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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
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Off Characteristics

BV_{DSS}	Drain to Source Breakdown Voltage	$I_D = 250\text{ }\mu\text{A}$, $V_{GS} = 0\text{ V}$	30			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	$I_D = 250\text{ }\mu\text{A}$, referenced to $25\text{ }^\circ\text{C}$		15		mV/ $^\circ\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 24\text{ V}$, $V_{GS} = 0\text{ V}$			1	μA
I_{GSS}	Gate to Source Leakage Current	$V_{GS} = \pm 20\text{ V}$, $V_{DS} = 0\text{ V}$			± 100	nA

On Characteristics

$V_{GS(th)}$	Gate to Source Threshold Voltage	$V_{GS} = V_{DS}$, $I_D = 250\text{ }\mu\text{A}$	1.0	1.6	3.0	V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate to Source Threshold Voltage Temperature Coefficient	$I_D = 250\text{ }\mu\text{A}$, referenced to $25\text{ }^\circ\text{C}$		-6		mV/ $^\circ\text{C}$
$r_{DS(on)}$	Static Drain to Source On Resistance	$V_{GS} = 10\text{ V}$, $I_D = 38\text{ A}$		0.6	1.0	m Ω
		$V_{GS} = 4.5\text{ V}$, $I_D = 33\text{ A}$		0.8	1.3	
		$V_{GS} = 10\text{ V}$, $I_D = 38\text{ A}$, $T_J = 125\text{ }^\circ\text{C}$		0.9	1.5	
g_{FS}	Forward Transconductance	$V_{DD} = 5\text{ V}$, $I_D = 38\text{ A}$		281		S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 15\text{ V}$, $V_{GS} = 0\text{ V}$ $f = 1\text{ MHz}$		7090	9930	pF
C_{oss}	Output Capacitance			2025	2835	pF
C_{rss}	Reverse Transfer Capacitance			212	300	pF
R_g	Gate Resistance		0.1	1.9	3.8	Ω

Switching Characteristics

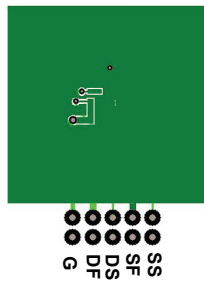
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 15\text{ V}$, $I_D = 38\text{ A}$ $V_{GS} = 10\text{ V}$, $R_{GEN} = 6\text{ }\Omega$		14	26	ns	
t_r	Rise Time			15	27	ns	
$t_{d(off)}$	Turn-Off Delay Time			66	105	ns	
t_f	Fall Time			24	39	ns	
$Q_{g(TOT)}$	Total Gate Charge		$V_{GS} = 0\text{ V to } 10\text{ V}$		97	142	nC
$Q_{g(TOT)}$	Total Gate Charge		$V_{GS} = 0\text{ V to } 4.5\text{ V}$	$V_{DD} = 15\text{ V}$ $I_D = 38\text{ A}$	46	74	nC
Q_{gs}	Gate to Source Charge			17		nC	
Q_{gd}	Gate to Drain "Miller" Charge			12		nC	

Drain-Source Diode Characteristics

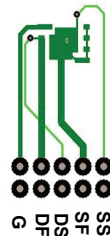
V_{SD}	Source to Drain Diode Forward Voltage	$V_{GS} = 0\text{ V}$, $I_S = 38\text{ A}$ (Note 2)		0.8	1.3	V
V_{SD}	Source to Drain Diode Forward Voltage	$V_{GS} = 0\text{ V}$, $I_S = 2\text{ A}$ (Note 2)		0.7	1.2	V
t_{rr}	Reverse Recovery Time	$I_F = 38\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$		64	103	ns
Q_{rr}	Reverse Recovery Charge			56	90	nC

NOTES:

- $R_{\theta JA}$ is determined with the device mounted on a 1 in^2 pad 2 oz copper pad on a $1.5 \times 1.5\text{ in.}$ board of FR-4 material. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design.



a. $55\text{ }^\circ\text{C/W}$ when mounted on a 1 in^2 pad of 2 oz copper



b. $125\text{ }^\circ\text{C/W}$ when mounted on a minimum pad of 2 oz copper

- Pulse Test: Pulse Width < $300\text{ }\mu\text{s}$, Duty cycle < 2.0% .
- E_{AS} of 726 mJ is based on starting $T_J = 25\text{ }^\circ\text{C}$, $L = 3\text{ mH}$, $I_{AS} = 22\text{ A}$, $V_{DD} = 30\text{ V}$, $V_{GS} = 10\text{ V}$. 100% tested at $L = 0.1\text{ mH}$, $I_{AS} = 70\text{ A}$.
- Pulsed I_D please refer to Fig 11 SOA graph for more details.
- Computed continuous current limited to Max Junction Temperature only, actual continuous current will be limited by thermal & electro-mechanical application board design.

