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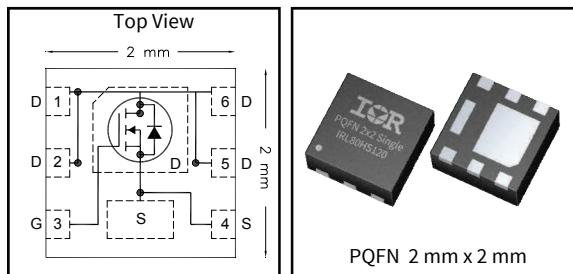
Target Applications

- Wireless charging
- Adapter
- Telecom

Benefits

- Higher power density designs
- Higher switching frequency
- IR MOSFET — Uses OptiMOS™5 Chip
- Reduced parts count wherever 5V supplies are available
- Driven directly from microcontrollers (slow switching)
- System cost reductions

Typical values (unless otherwise specified)		
V_{DSS}	V_{GS}	$R_{DS(on)}$ (max.)
80V min.	$\pm 20V$ max	32mΩ @ 10V
$Q_{g\text{tot}}$	Q_{gd}	$V_{gs(\text{th})}$
4.7nC	1.8nC	1.7V



G	D	S
Gate	Drain	Source

Base part number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRL80HS120	PQFN 2mm x 2mm	Tape and Reel	4000	IRL80HS120

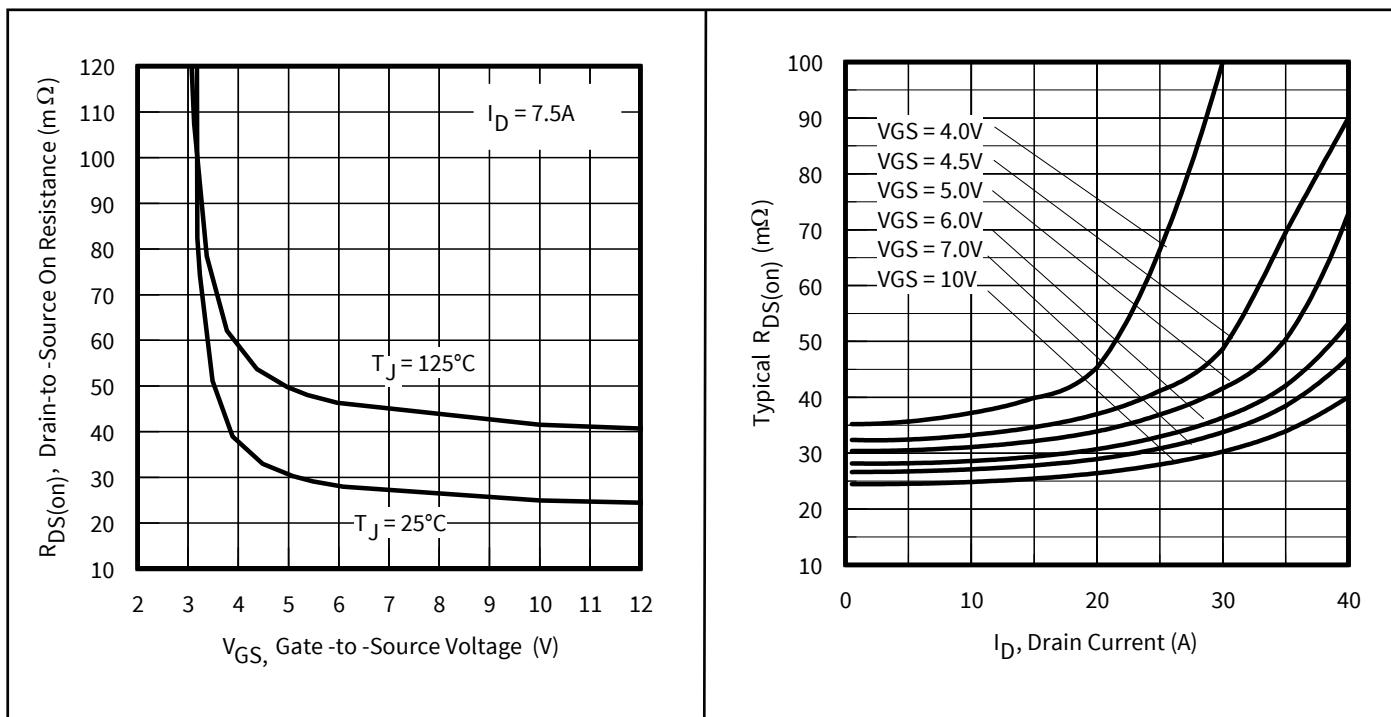


Figure 1 Typical On-Resistance vs. Gate Voltage

Figure 2 Typical On-Resistance vs. Drain Current

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1 Parameters

Table1 Key performance parameters

Parameter	Values	Units
V _{DS}	80	V
R _{DS(on) max}	32	mΩ
I _D @ T _C = 25°C	12.5	A
I _D @ T _A = 25°C	6.0	A

2 Maximum ratings and thermal characteristics

Table 2 Maximum ratings (at $T_J = 25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Conditions	Values	Unit
Continuous Drain Current (Silicon Limited) ⑥ ⑦	I_D	$T_C(\text{Bottom}) = 25^\circ\text{C}, V_{GS} @ 10V$	12.5	A
Continuous Drain Current (Silicon Limited) ⑥	I_D	$T_C(\text{Bottom}) = 100^\circ\text{C}, V_{GS} @ 10V$	9.0	
Continuous Drain Current (Silicon Limited) ⑦ (Source Bonding Technologies Limited)	I_D	$T_C(\text{Bottom}) = 25^\circ\text{C}, V_{GS} @ 10V$	10.2	
Continuous Drain Current (Silicon Limited) ⑤	I_D	$T_A = 25^\circ\text{C}, V_{GS} @ 10V$	6.0	
Pulsed Drain Current ①	I_{DM}	$T_C(\text{Bottom}) = 25^\circ\text{C}$	41	W
Maximum Power Dissipation	P_D	$T_C(\text{Bottom}) = 25^\circ\text{C}$	11.5	
Maximum Power Dissipation	P_D	$T_C(\text{Bottom}) = 100^\circ\text{C}$	5.8	
Maximum Power Dissipation	P_D	$T_A = 25^\circ\text{C}$	2.5	V
Gate-to-Source Voltage	V_{GS}	-	± 20	
Peak Soldering Temperature	T_P	-	270	
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-	-55 to +175	$^\circ\text{C}$

Table 3 Thermal characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Junction-to-Case (Bottom) ④	$R_{\theta JC}$	-	-	-	13	$^\circ\text{C/W}$
Junction-to-Case (Top) ④	$R_{\theta JC}$	-	-	-	90	
Junction-to-Ambient ⑤	$R_{\theta JA}$	-	-	-	60	
Junction-to-Ambient ⑤	$R_{\theta JA} (<10\text{s})$	-	-	-	42	

