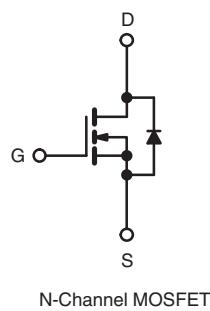
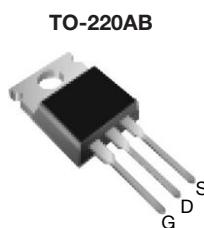


## Power MOSFET

PRODUCT SUMMARY	
$V_{DS}$ (V)	500
$R_{DS(on)}$ ( $\Omega$ )	$V_{GS} = 10$ V      3.0
$Q_g$ (Max.) (nC)	17
$Q_{gs}$ (nC)	4.3
$Q_{gd}$ (nC)	8.5
Configuration	Single



### ORDERING INFORMATION

Package	TO-220AB
Lead (Pb)-free	IRF820APbF SiHF820A-E3
SnPb	IRF820A SiHF820A

### ABSOLUTE MAXIMUM RATINGS ( $T_C = 25$ °C, unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DS}$	500	
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Continuous Drain Current	$I_D$	2.5	A
		1.6	
Pulsed Drain Current <sup>a</sup>	$I_{DM}$	10	
Linear Derating Factor		0.40	W/°C
Single Pulse Avalanche Energy <sup>b</sup>	$E_{AS}$	140	mJ
Repetitive Avalanche Current <sup>a</sup>	$I_{AR}$	2.5	A
Repetitive Avalanche Energy <sup>a</sup>	$E_{AR}$	5.0	mJ
Maximum Power Dissipation	$P_D$	50	W
Peak Diode Recovery dV/dt <sup>c</sup>	dV/dt	3.4	V/ns
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	- 55 to + 150	°C
Soldering Recommendations (Peak Temperature)	for 10 s	300 <sup>d</sup>	
Mounting Torque	6-32 or M3 screw	10	lbf · in
		1.1	N · m

#### Notes

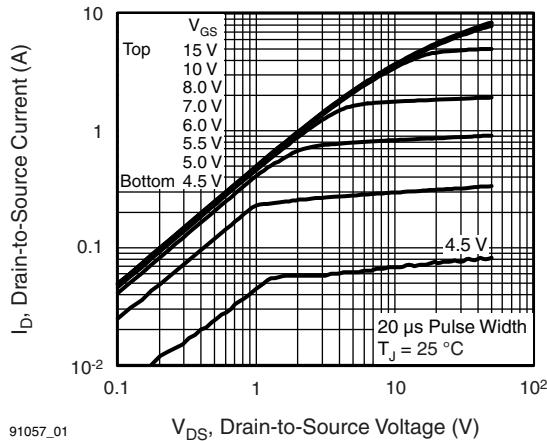
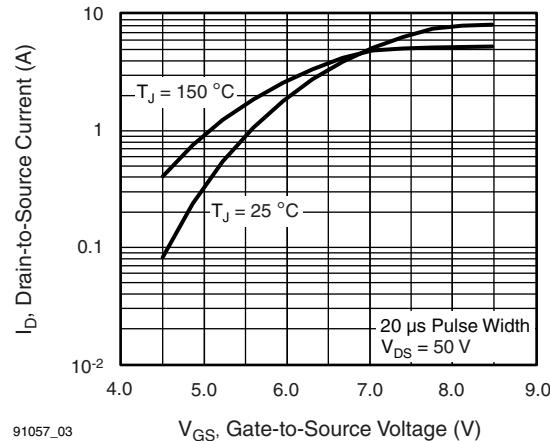
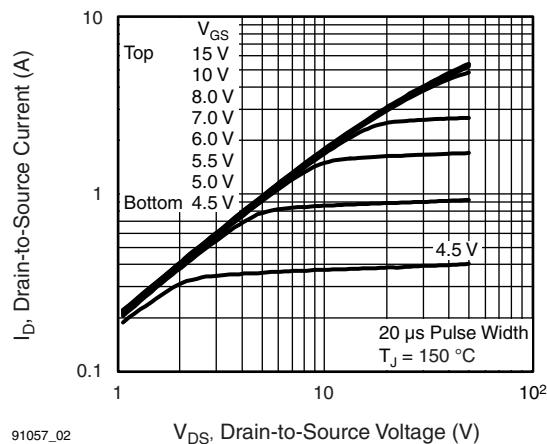
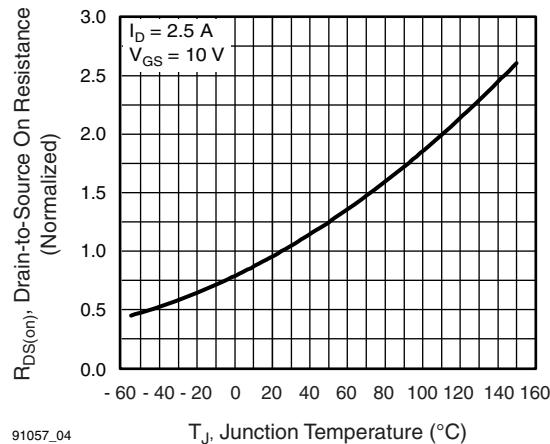
- a. Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11).
- b. Starting  $T_J = 25$  °C,  $L = 45$  mH,  $R_g = 25$  Ω,  $I_{AS} = 2.5$  A (see fig. 12).
- c.  $I_{SD} \leq 2.5$  A,  $dI/dt \leq 270$  A/μs,  $V_{DD} \leq V_{DS}$ ,  $T_J \leq 150$  °C.
- d. 1.6 mm from case.