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

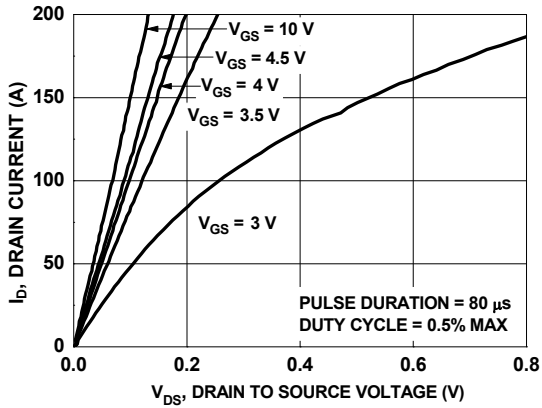


Figure 1. On-Region Characteristics

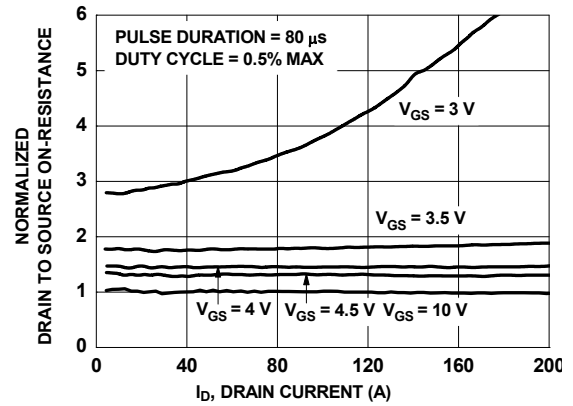


Figure 2. Normalized On-Resistance vs. Drain Current and Gate Voltage

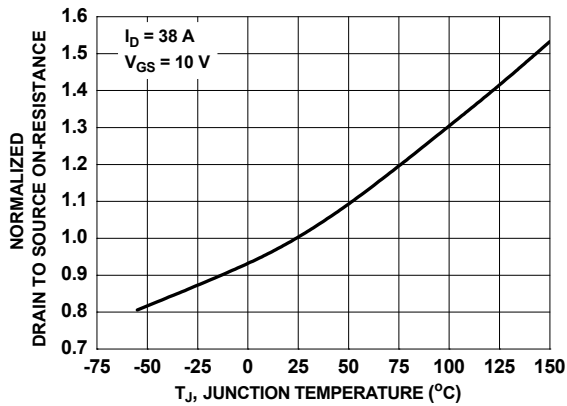


Figure 3. Normalized On Resistance vs. Junction Temperature

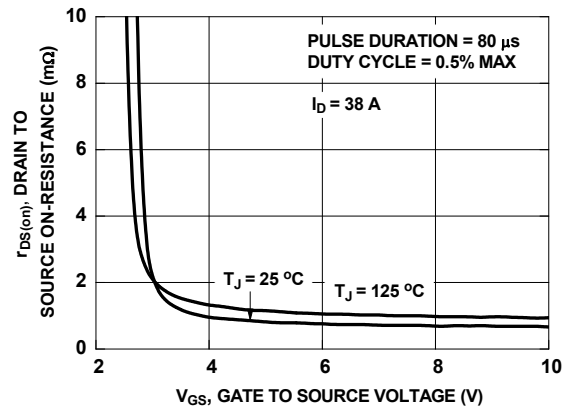


Figure 4. On Resistance vs. Gate to Source Voltage

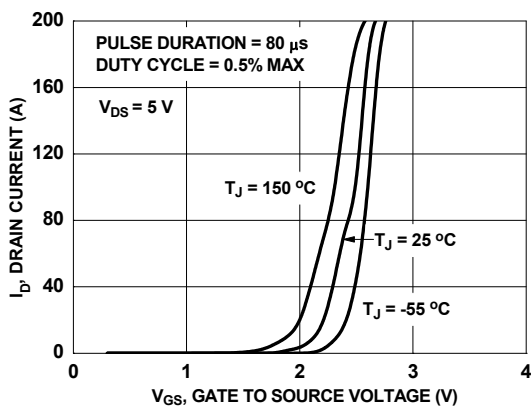


