

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

$B_{V_{DS}}$	Drain to Source Breakdown Voltage	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	60	-	-	V
I_{DSS}	Drain to Source Leakage Current	$V_{DS} = 60\text{V}$, $T_J = 25^\circ\text{C}$ $V_{GS} = 0\text{V}$, $T_J = 175^\circ\text{C}$ (Note 4)	-	-	1	μA
I_{GSS}	Gate to Source Leakage Current	$V_{GS} = \pm 20\text{V}$	-	-	± 100	nA

On Characteristics

$V_{GS(th)}$	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}$, $I_D = 250\mu\text{A}$	1.0	1.9	3.0	V
$r_{DS(on)}$	Drain to Source On Resistance	$I_D = 17.6\text{A}$, $T_J = 25^\circ\text{C}$	-	26	33	$\text{m}\Omega$
		$V_{GS} = 10\text{V}$, $T_J = 175^\circ\text{C}$ (Note 4)	-	59	74	$\text{m}\Omega$
		$I_D = 17.6\text{A}$, $T_J = 25^\circ\text{C}$	-	34	42	$\text{m}\Omega$
		$V_{GS} = 4.5\text{V}$, $T_J = 175^\circ\text{C}$ (Note 4)	-	74	90	$\text{m}\Omega$

Dynamic Characteristics

C _{iss}	Input Capacitance	V _{DS} = 25V, V _{GS} = 0V, f = 1MHz		-	878	-	pF
C _{oss}	Output Capacitance			-	79	-	pF
C _{rss}	Reverse Transfer Capacitance			-	39	-	pF
R _g	Gate Resistance	f = 1MHz		-	2.4	-	Ω
Q _{g(ToT)}	Total Gate Charge at 10V	V _{GS} = 0 to 10V	V _{DD} = 48V I _D = 17.6A	-	17	21	nC
Q _{g(th)}	Threshold Gate Charge	V _{GS} = 0 to 2V		-	8.3	10.5	nC
Q _{gs}	Gate to Source Gate Charge			-	3	-	nC
Q _{gd}	Gate to Drain “Miller” Charge			-	4	-	nC

Switching Characteristics

t_{on}	Turn-On Time	$V_{DD} = 30\text{V}$, $I_D = 17.6\text{A}$, $V_{GS} = 10\text{V}$, $R_{GEN} = 6\Omega$	-	-	17	ns
$t_{d(on)}$	Turn-On Delay Time		-	11	-	ns
t_r	Rise Time		-	4	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	31	-	ns
t_f	Fall Time		-	4	-	ns
t_{off}	Turn-Off Time		-	-	44	ns

Drain-Source Diode Characteristics

V_{SD}	Source to Drain Diode Voltage	$I_{SD} = 17.6\text{A}$, $V_{GS} = 0\text{V}$	-	-	1.25	V
T_{rr}	Reverse Recovery Time	$I_F = 17.6\text{A}$, $dI_{SD}/dt = 100\text{A}/\mu\text{s}$	-	25	38	ns
Q_{rr}	Reverse Recovery Charge	$V_{DD} = 48\text{V}$	-	16.8	22	nC

Notes:

4: The maximum value is specified by design at $T_J = 175^\circ\text{C}$. Product is not tested to this condition in production.

