD4243 40V P-Channel PowerTrench[®] MOSFET



FDD4243 Rev. 1.3



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