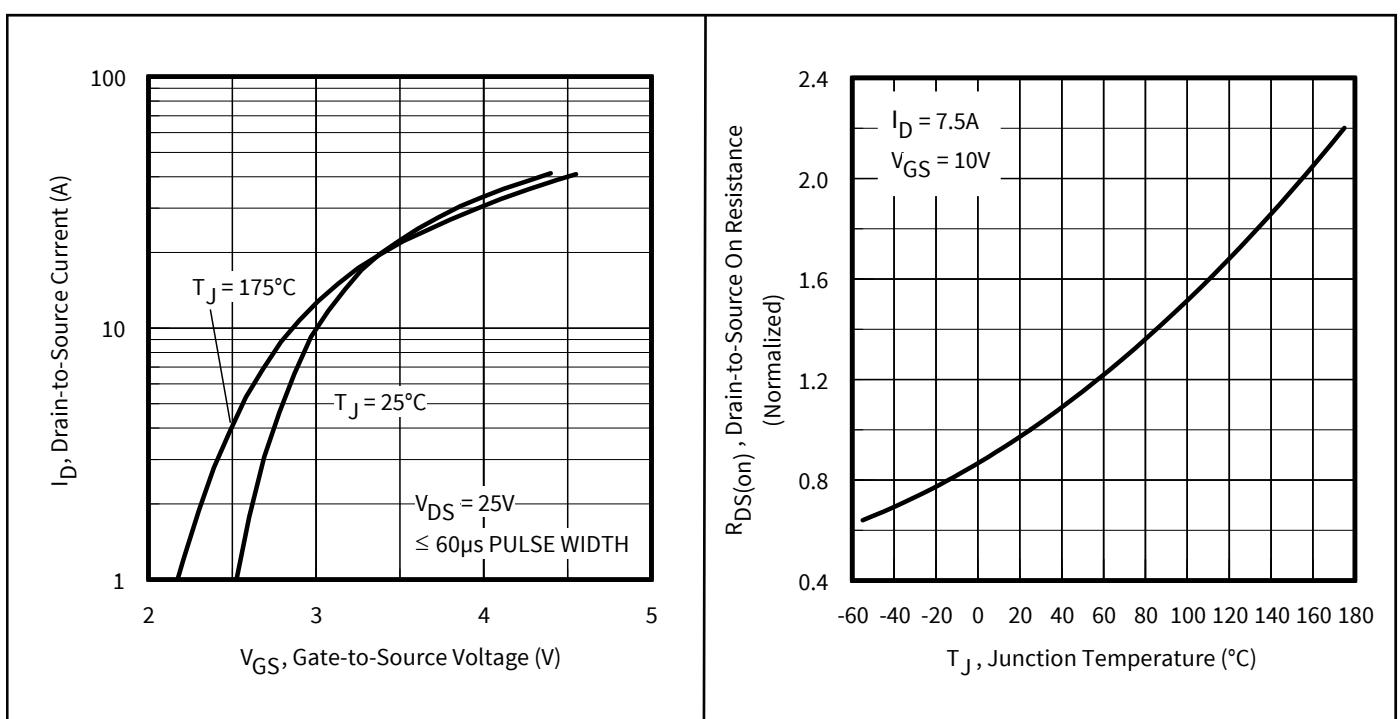
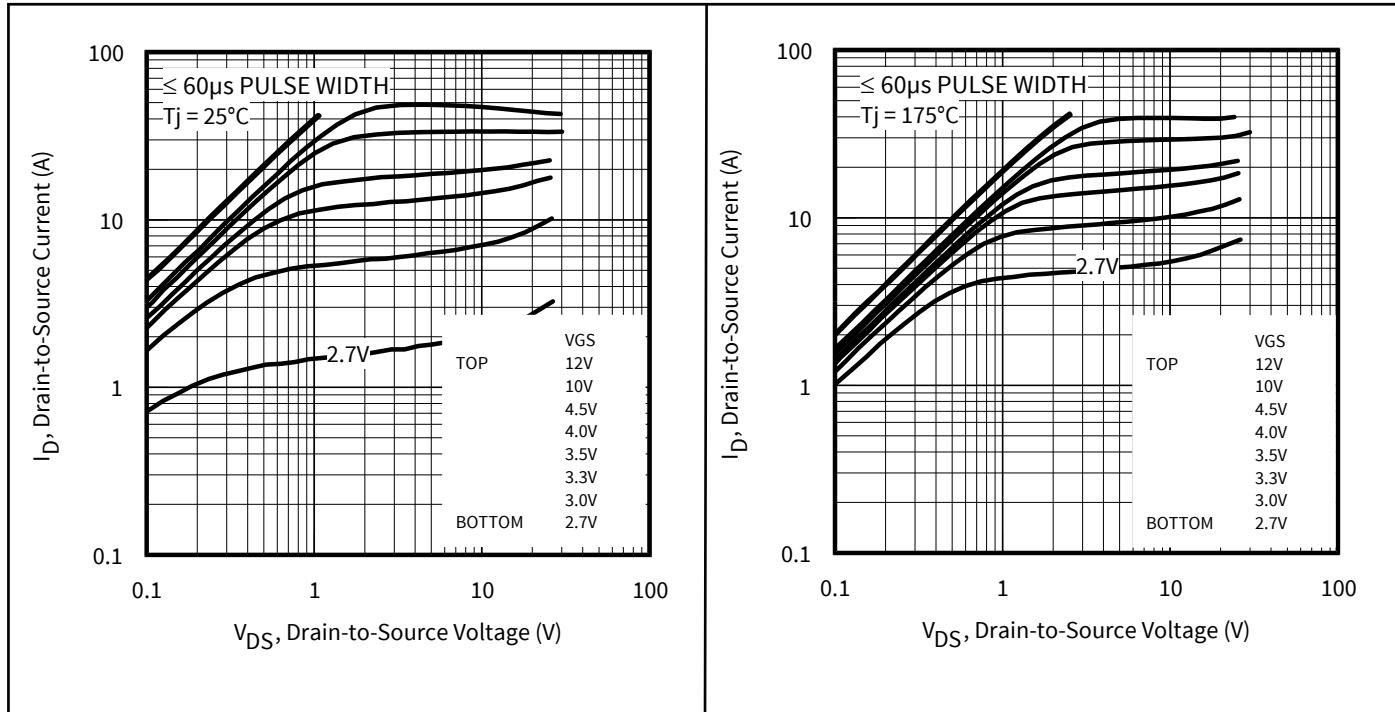
Table 4 Avalanche characteristics

Parameter	Symbol	Values	Unit
Single Pulse Avalanche Energy ②	E_{AS}	22	mJ
Avalanche Current ②	I_{AR}	7.5	A

Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② Starting $T_J = 25^\circ\text{C}$, $L = 0.8\text{mH}$, $R_G = 50\Omega$, $I_{AS} = 7.5\text{A}$.
- ③ Pulse width $\leq 400\mu\text{s}$; duty cycle $\leq 2\%$.
- ④ R_θ is measured at T_J of approximately 90°C .
- ⑤ When mounted on a 1 inch square PCB (FR-4). Please refer to AN-994 for more details.
- ⑥ Calculated continuous current based on maximum allowable junction temperature.
- ⑦ Current is limited to 10.2A by source bonding technology.