\* Pb containing terminations are not RoHS compliant, exemptions may apply



**RoHS\***  
COMPLIANT



**TYPICAL CHARACTERISTICS** (25 °C, unless otherwise noted)

**Fig. 1 - Typical Output Characteristics,  $T_c = 25 \text{ }^\circ\text{C}$** 

**Fig. 3 - Typical Transfer Characteristics**

**Fig. 2 - Typical Output Characteristics,  $T_c = 150 \text{ }^\circ\text{C}$** 

**Fig. 4 - Normalized On-Resistance vs. Temperature**

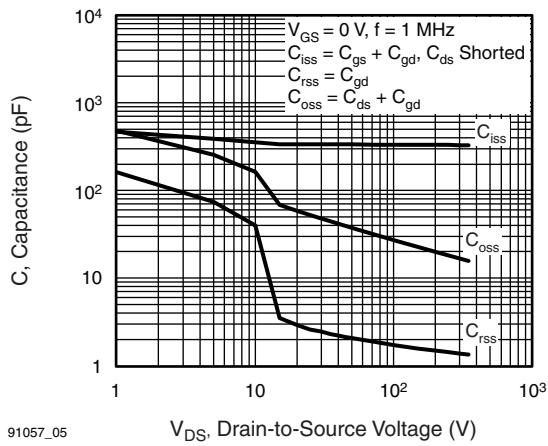


Fig. 5 - Typical Capacitance vs. Drain-to-Source Voltage