Typical Characteristics

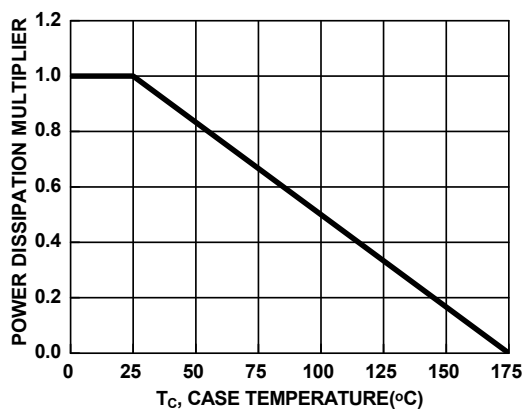


Figure 1. Normalized Power Dissipation vs Case Temperature

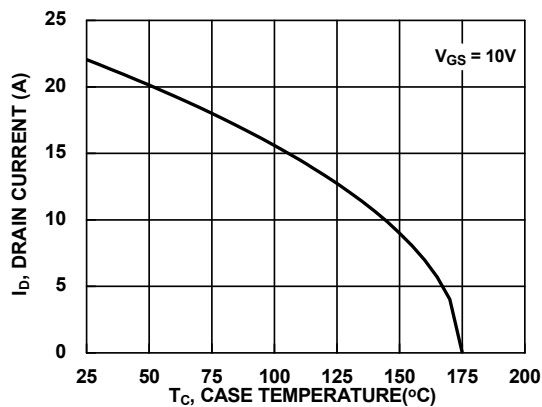


Figure 2. Maximum Continuous Drain Current vs Case Temperature

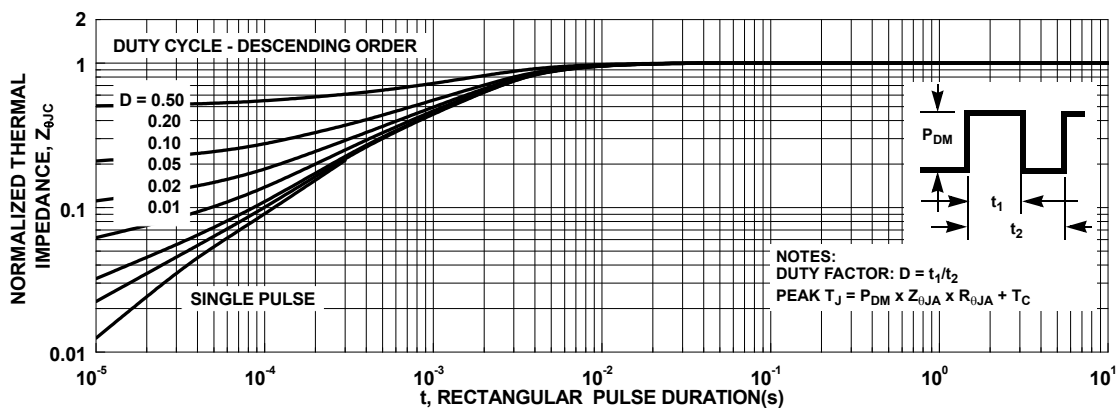


Figure 3. Normalized Maximum Transient Thermal Impedance

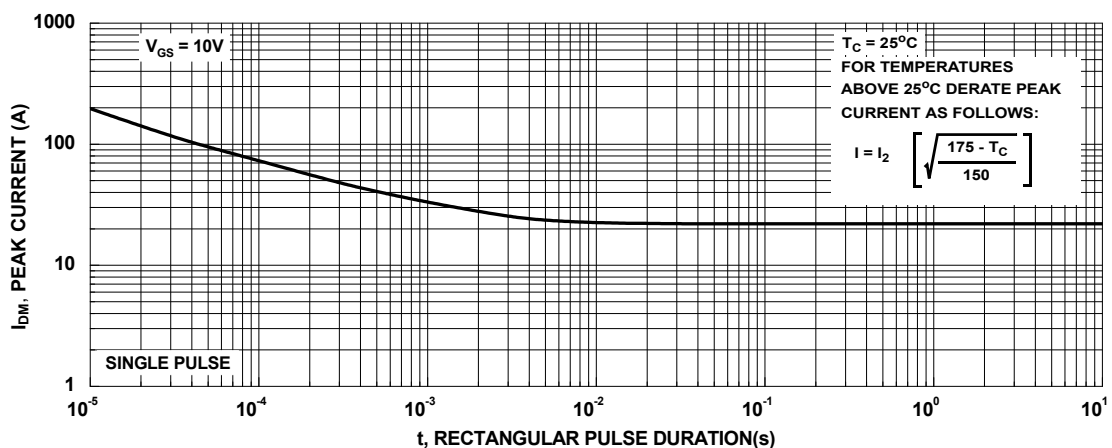


Figure 4. Peak Current Capability

Typical Characteristics

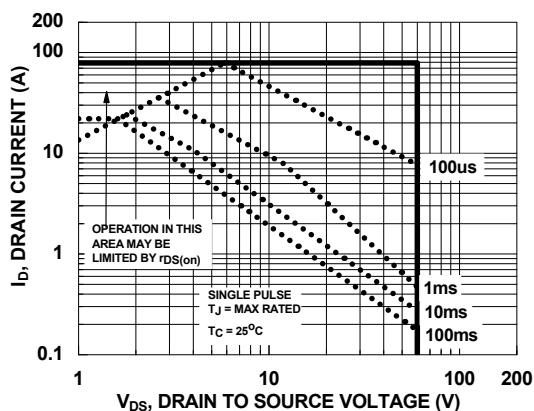
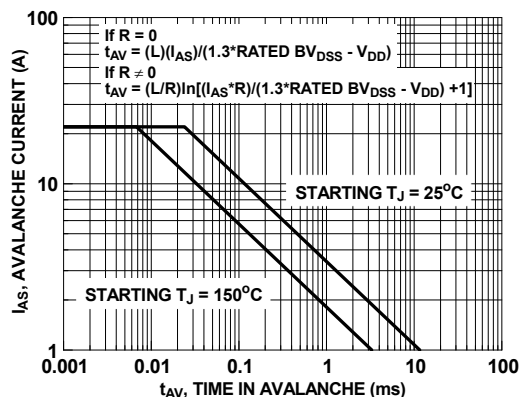


