

**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	$I_D = 250\mu\text{A}$ , $V_{GS} = 0\text{V}$	40	-	-	V
$I_{DSS}$	Drain to Source Leakage Current	$V_{DS} = 40\text{V}$ , $T_J = 25^\circ\text{C}$ $V_{GS} = 0\text{V}$ , $T_J = 175^\circ\text{C}(\text{Note } 4)$	-	-	1	$\mu\text{A}$ mA
$I_{GSS}$	Gate to Source Leakage Current	$V_{GS} = \pm 20\text{V}$	-	-	$\pm 100$	nA

**On Characteristics**

$V_{GS(th)}$	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}$ , $I_D = 250\mu\text{A}$	2.0	3.13	4.0	V
$r_{DS(on)}$	Drain to Source On Resistance	$I_D = 80\text{A}$ , $T_J = 25^\circ\text{C}$ $V_{GS} = 10\text{V}$ , $T_J = 175^\circ\text{C}(\text{Note } 4)$	-	1.0 1.63	1.2 1.96	$\text{m}\Omega$ $\text{m}\Omega$

**Dynamic Characteristics**

$C_{iss}$	Input Capacitance	$V_{DS} = 25\text{V}$ , $V_{GS} = 0\text{V}$ , $f = 1\text{MHz}$	-	12700	-	pF
$C_{oss}$	Output Capacitance		-	3195	-	pF
$C_{rss}$	Reverse Transfer Capacitance		-	493	-	pF
$R_g$	Gate Resistance	$f = 1\text{MHz}$	-	2.9	-	$\Omega$
$Q_{g(ToT)}$	Total Gate Charge at 10V	$V_{GS} = 0$ to 10V	$V_{DD} = 20\text{V}$ $I_D = 80\text{A}$	164	213	nC
$Q_{g(th)}$	Threshold Gate Charge	$V_{GS} = 0$ to 2V		23	30	nC
$Q_{gs}$	Gate to Source Gate Charge			59	-	nC
$Q_{gd}$	Gate to Drain "Miller" Charge			25	-	nC

**Switching Characteristics**

$t_{on}$	Turn-On Time	$V_{DD} = 20\text{V}$ , $I_D = 80\text{A}$ , $V_{GS} = 10\text{V}$ , $R_{GS} = 1.5\Omega$	-	-	56	ns
$t_{d(on)}$	Turn-On Delay Time		-	16	-	ns
$t_r$	Rise Time		-	19.5	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	61	-	ns
$t_f$	Fall Time		-	46	-	ns
$t_{off}$	Turn-Off Time		-	-	171	ns

**Drain-Source Diode Characteristics**

$V_{SD}$	Source to Drain Diode Voltage	$I_{SD} = 35\text{A}$ , $V_{GS} = 0\text{V}$	-	-	0.85	V
		$I_{SD} = 15\text{A}$ , $V_{GS} = 0\text{V}$	-	-	0.80	V
$T_{rr}$	Reverse Recovery Time	$I_F = 80\text{A}$ , $dI_{SD}/dt = 100\text{A}/\mu\text{s}$	-	96	125	ns
$Q_{rr}$	Reverse Recovery Charge		-	149	194	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

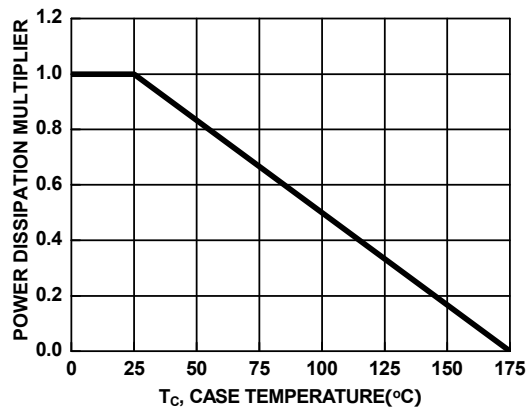
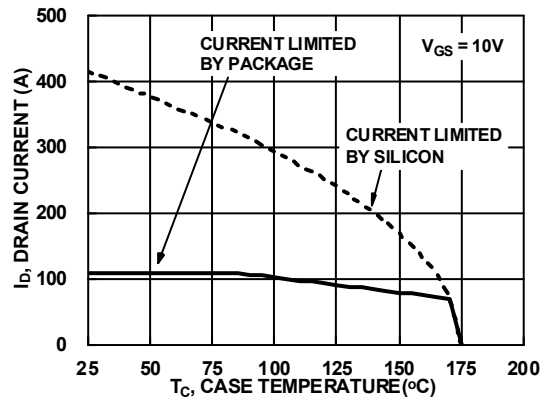