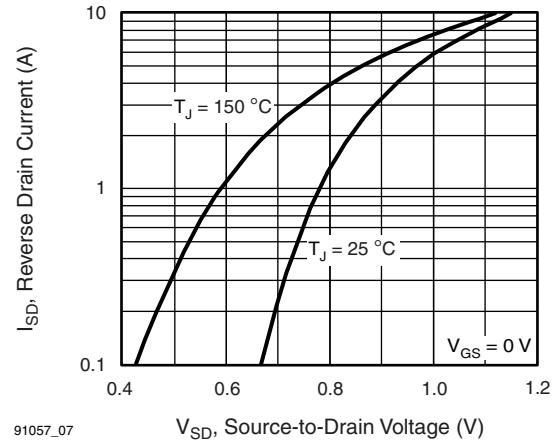


Fig. 7 - Typical Source-Drain Diode Forward Voltage

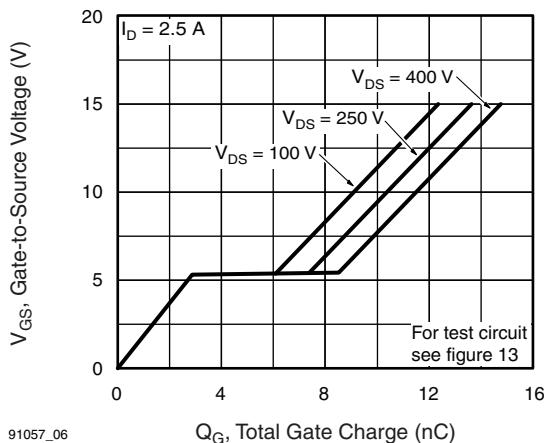


Fig. 6 - Typical Gate Charge vs. Gate-to-Source Voltage

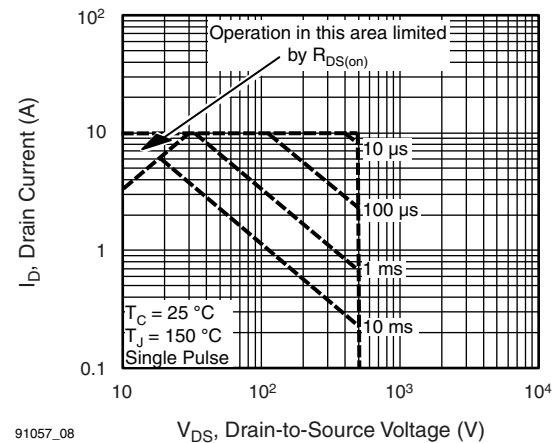
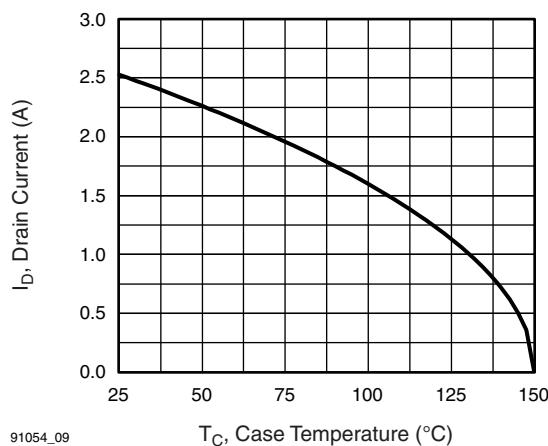
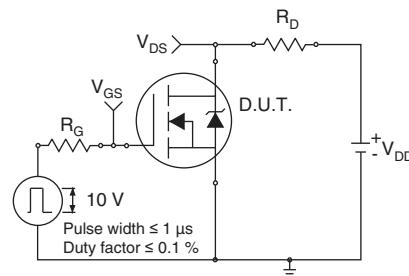
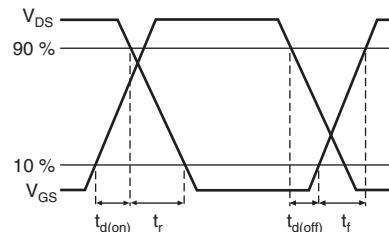
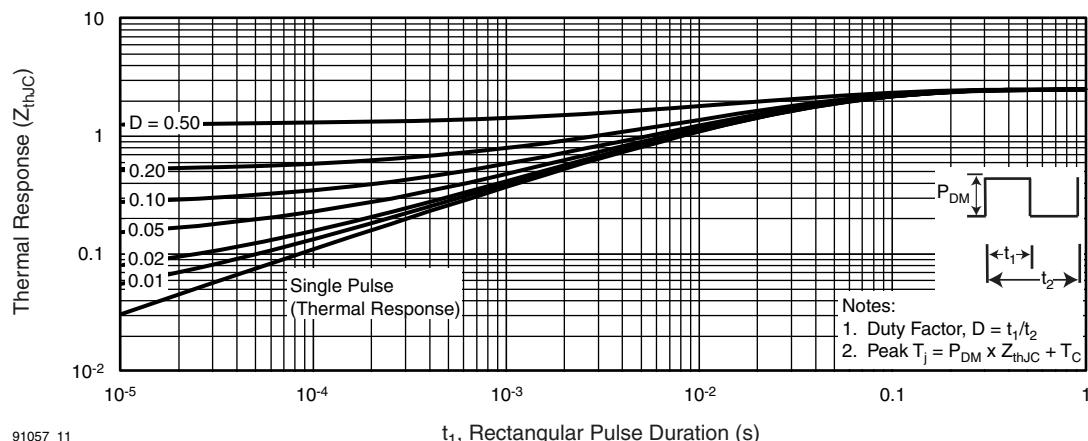
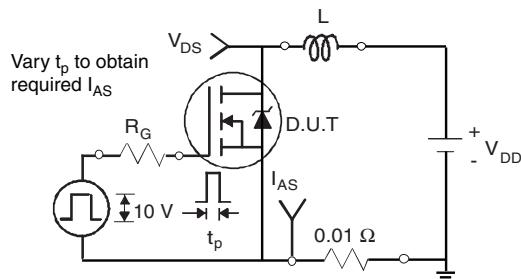
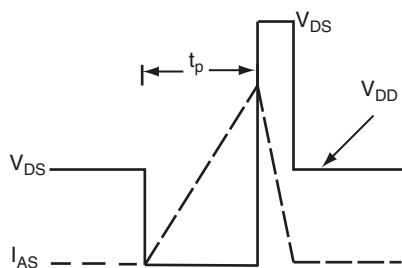
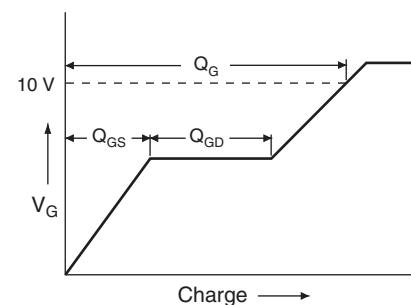