Figure 5. Forward Bias Safe Operating Area



NOTE: Refer to ON Semiconductor Application Notes AN7514 and AN7515

Figure 6. Unclamped Inductive Switching Capability

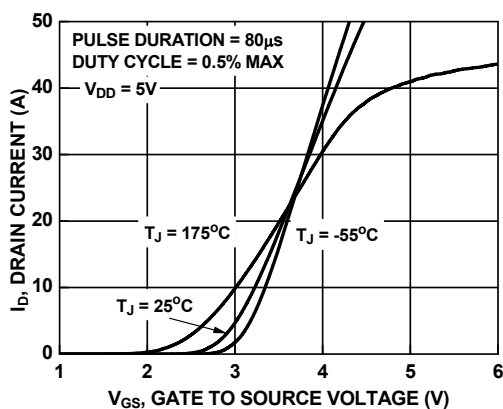


Figure 7. Transfer Characteristics

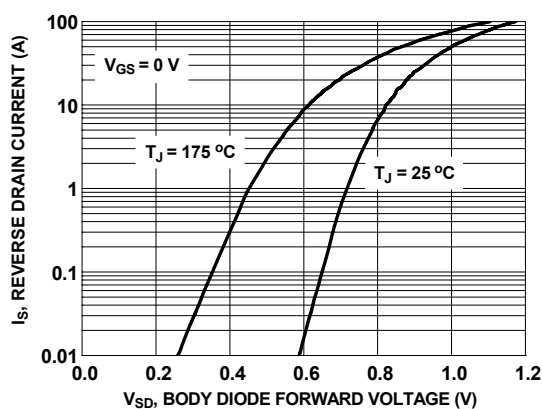


Figure 8. Forward Diode Characteristics

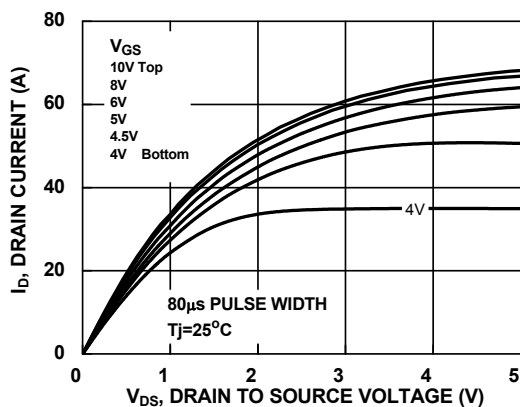


Figure 9. Saturation Characteristics

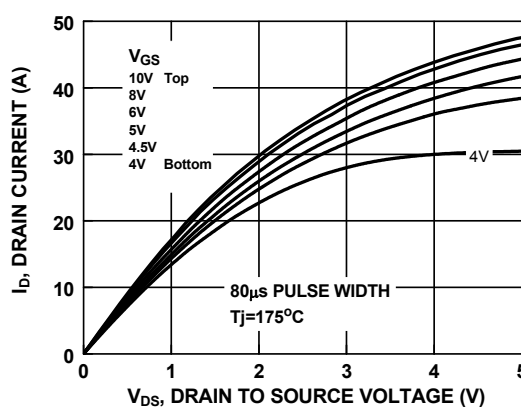


Figure 10. Saturation Characteristics

Typical Characteristics

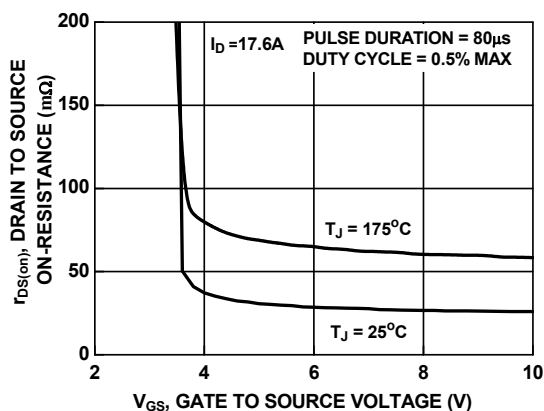


Figure 11. $R_{ds(on)}$ vs Gate Voltage