4 Electrical characteristic diagrams



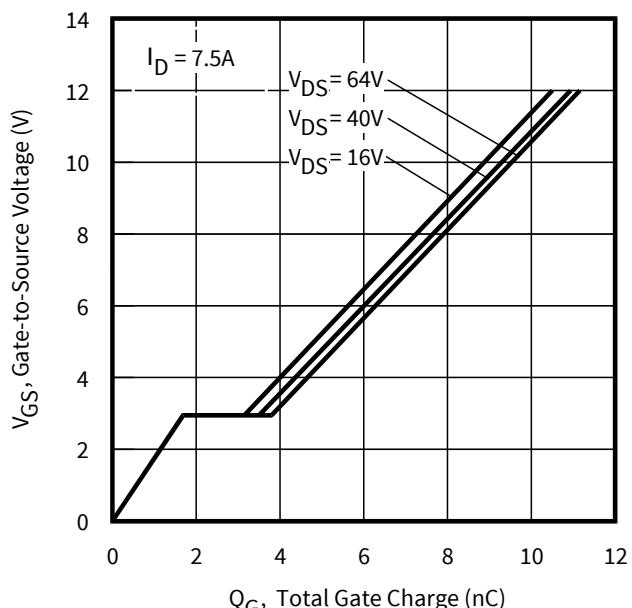
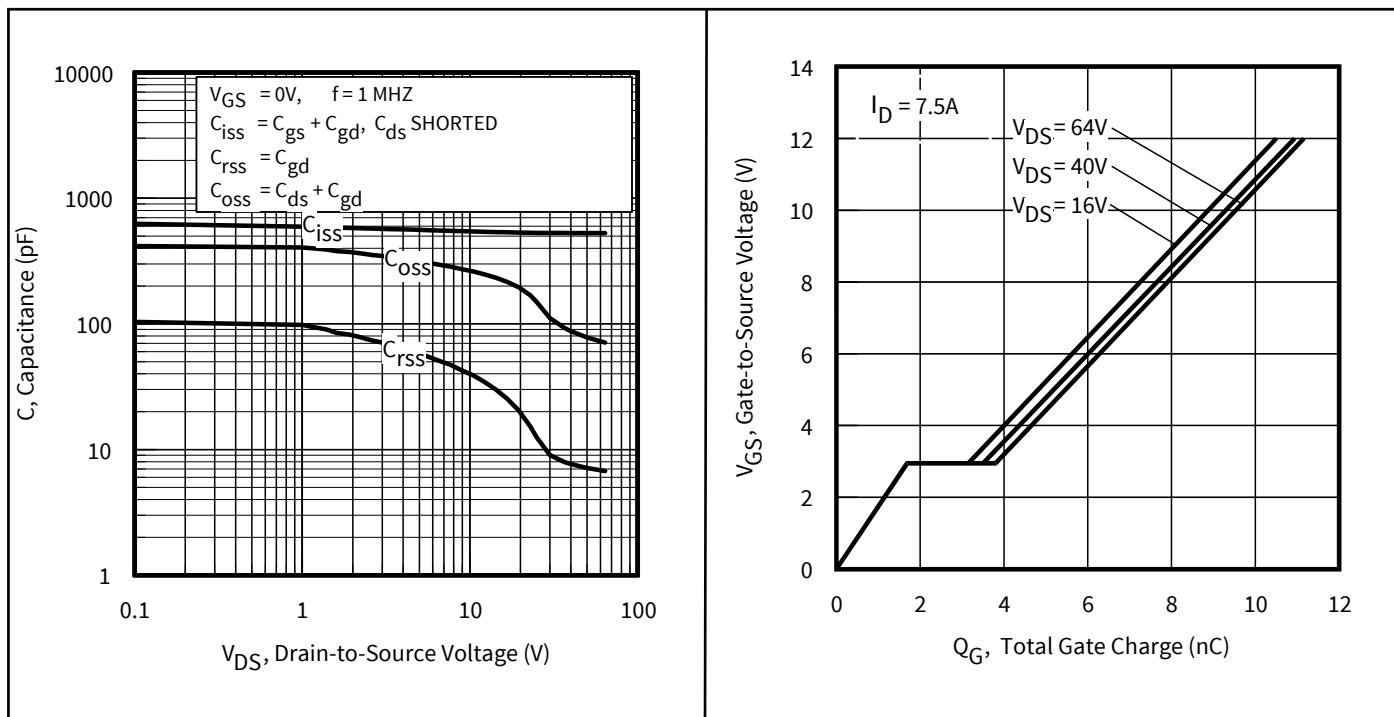
IRL80HS120
Electrical characteristic diagrams


Figure 7 Typical Capacitance vs. Drain-to-Source Voltage

Figure 8 Typical Gate Charge vs. Gate-to-Source Voltage

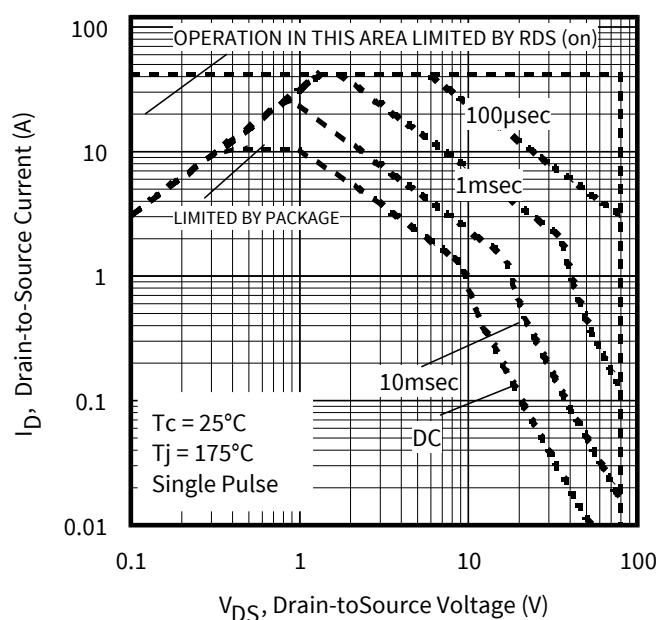
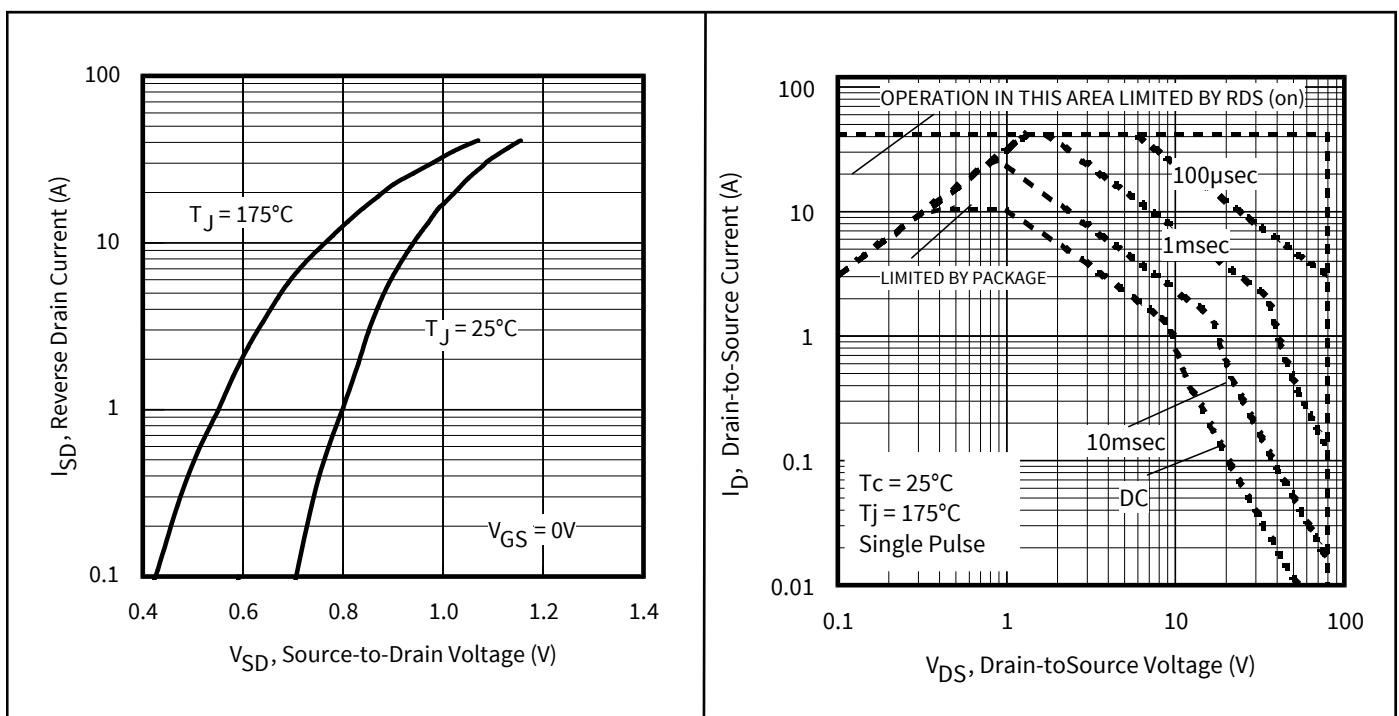