Fig. 8 - Maximum Safe Operating Area

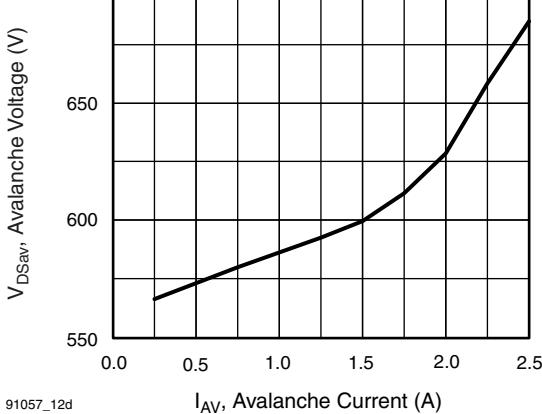

**Fig. 9 - Maximum Drain Current vs. Case Temperature**

**Fig. 10a - Switching Time Test Circuit**

**Fig. 10b - Switching Time Waveforms**

**Fig. 11 - Maximum Effective Transient Thermal Impedance, Junction-to-Case**



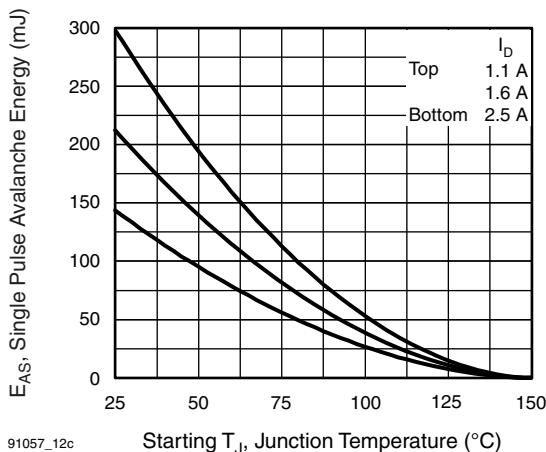
**Fig. 12a - Unclamped Inductive Test Circuit**