Figure 1. Normalized Power Dissipation vs Case Temperature



NOTE: Refer to ON Semiconductor Application Notes AN9757

Figure 2. Maximum Continuous Drain Current vs Case Temperature

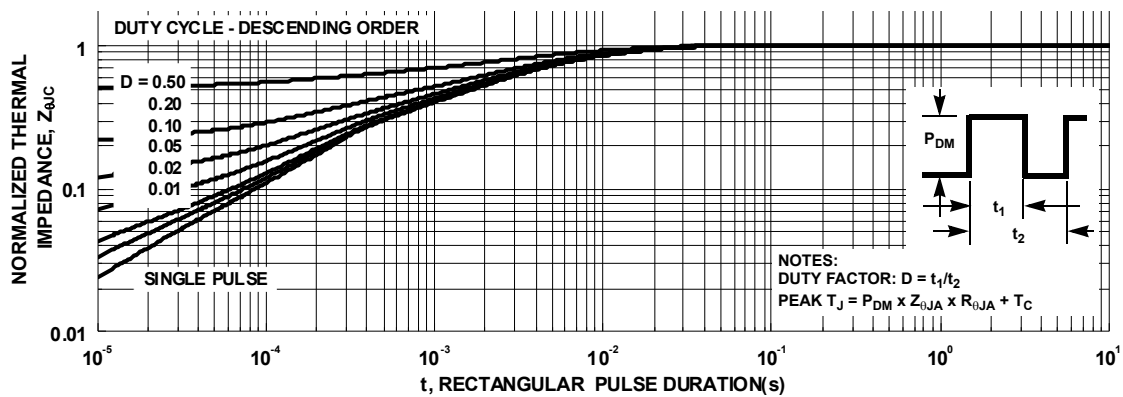


Figure 3. Normalized Maximum Transient Thermal Impedance

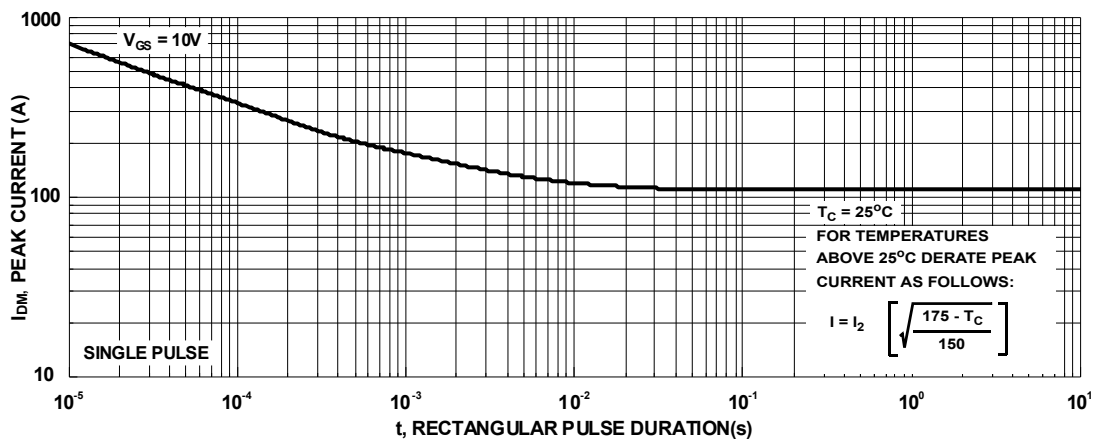


Figure 4. Peak Current Capability

## Typical Characteristics

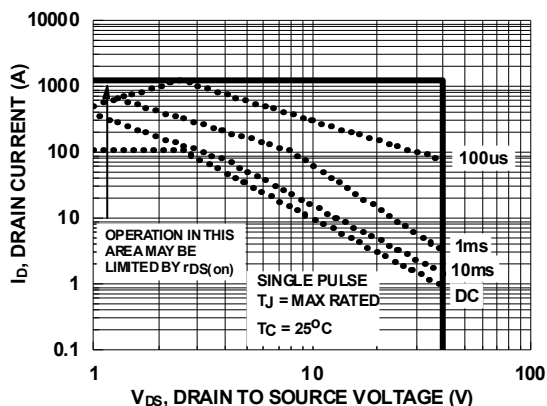
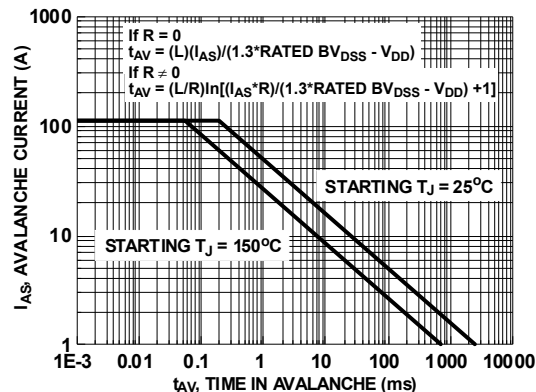