Figure 5. Transfer Characteristics

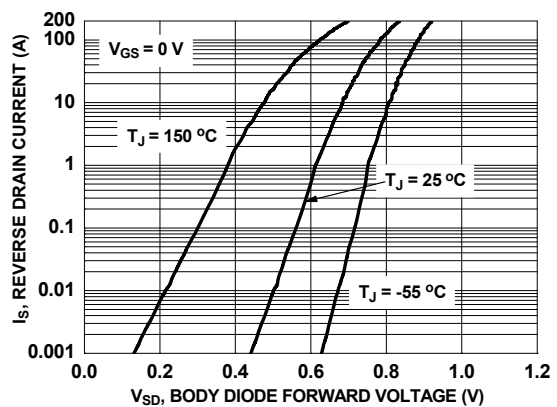


Figure 6. Source to Drain Diode Forward Voltage vs. Source Current

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

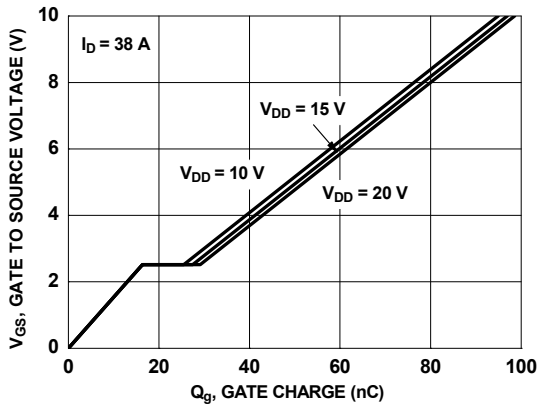


Figure 7. Gate Charge Characteristics

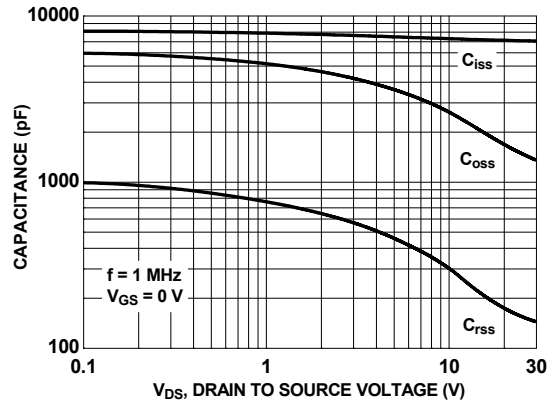


Figure 8. Capacitance vs. Drain to Source Voltage

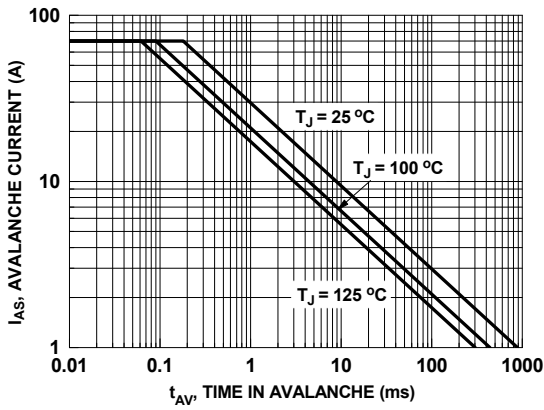


Figure 9. Unclamped Inductive Switching Capability

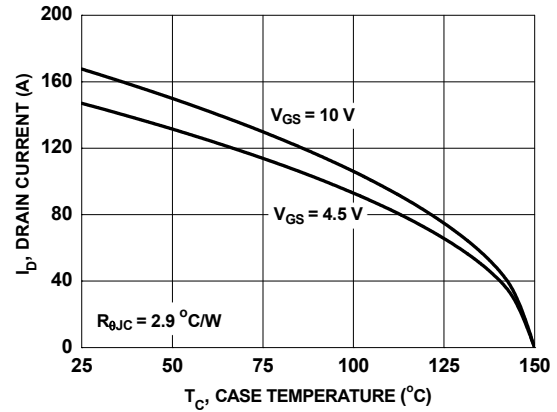