Figure 9 Typical Source-Drain Diode Forward Voltage

Figure 10 Maximum Safe Operating Area

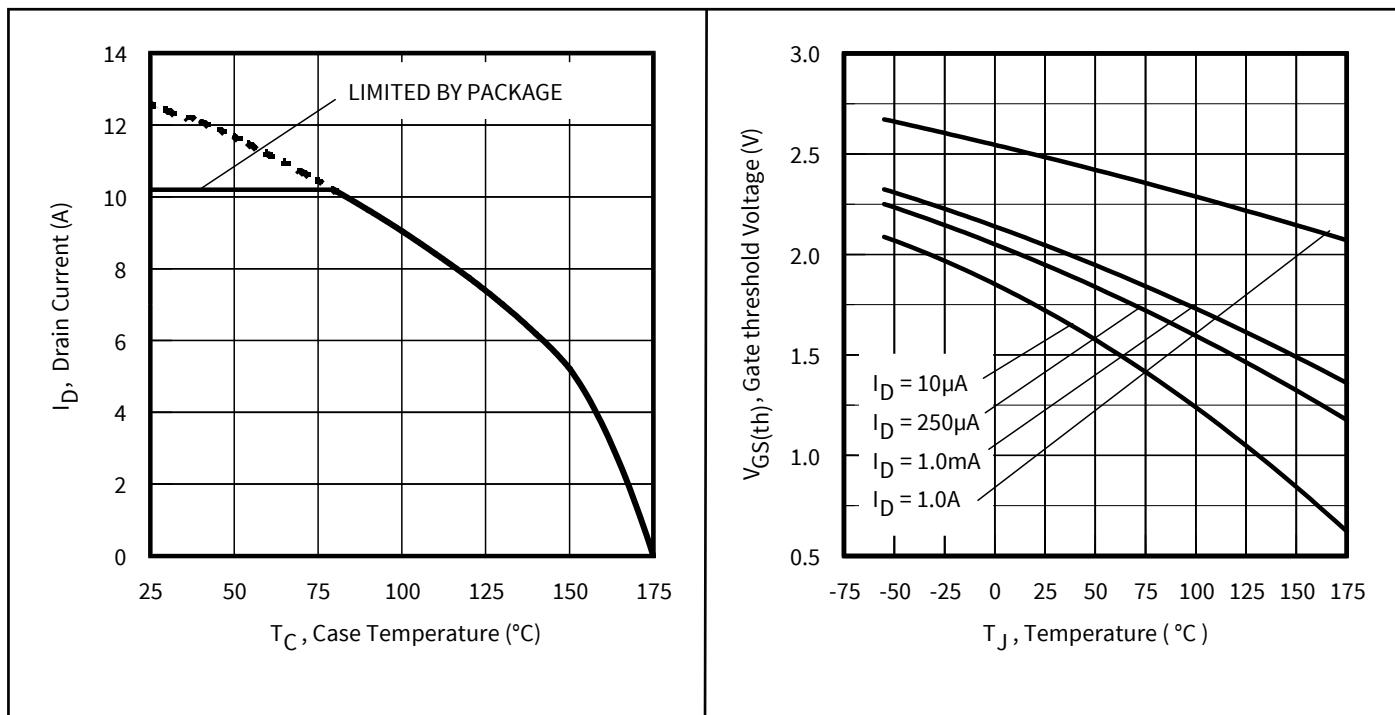


Figure 11 Maximum Drain Current vs. Case Temperature

Figure 12 Typical Threshold Voltage vs. Junction Temperature