Figure 5. Forward Bias Safe Operating Area



NOTE: Refer to ON Semiconductor Application Notes AN7514 and AN7515

Figure 6. Unclamped Inductive Switching Capability

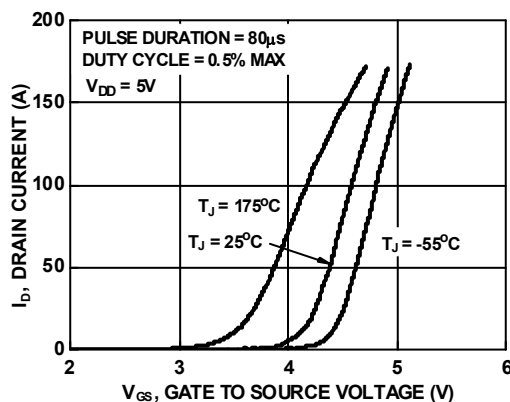


Figure 7. Transfer Characteristics

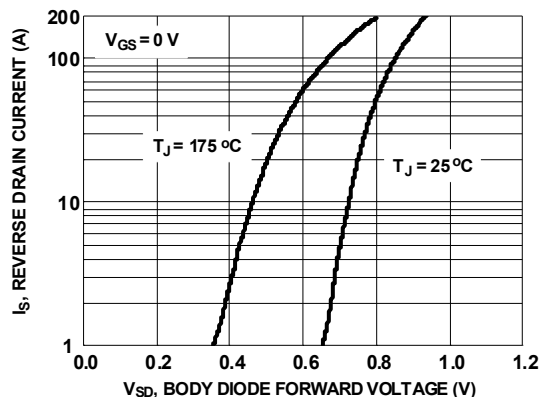


Figure 8. Forward Diode Characteristics

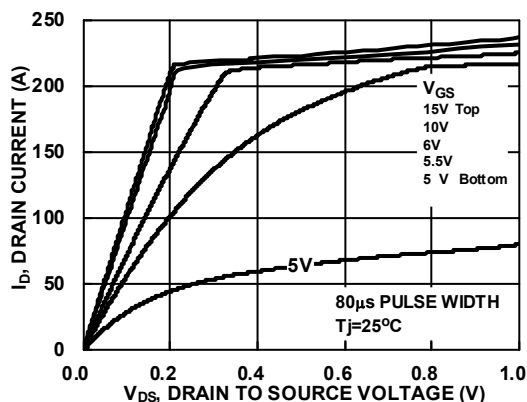


Figure 9. Saturation Characteristics

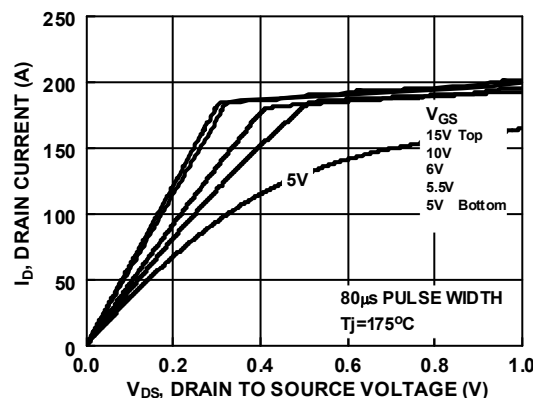


Figure 10. Saturation Characteristics

## Typical Characteristics

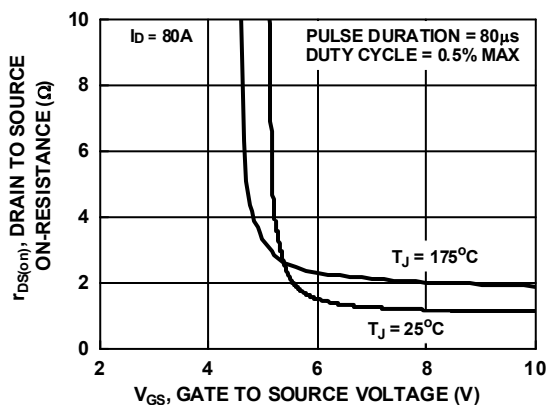


