



ShenZhen LuGuang Electronic Technology. Co., Ltd.

Awarded ISO9001:2015; ISO14001:2015; IATF16949:2016;

Email:sales05@lgesemi.com Web: www.lgesemi.com

Tel: 0086-755-23981105 Fax: 0086-755-23981125

Mobile/WhatsApp:+86-18676792337 Skype ID: jokuchn

12N65

650V N-Channel MOSFET.

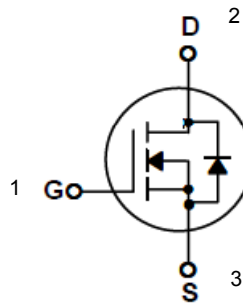
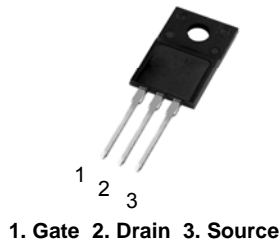
Features

- 12A, 650V, $R_{DS(on)}=0.54\Omega @V_{GS}=10\text{ V}$
- Low gate charge (typical 50.5 nC)
- Low Crss (typical 12pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

General Description

This Power MOSFET is produced by HSDQ using its own advanced planar stripe DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency switched mode power supplies, active power factor correction based on half bridge topology.

TO-220F Package



Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	650	V
I_D	Drain Current - Continuous ($T_C=25^\circ\text{C}$) - Continuous ($T_C=100^\circ\text{C}$)	12	A
		7.6*	A
I_{DM}	Drain Current - Pulsed (Note 1)	48*	A
V_{GSS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	659	mJ
I_{AR}	Avalanche Current (Note 1)	12	A
E_{AR}	Repetitive Avalanche Energy (Note 1)	67	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	5	V/ns
P_D	Power Dissipation ($T_C=25^\circ\text{C}$) - Derate above 25°C	33.2	W
		0.27	W/ $^\circ\text{C}$
T_i, T_{stg}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	$^\circ\text{C}$

* Drain current limited by maximum junction temperature

Thermal Characteristics

Symbol	Parameter	Value	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	3.77	$^\circ\text{C/W}$
$R_{\theta JS}$	Thermal Resistance, Case-to-Sink Typ.	--	$^\circ\text{C/W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	48.1	$^\circ\text{C/W}$

Electrical Characteristics <small>T_C=25°C unless otherwise noted</small>						
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0 V, I _D =250 μA	650			V
ΔBV _{DSS} / ΔT _J	Breakdown Voltage Temperature Coefficient	I _D =250 μA, Referenced to 25°C		0.64		V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =650 V, V _{GS} =0 V			1	μA
		V _{DS} =520 V, T _C =125°C			10	μA
I _{GSSF}	Gate-Body Leakage Current, Forward	V _{GS} =30 V, V _{DS} =0 V			100	nA
I _{GSSR}	Gate-Body Leakage Current, Reverse	V _{GS} =-30 V, V _{DS} =0 V			-100	nA
On Characteristics						
V _{GS(TH)}	Gate Threshold voltage	V _{DS} =V _{GS} , I _D =250 uA	2.0		4.0	V
R _{DS(On)}	Drain-Source on-state resistance	V _{GS} =10 V, I _D =6 A, T _J =25°C		0.54	0.72	Ω
g _{FS}	Forward Transconductance	V _{DS} =40 V, I _D =6 A (Note 4)		12		S
Dynamic Characteristics						
C _{ISS}	Input capacitance	V _{DS} =25 V, V _{GS} =0 V, f=1.0 MHz		2284		pF
C _{OSS}	Output capacitance			198		pF
C _{RSS}	Reverse transfer capacitance			12		pF
Switching Characteristics						
t _{d(on)}	Turn On Delay Time	V _{DD} =325 V, I _D =12 A, R _G =25 Ω (Note 4, 5)		28		ns
t _r	Rising Time			41		ns
t _{d(off)}	Turn Off Delay Time			131		ns
t _f	Fall Time			48		ns
Q _g	Total Gate Charge	V _{DS} =520 V, I _D =12 A, V _{GS} = 10 V (Note 4, 5)		50.5		nC
Q _{gs}	Gate-Source Charge			11.7		nC
Q _{gd}	Gate-Drain Charge			19.5		nC
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain-Source Diode Forward Current				10	A
I _{SM}	Maximum Pulsed Drain-Source Diode Forward Current				40	A
V _{SD}	Diode Forward Voltage	V _{GS} =0 V, I _S =12 A			1.2	V
t _{rr}	Reverse Recovery Time	V _{GS} =0 V, I _S =12 A, di _F / dt=100 A/μs		546		ns
Q _{rr}	Reverse Recovery Charge	Note 4)		4.9		μC
Notes:						
1. Repetitive Rating : Pulse width limited by maximum junction temperature						
2. L=9.2 mH, I _{AS} =12 A, V _{DD} =50V, R _G =25 Ω, Starting T _J =25°C						
3. I _{SD} ≤12A, di/dt ≤200A/us, V _{DD} ≤ BV _{DSS} , Starting T _J = 25°C						
4. Pulse Test : Pulse width ≤ 300us, Duty cycle ≤ 2%						
5. Essentially independent of operating temperature						