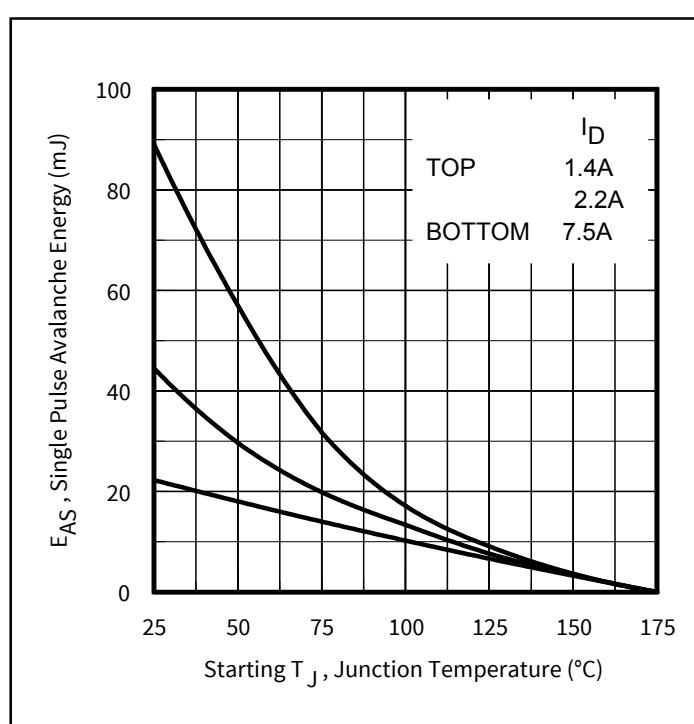
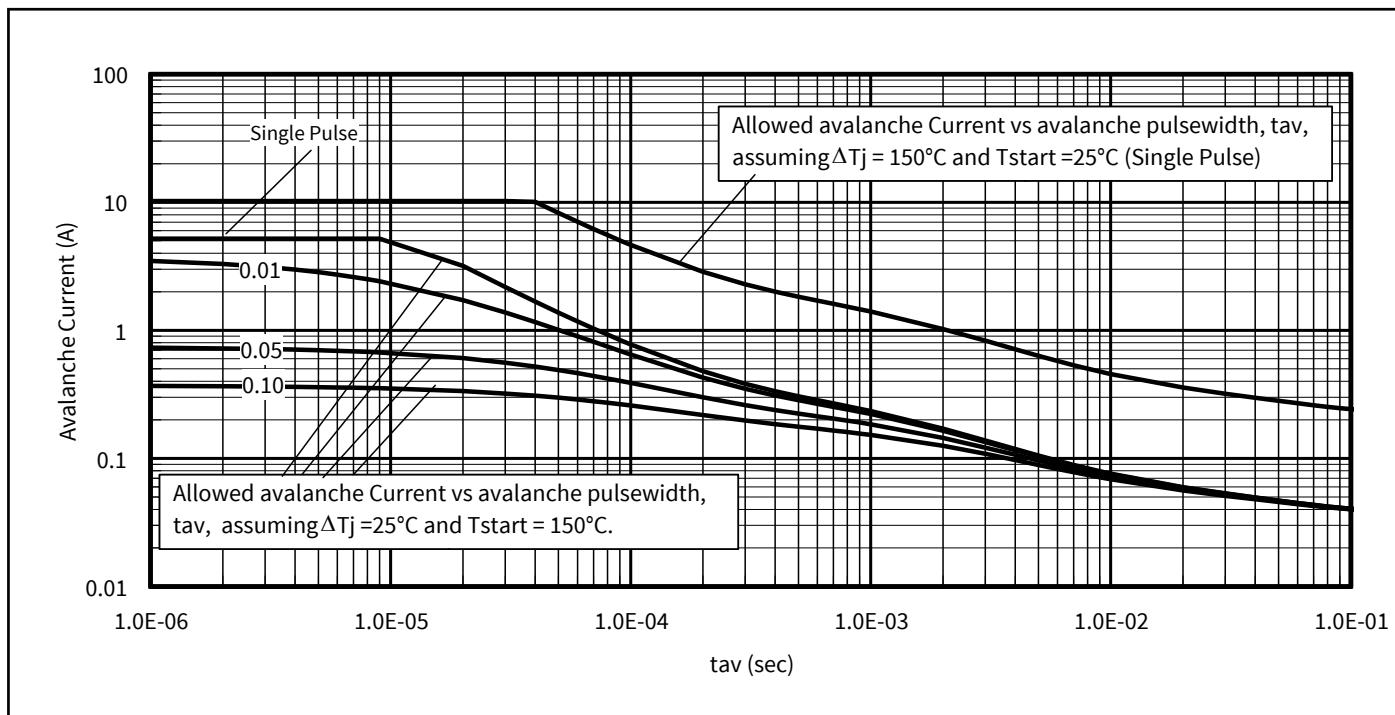
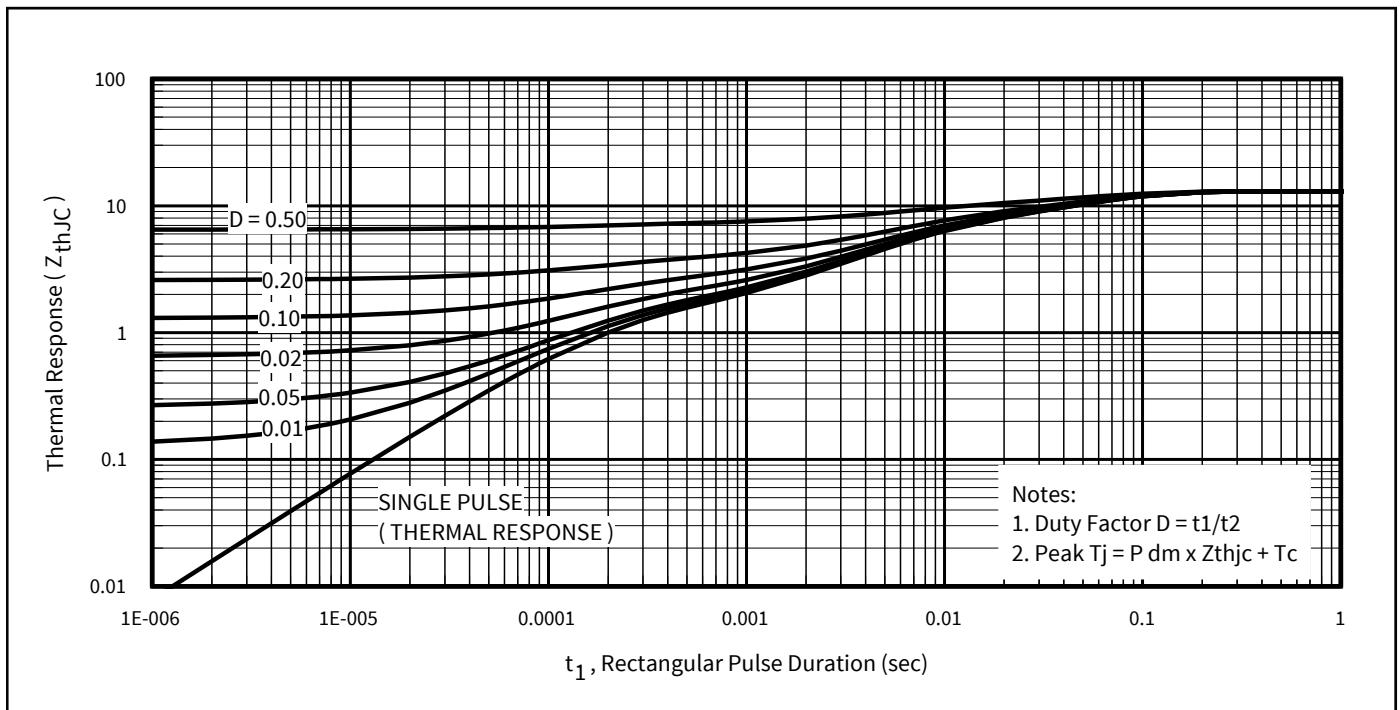
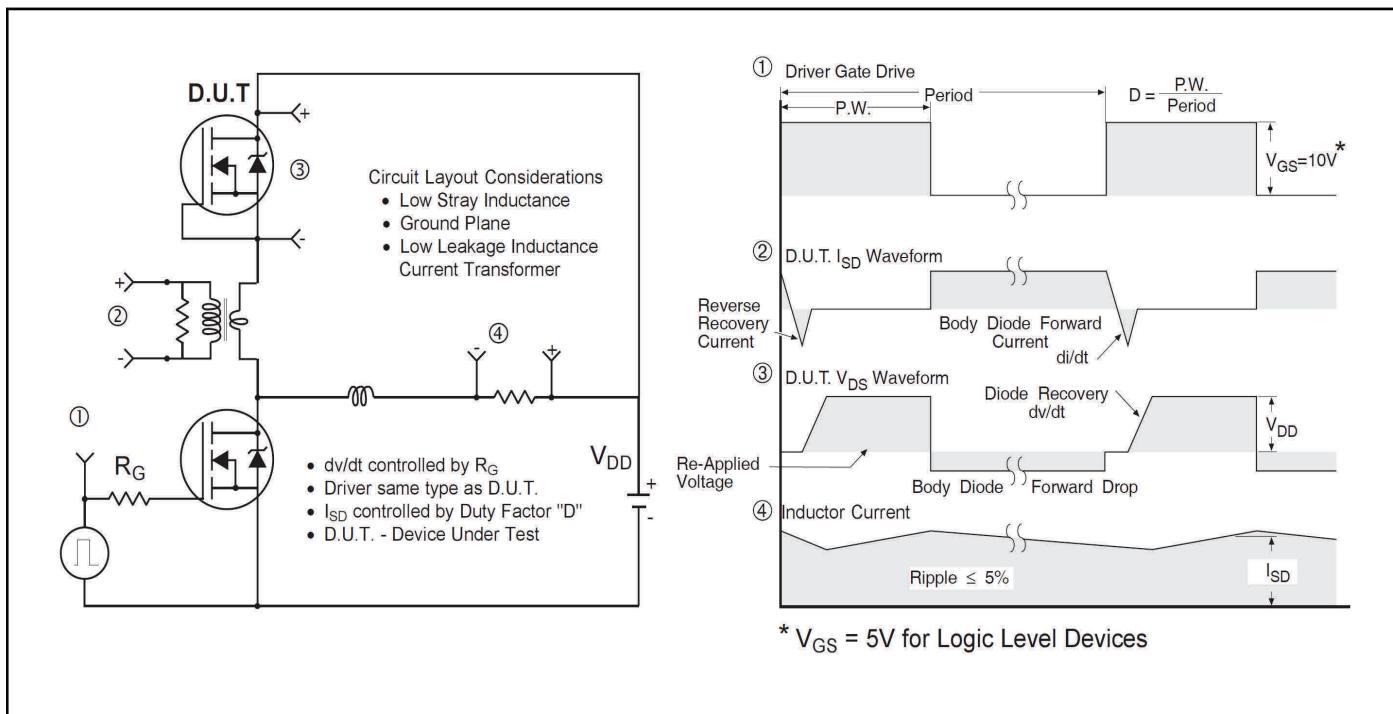
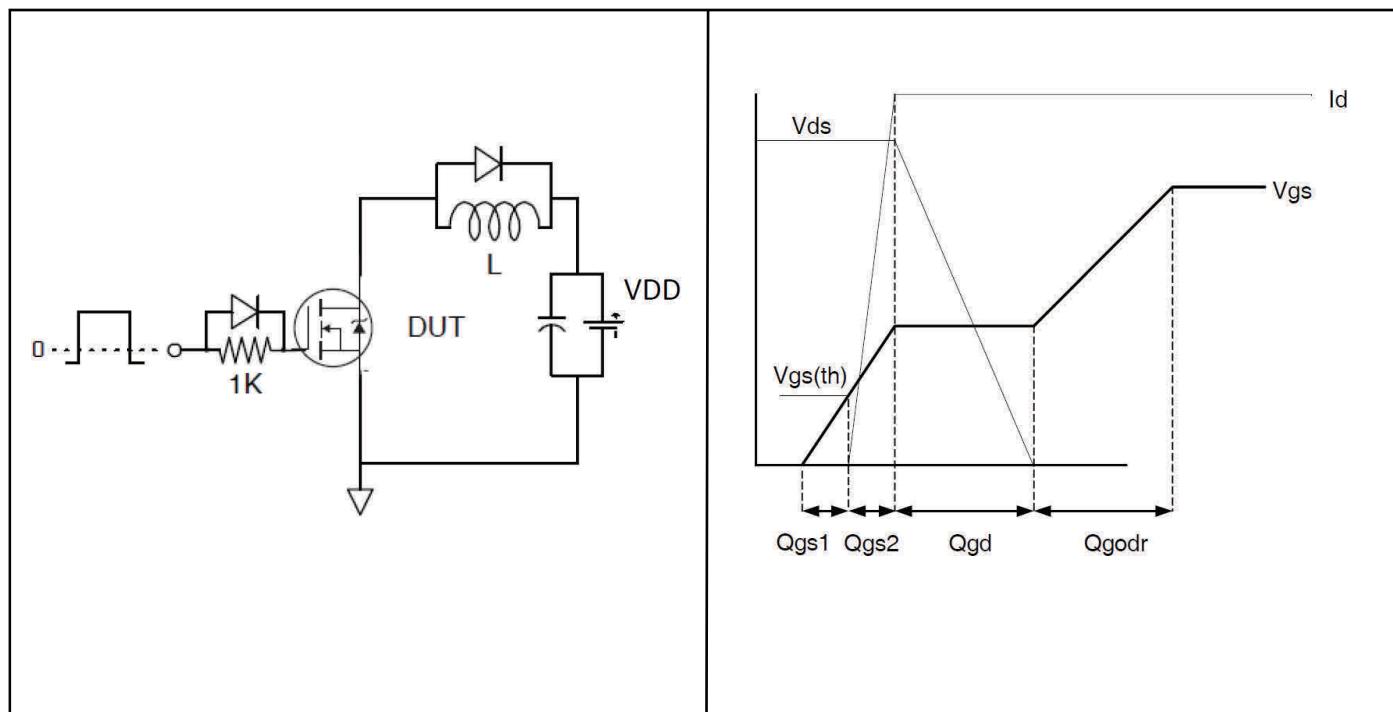


