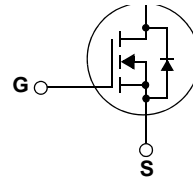


### Features

- $V_{DS}(V) = 40V$
- $I_D = 80A$  ( $V_{GS} = 10V$ )
- $R_{DS(ON)} < 2.2m\Omega$  ( $V_{GS} = 10V$ )
- $R_{DS(ON)} < 2.4m\Omega$  ( $V_{GS} = 4.5V$ )
- Low Miller Charge
- Low  $Q_{rr}$  Body Diode

### Applications

- Power Tools
- Motor Drives and Uninterruptible Power Supplies
- Synchronous Rectification
- Battery Protection Circuit



### MOSFET Maximum Ratings $T_C = 25^\circ C$ unless otherwise noted

Symbol	Parameter		FDP8440	Unit
$V_{DSS}$	Drain to Source Voltage		40	V
$V_{GSS}$	Gate to Source Voltage		$\pm 20$	V
$I_D$	Drain Current	- Continuous ( $T_C = 25^\circ C$ , Silicon Limited) - Continuous ( $T_C = 100^\circ C$ , Silicon Limited) - Continuous ( $T_C = 25^\circ C$ , Package Limited)	277* 196* 100	A
$I_{DM}$	Drain Current	- Pulsed (Note 1)	500	A
$E_{AS}$	Single Pulsed Avalanche Energy (Note 2)		1682	mJ
$P_D$	Power Dissipation	( $T_C = 25^\circ C$ )	306	W
		- Derate above $25^\circ C$	2.04	W/ $^\circ C$
$T_J, T_{STG}$	Operating and Storage Temperature Range		-55 to +175	$^\circ C$
$T_L$	Maximum Lead Temperature for Soldering Purpose, 1/8" from Case for 5 Seconds		300	$^\circ C$

### Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance, Junction to Case, Max.	0.49	$^\circ C/W$
$R_{\theta CS}$	Thermal Resistance, Case to Sink (Typ.)	0.5	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient, Max.	62.5	$^\circ C/W$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
$BV_{DSS}$	Drain to Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	40			V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 32V$			1	$\mu A$
		$V_{GS} = 0V$			250	$\mu A$
$I_{GSS}$	Gate to Body Leakage Current	$V_{GS} = \pm 20V$			$\pm 100$	nA
$V_{GS(th)}$	Gate to Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1		3	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 4.5V, I_D = 80A$		1.88	2.4	m $\Omega$
		$V_{GS} = 10V, I_D = 80A$		1.64	2.2	
		$V_{GS} = 10V, I_D = 80A,$ $T_C = 175^\circ C$		3.00	4.4	
$C_{iss}$	Input Capacitance			18600	24740	pF
$C_{oss}$	Output Capacitance	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1.0MHz$		1840	2450	pF
$C_{rss}$	Reverse Transfer Capacitance			1400	2100	pF
$R_G$	Gate Resistance	$V_{GS} = 0.5V, f = 1MHz$		1.1		$\Omega$
$Q_{g(tot)}$	Total Gate Charge at 10V	$V_{GS} = 0V$ to 10V		345	450	nC
$Q_{g(2)}$	Threshold Gate Charge	$V_{GS} = 0V$ to 2V		32.5		nC
$Q_{gs}$	Gate to Source Gate Charge			49		nC
$Q_{gs2}$	Gate Charge Threshold to Plateau			16.5		nC
$Q_{gd}$	Gate to Drain "Miller" Charge			74		nC
$t_{ON}$	Turn-On Time			175	360	ns
$t_{d(on)}$	Turn-On Delay Time			43	95	ns
$t_r$	Rise Time			130	275	ns
$t_{d(off)}$	Turn-Off Delay Time			435	875	ns
$t_f$	Fall Time			290	590	ns
$t_{OFF}$	Turn-Off Time			730	1470	ns
$V_{SD}$	Source to Drain Diode Voltage	$I_{SD} = 80A$			1.25	V
		$I_{SD} = 40A$			1.0	V
$t_{rr}$	Reverse Recovery Time	$I_{SD} = 75A, di_{SD}/dt = 100A/\mu s$		59		ns
$Q_{RR}$	Reverse Recovery Charge	$I_{SD} = 75A, di_{SD}/dt = 100A/\mu s$		77		nC

**NOTES:**

1: Pulse width limited by maximum junction temperature.