Figure 11. Rdson vs Gate Voltage

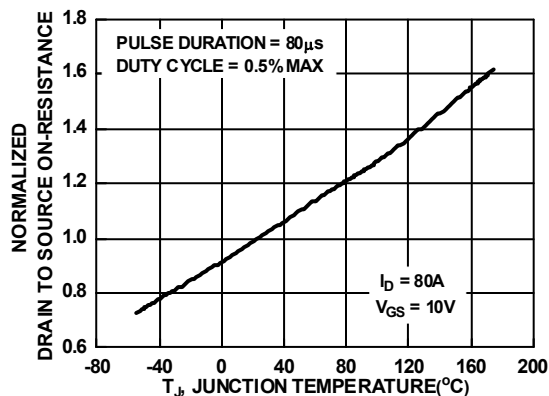


Figure 12. Normalized Rdson vs Junction Temperature

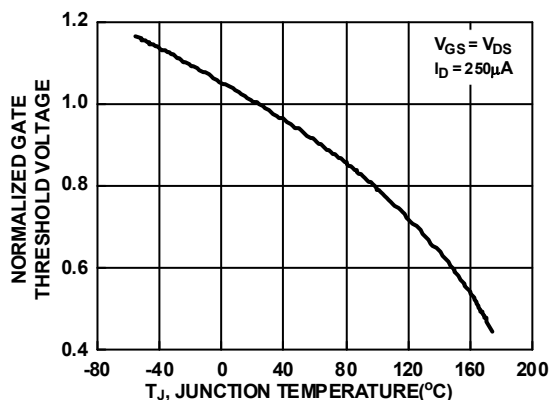


Figure 13. Normalized Gate Threshold Voltage vs Temperature

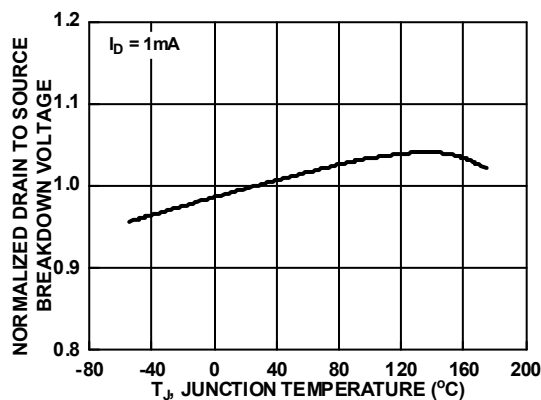


Figure 14. Normalized Drain to Source Breakdown Voltage vs Junction Temperature

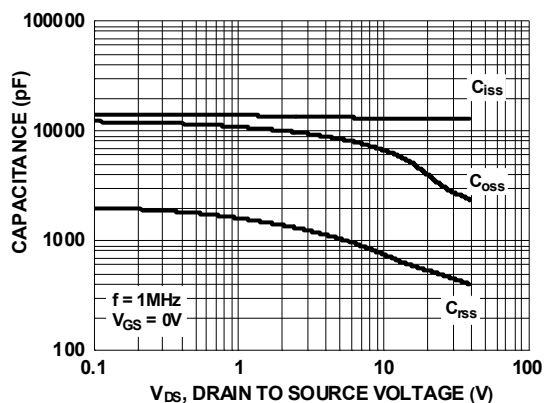


Figure 15. Capacitance vs Drain to Source Voltage

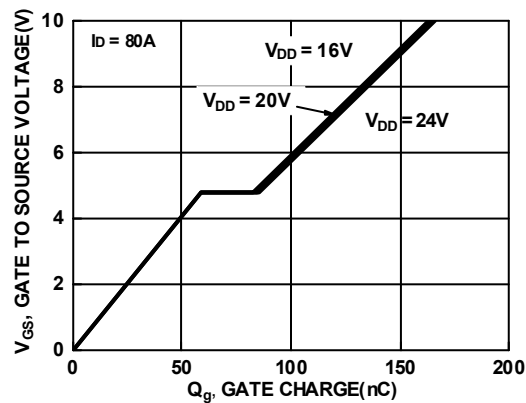


Figure 16. Gate Charge vs Gate to Source Voltage

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