Figure 13 Maximum Avalanche Energy vs. Drain Current


Figure 14 Typical Avalanche Current vs. Pulse Width

Figure 15 Maximum Effective Transient Thermal Impedance, Junction-to-Case


Figure 16 Peak Diode Recovery dv/dt Test Circuit for N-Channel Power MOSFETs

Figure 17a Gate Charge Test Circuit
Figure 17b Gate Charge Waveform

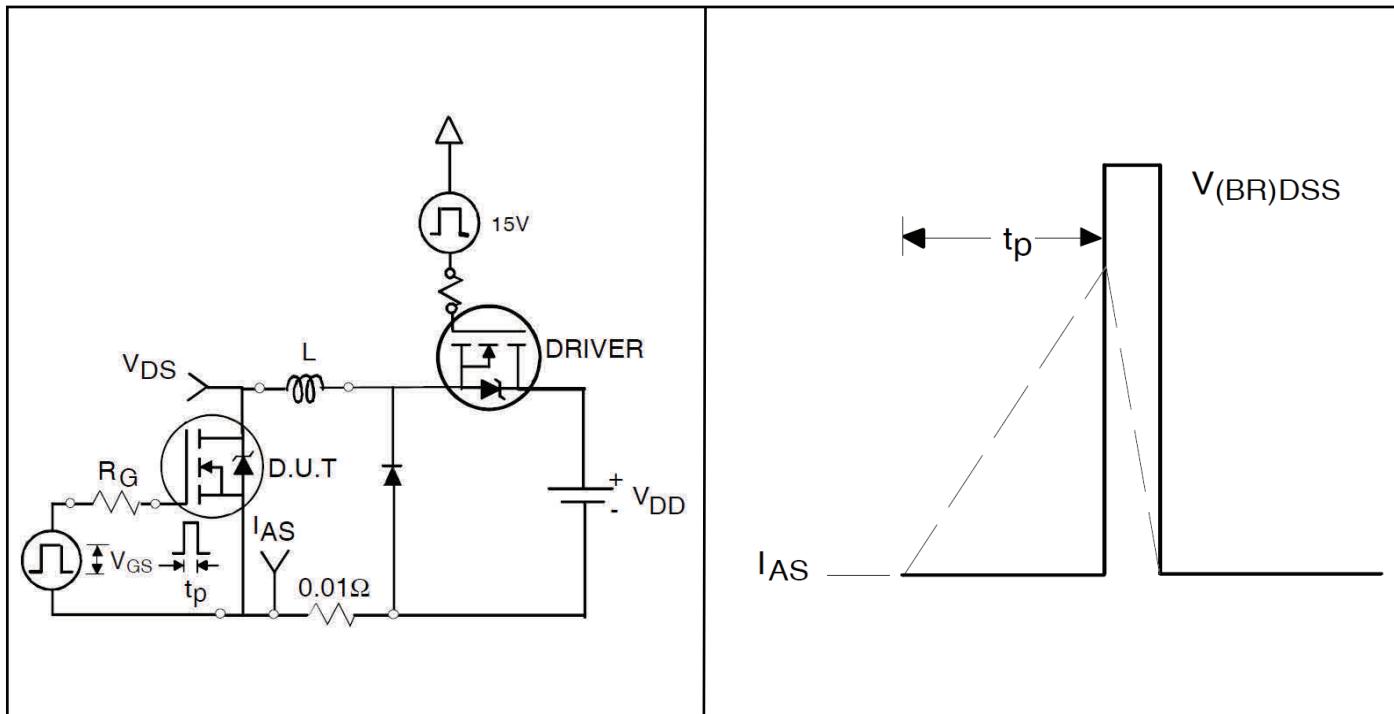

Figure 18a Unclamped Inductive Test Circuit

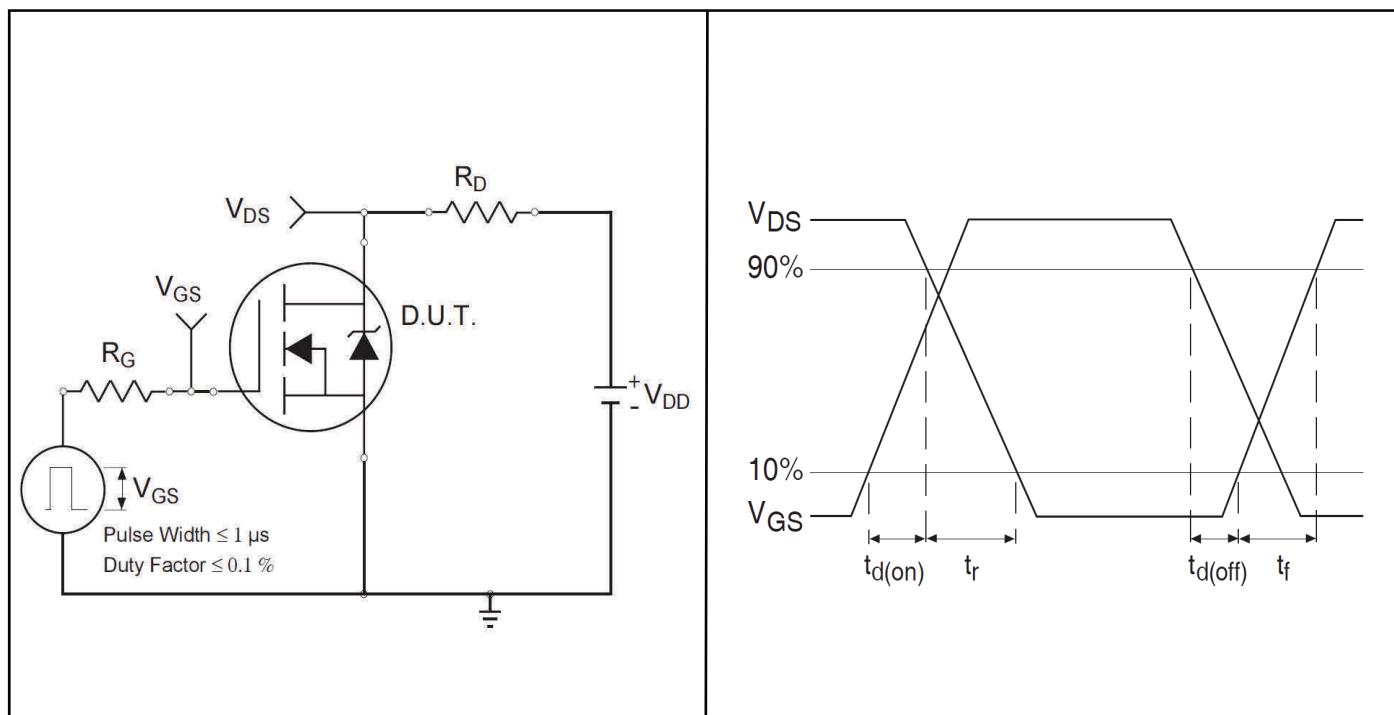