 2: Starting  $T_J = 25^\circ C, L = 1mH, I_{AS} = 58A, V_{DD} = 36V, V_{GS} = 10V.$

Typical Performance Characteristics

Figure 1. On-Region Characteristics

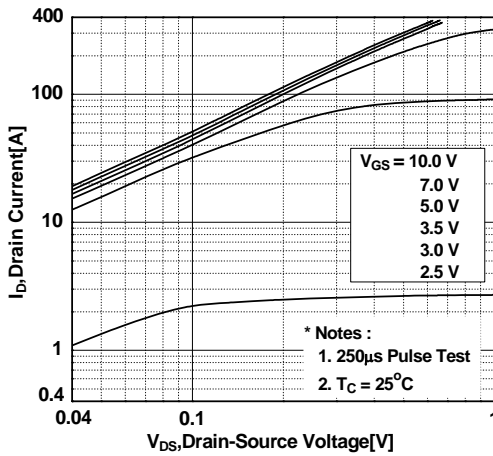


Figure 2. Transfer Characteristics

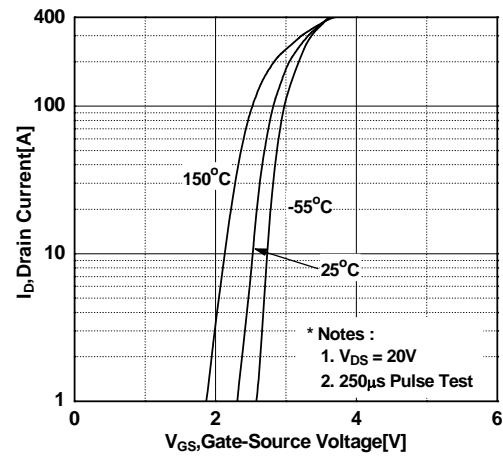


Figure 3. On-Resistance Variation vs. Drain Current and Gate Voltage

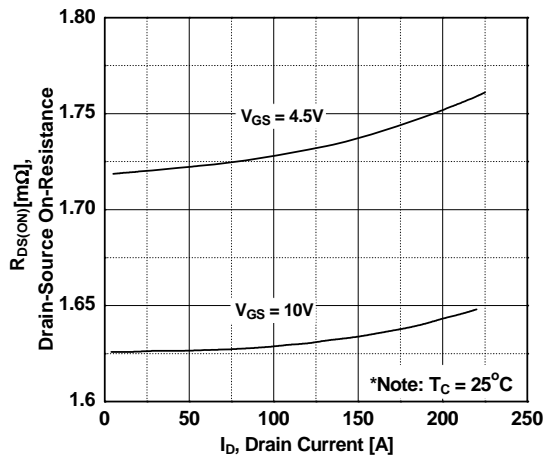


Figure 4. Body Diode Forward Voltage Variation vs. Source Current and Temperature

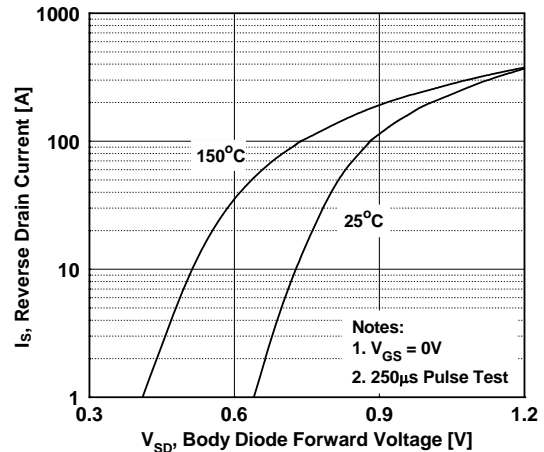


Figure 5. Capacitance Characteristics

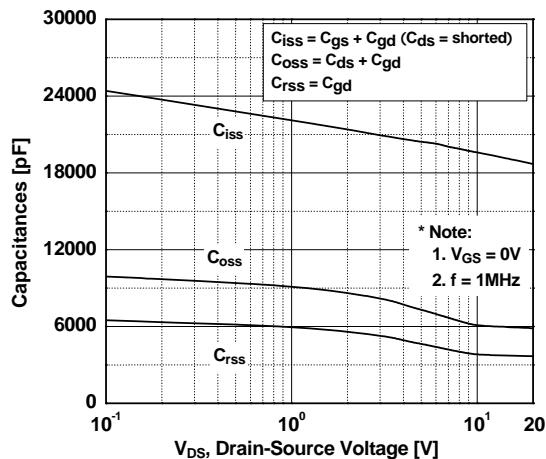
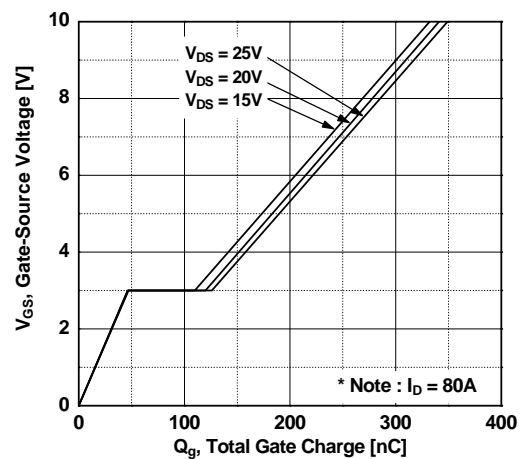