Figure 10. Maximum Continuous Drain Current vs. Case Temperature

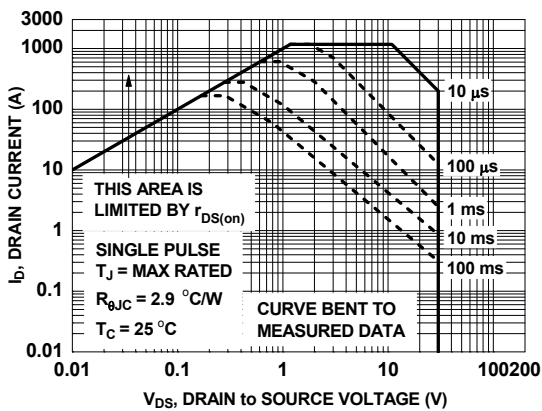


Figure 11. Forward Bias Safe Operating Area

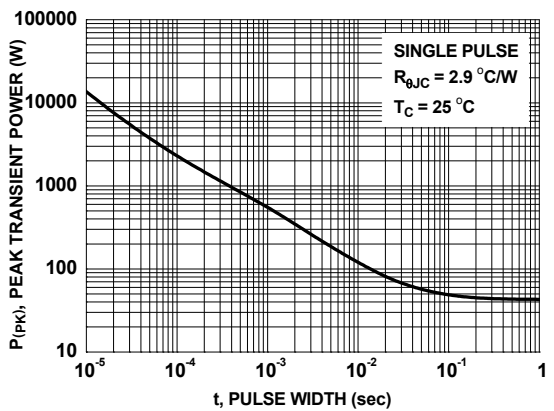


Figure 12. Single Pulse Maximum Power Dissipation

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

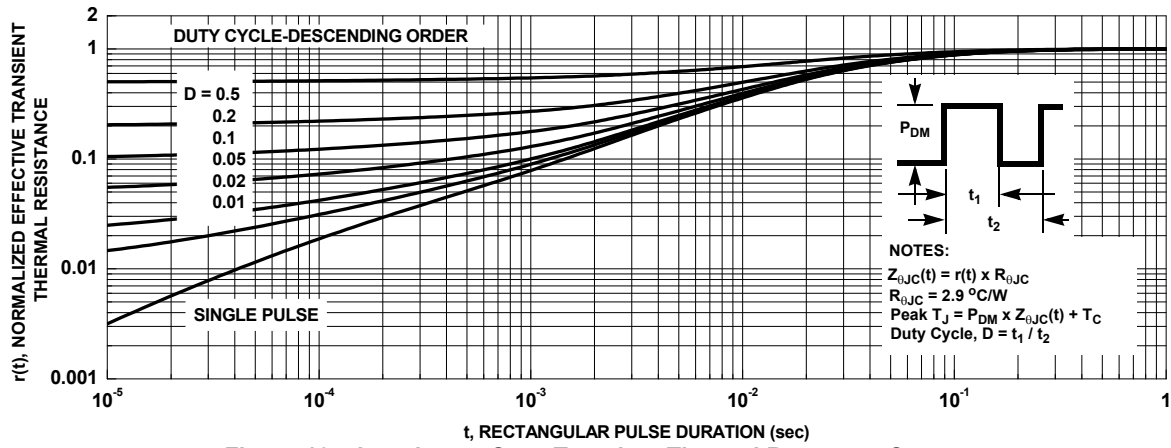
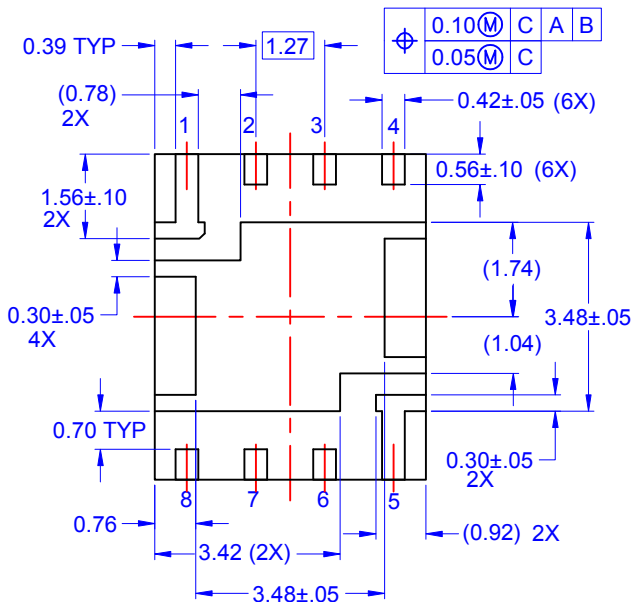
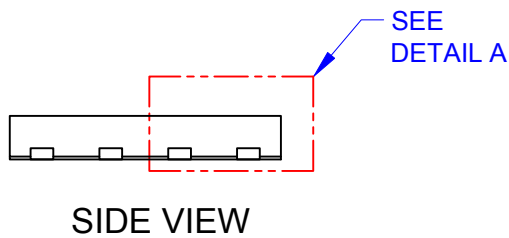
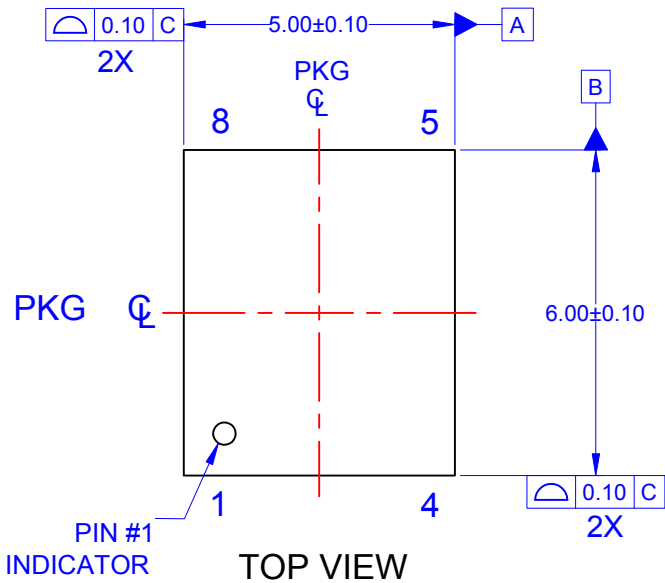
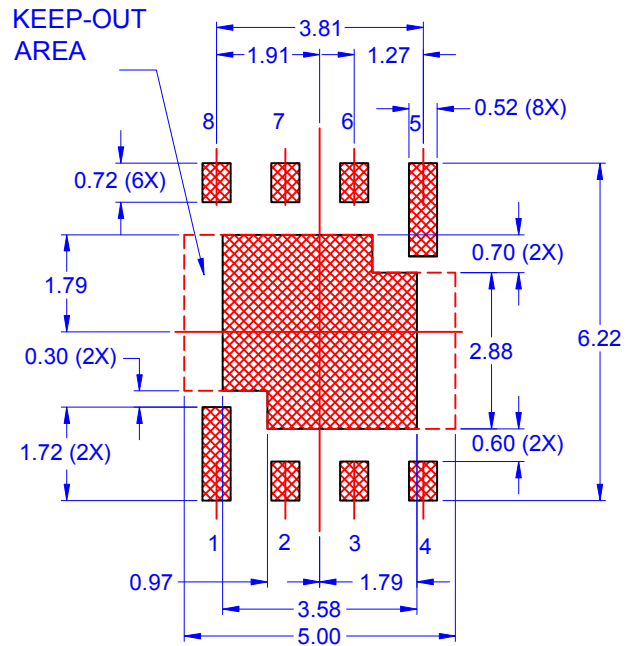