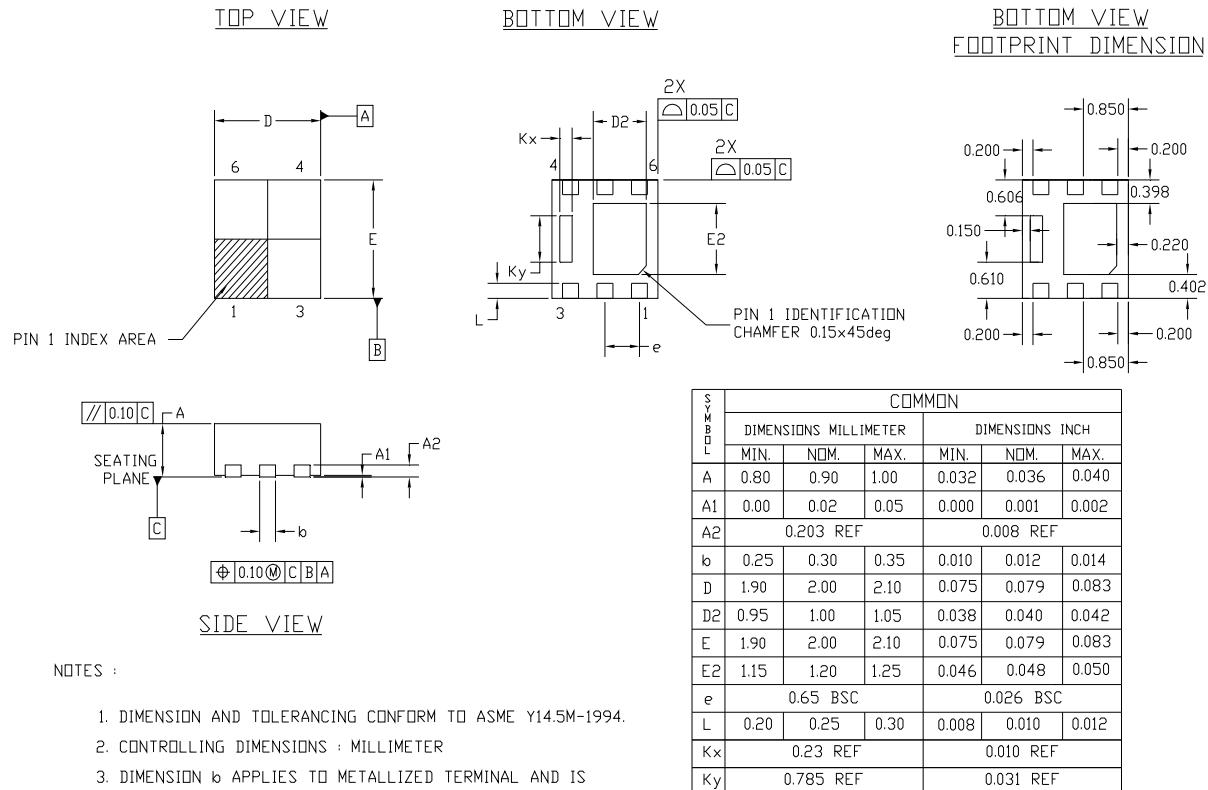
Figure 18b Unclamped Inductive Waveforms

Figure 19a Switching Time Test Circuit

Figure 19b Switching Time Waveforms

5 Package Information

PQFN 2 x 2 Outline Package Details

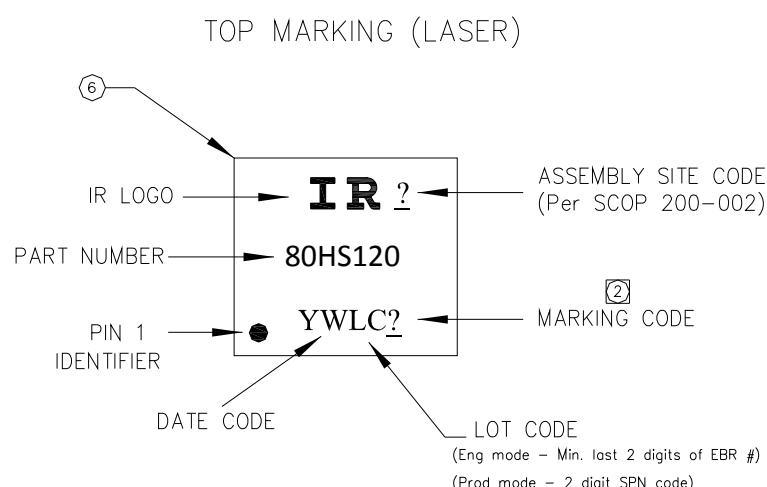

NOTES :

1. DIMENSION AND TOLERANCING CONFORM TO ASME Y14.5M-1994.
2. CONTROLLING DIMENSIONS : MILLIMETER
3. DIMENSION b APPLIES TO METALLIZED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 MM. FROM TERMINAL TIP.