Figure 6. Gate Charge Characteristics



Typical Performance Characteristics (Continued)

Figure 7. Breakdown Voltage Variation vs. Temperature

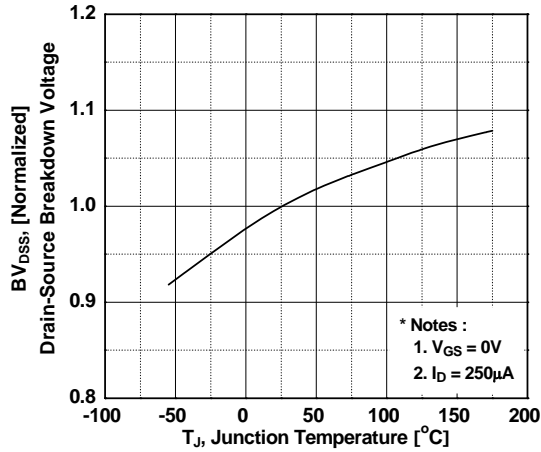


Figure 8. On-Resistance Variation vs. Temperature

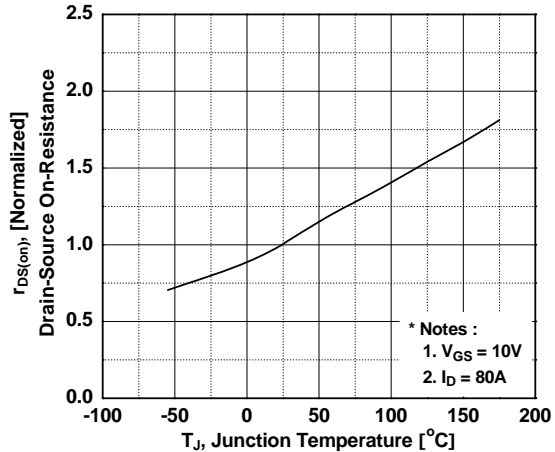


Figure 9. Unclamped Inductive Switching Capability

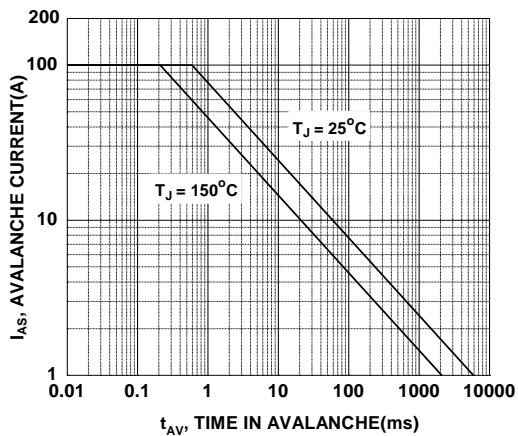


Figure 10. Safe Operating Area

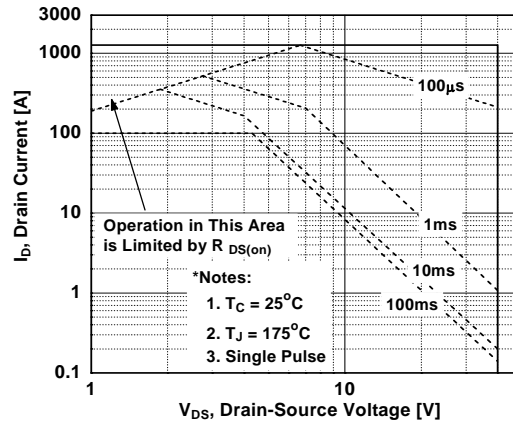
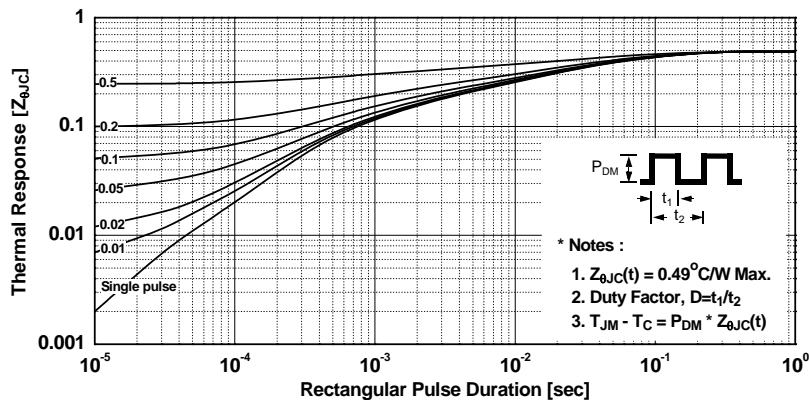
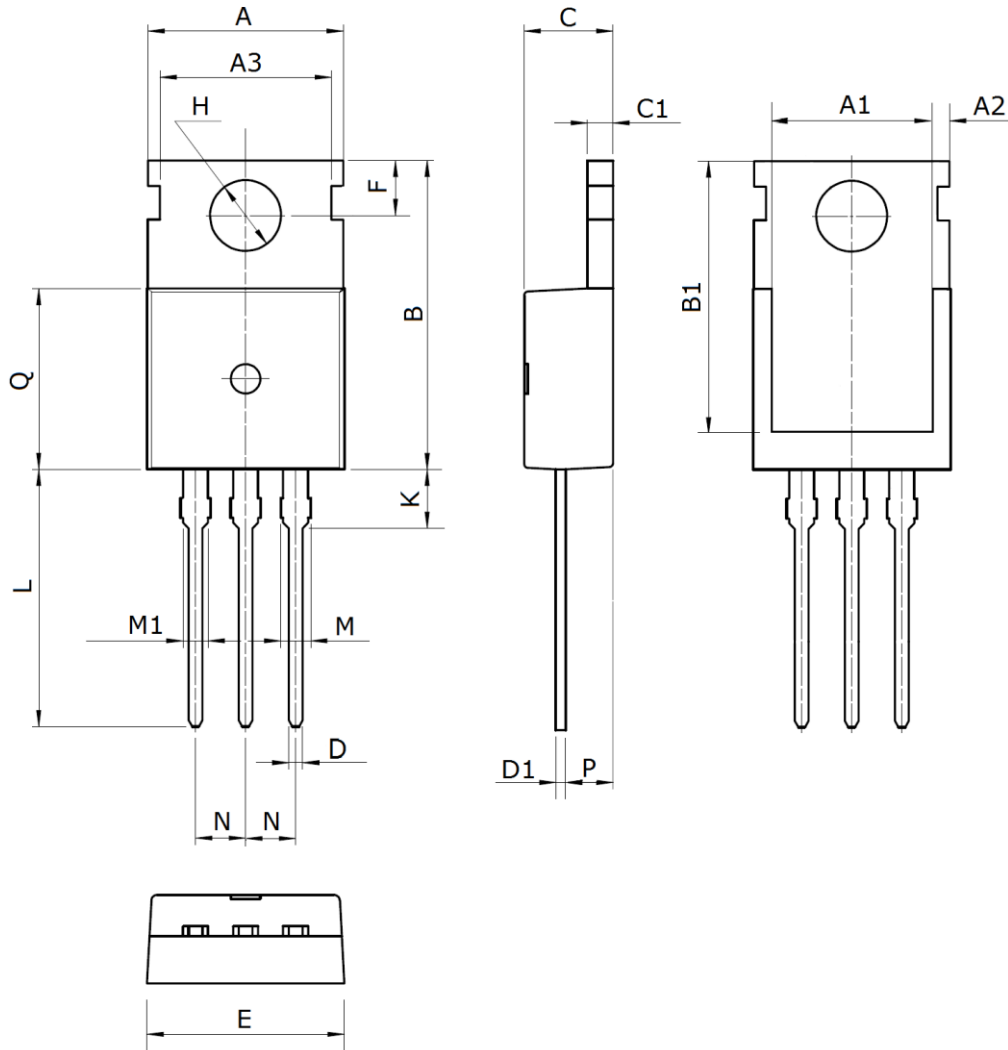


Figure 11. Transient Thermal Response Curve



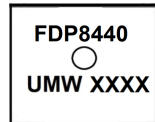
Package Demensions

TO 220



Symbol	Dimensions (mm)	Symbol	Dimensions (mm)	Symbol	Dimensions (mm)
A	10.0±0.3	C1	1.3±0.2	L	13.2±0.4
A1	8.0±0.2	D	0.8±0.2	M	1.38±0.1
A2	0.94±0.1	D1	0.5±0.1	M1	1.28±0.1
A3	8.7±0.1	E	10.0±0.3	N	2.54(typ)
B	15.6±0.4	F	<b>2.8±0.1</b>	P	2.4±0.3
B1	<b>13.2±0.2</b>	H	3.6±0.1	Q	<b>9.15±0.25</b>
C	<b>4.5±0.2</b>	K	3.1±0.2		

**Marking**



**Ordering information**

Order code	Package	Baseqty	Deliverymode
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