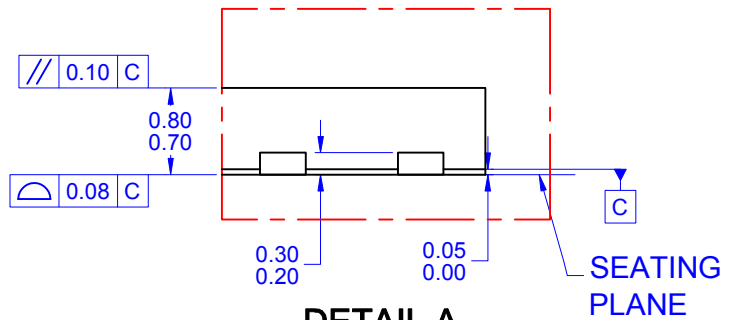
Figure 13. Junction-to-Case Transient Thermal Response Curve



BOTTOM VIEW



RECOMMENDED LAND PATTERN



DETAIL A
(SCALE: 2X)

NOTES:

- A) PACKAGE REFERENCE : TO JEDEC REGISTRATION, MO-240B, VARIATION AA.
- B) ALL DIMENSIONS ARE IN MILLIMETERS.
- C) DIMENSIONS DO NOT INCLUDE BURRS OR MOLD FLASH. MOLD FLASH OR BURRS DOES NOT EXCEED 0.10MM.
- D) DIMENSIONING AND TOLERANCING PER ASME Y14.5M-2009
- E) IT IS RECOMMENDED TO HAVE NO TRACES OR VIAS WITHIN THE KEEP-OUT AREA
- F) DRAWING FILE NAME: PQFN08OREV1



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