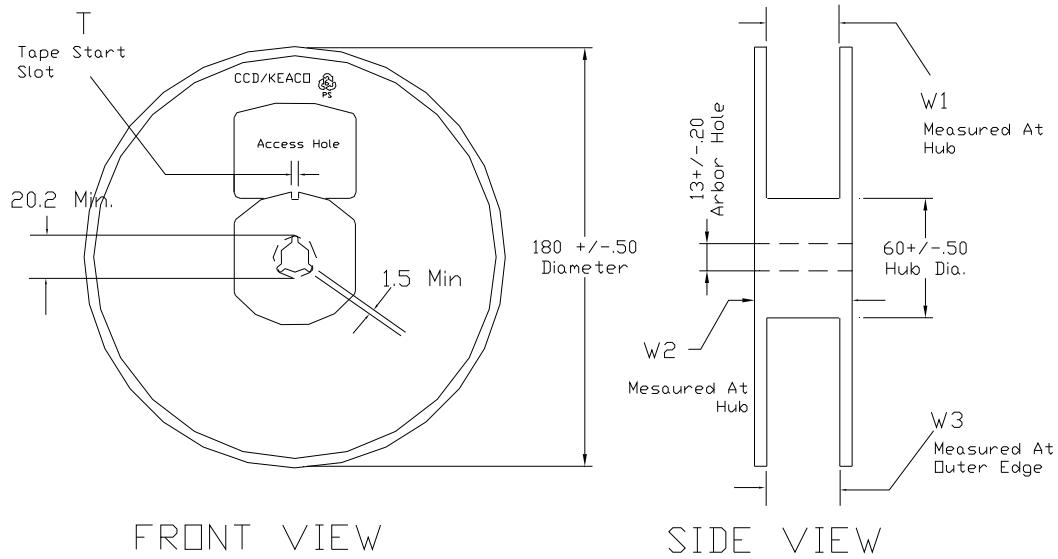
For more information on board mounting, including footprint and stencil recommendation, please refer to application note AN-1136: <http://www.infineon.com/technical-info/appnotes/an-1136.pdf>

For more information on package inspection techniques, please refer to application note AN-1154: <http://www.infineon.com/technical-info/appnotes/an-1154.pdf>

PQFN 2 x 2 Part Marking

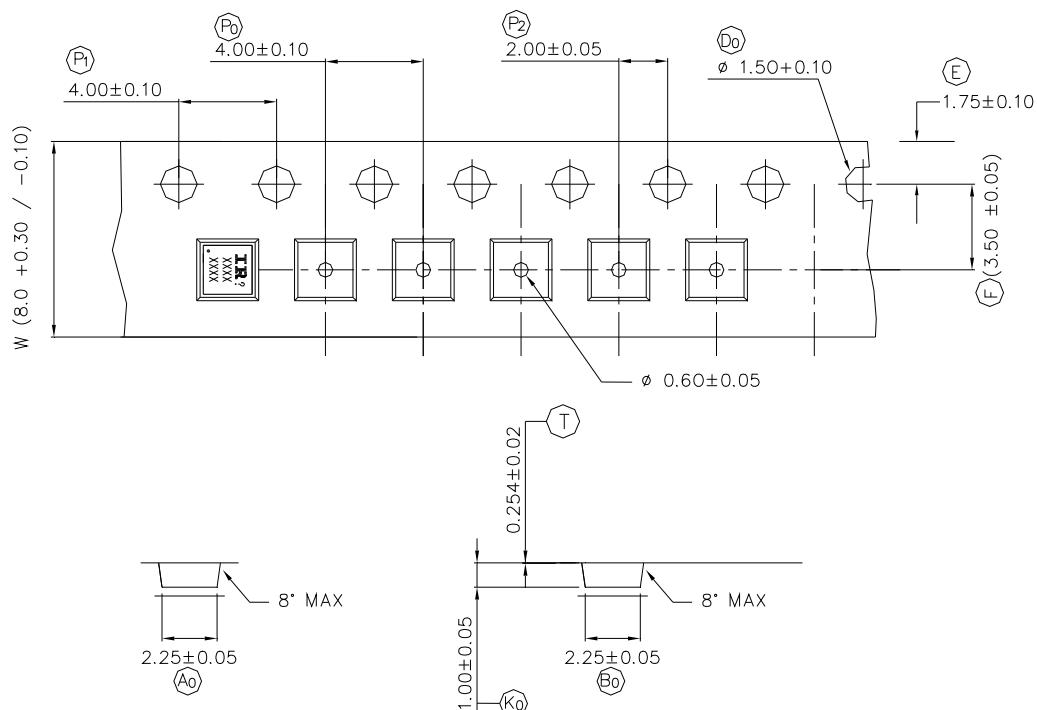


Note: For the most current drawing please refer to website at: www.irf.com/package/

IRL80HS120
Package Information
PQFN 2 x 2 Tape and Reel

TABLE 1: REEL DETAILS

TAPE WIDTH	T	W1	W2	W3	PART NO
8 MM	3 ± 0.50	$8.4^{+1.5}_{-0.0}$	14.4 Max	$7.90 \text{ Min} \quad 10.9 \text{ Max}$	91586-1
12 MM	5 ± 0.50	$12.4^{+2.0}_{-0.0}$	18.4 Max	$11.9 \text{ Min} \quad 15.4 \text{ Max}$	91586-2

Note: Surface resistivity is $\geq 1 \times 10^5$ but $< 1 \times 10^{12}$ ohm/sq.



NOTE: The Surface Resistivity is $10^4 - 10^8$ OHM/SQ

6 Qualification Information

Qualification Information

Qualification Level	Industrial (per JEDEC JESD47F) [†]	
Moisture Sensitivity Level	PQFN 2 mm x 2 mm	MSL1 (per JEDEC J-STD-020D) [†]
RoHS Compliant	Yes	

[†] Applicable version of JEDEC standard at the time of product release.

Revision History

Major changes since the last revision

Page or Reference	Revision	Date	Description of changes
All pages	1.0	2016-09-21	<ul style="list-style-type: none">First release data sheet as Provisional.
All pages	1.1	2016-10-17	<ul style="list-style-type: none">Added Switch Time test data.Datasheet released as Provisional.
All page	1.2	2017-03-29	<ul style="list-style-type: none">Parts tested as Unique datasheet with revised current and all other testsUpdated datasheet in new Infineon TemplateDatasheet completed as “Approved (Not Released)”Datasheet is not posed on Web.

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