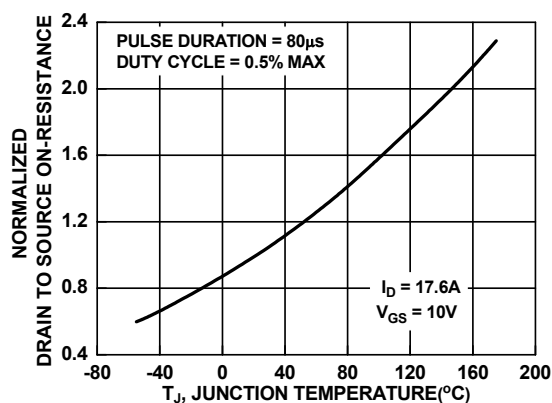


Figure 12. Normalized $R_{ds(on)}$ vs Junction Temperature

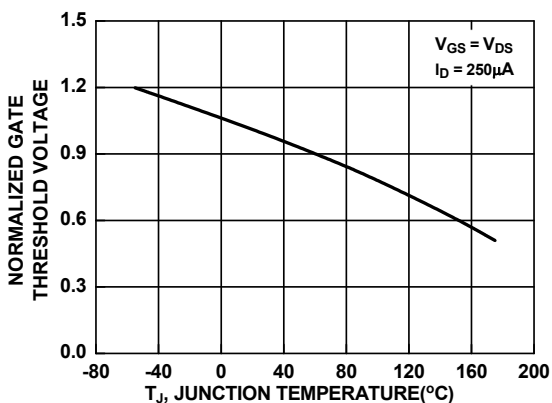


Figure 13. Normalized Gate Threshold Voltage vs Temperature

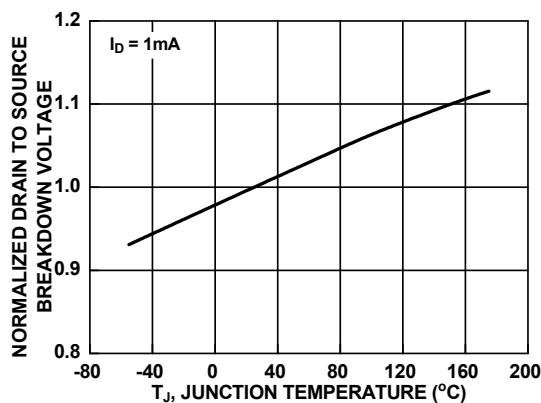


Figure 14. Normalized Drain to Source Breakdown Voltage vs Junction Temperature

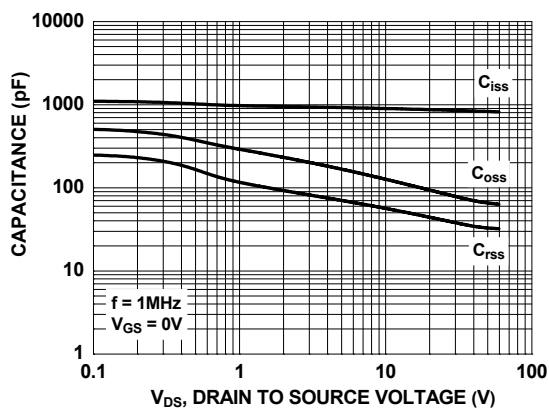


Figure 15. Capacitance vs Drain to Source Voltage

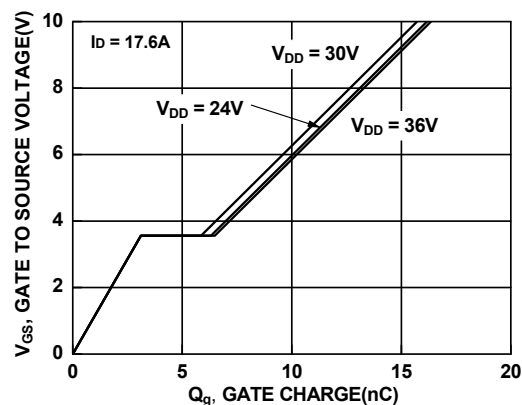



Figure 16. Gate Charge vs Gate to Source Voltage

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