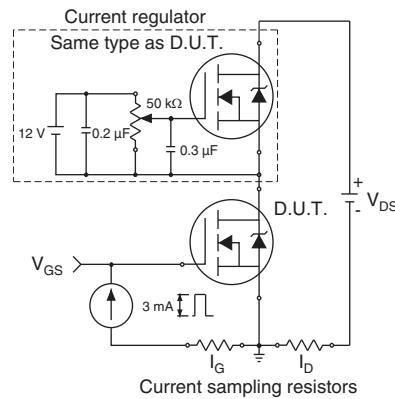
**Fig. 12b - Unclamped Inductive Waveforms**



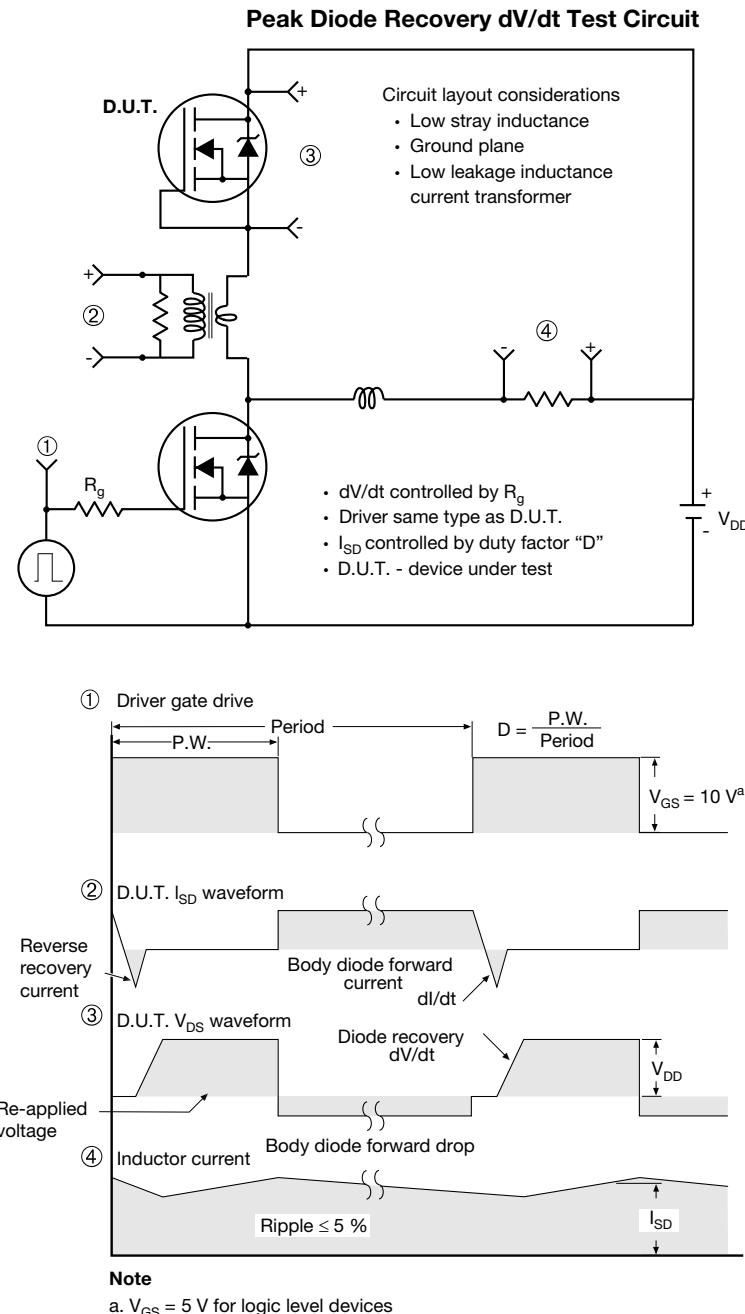
**Fig. 13a - Typical Drain-to-Source Voltage vs. Avalanche Current**



**Fig. 12c - Maximum Avalanche Energy vs. Drain Current**

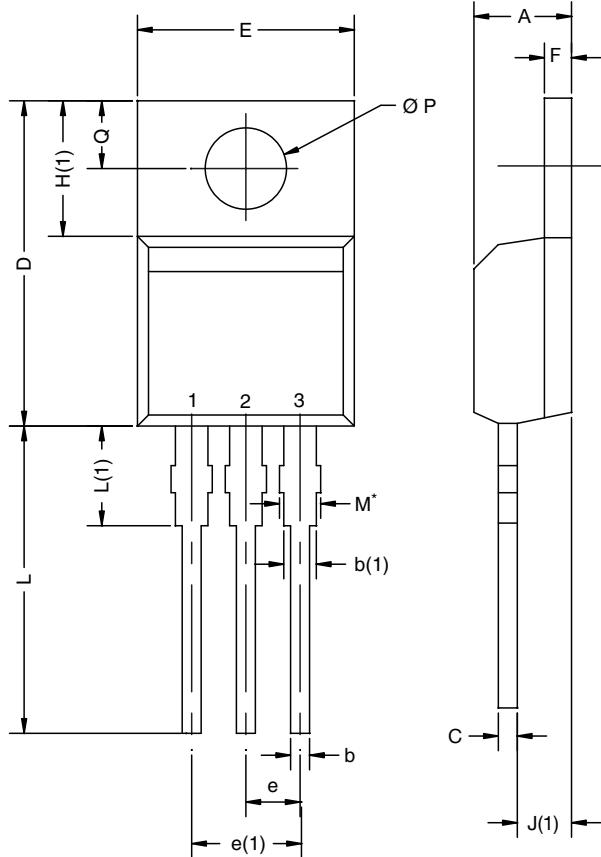


**Fig. 13b - Gate Charge Test Circuit**


**Fig. 14 - For N-Channel**

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### TO-220AB



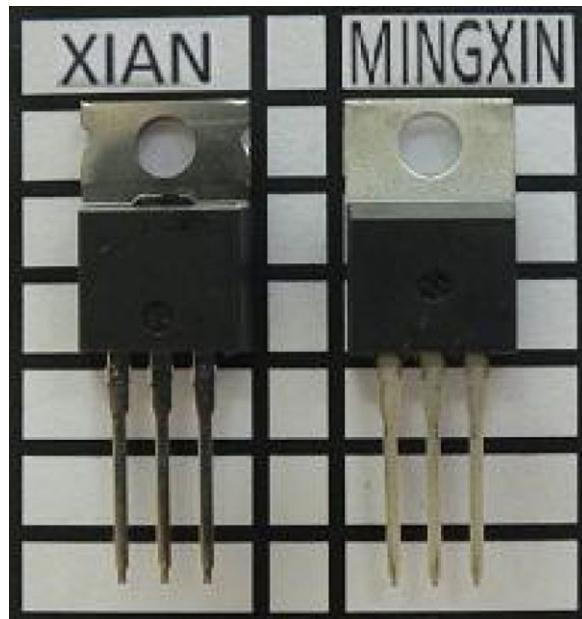
DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.25	4.65	0.167	0.183
b	0.69	1.01	0.027	0.040
b(1)	1.20	1.73	0.047	0.068
c	0.36	0.61	0.014	0.024
D	14.85	15.49	0.585	0.610
E	10.04	10.51	0.395	0.414
e	2.41	2.67	0.095	0.105
e(1)	4.88	5.28	0.192	0.208
F	1.14	1.40	0.045	0.055
H(1)	6.09	6.48	0.240	0.255
J(1)	2.41	2.92	0.095	0.115
L	13.35	14.02	0.526	0.552
L(1)	3.32	3.82	0.131	0.150
Ø P	3.54	3.94	0.139	0.155
Q	2.60	3.00	0.102	0.118

ECN: X12-0208-Rev. N, 08-Oct-12  
DWG: 5471

#### Notes

\* M = 1.32 mm to 1.62 mm (dimension including protrusion)  
Heatsink hole for HVM

- Xi'an and Mingxin actual photo





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- Консультации по применению компонента;
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