Typical Characteristics

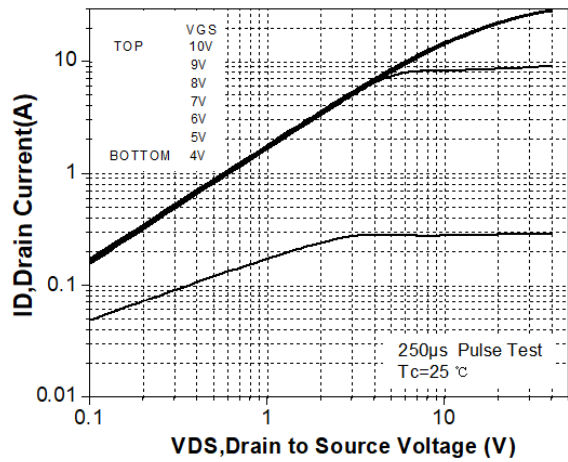


Figure 1. On-Region Characteristics

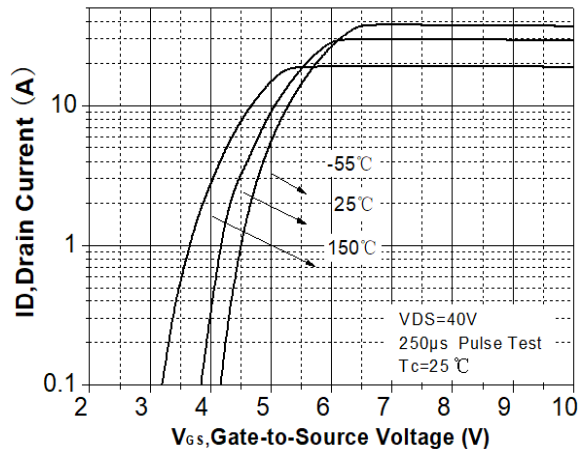


Figure 2. Transfer Characteristics

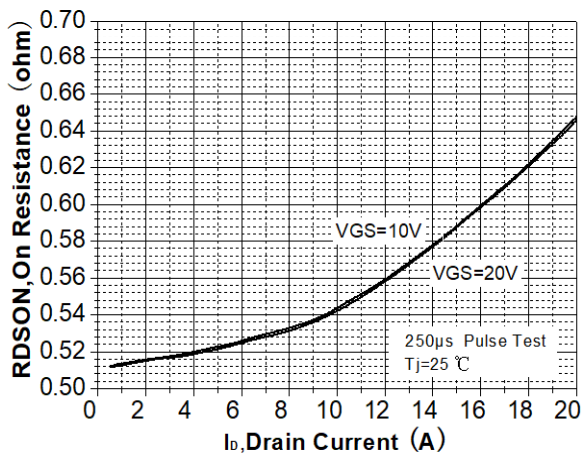


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

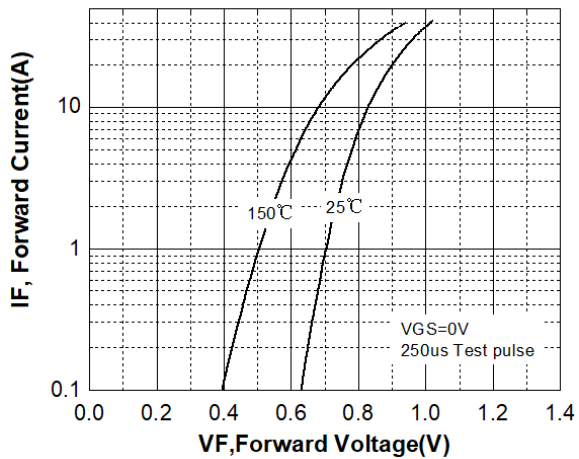


Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

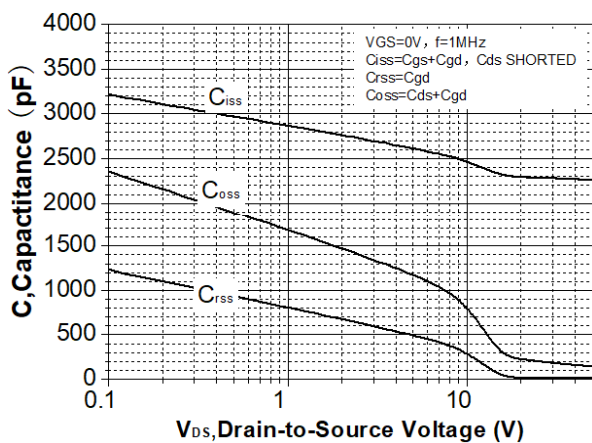


Figure 5. Capacitance Characteristics

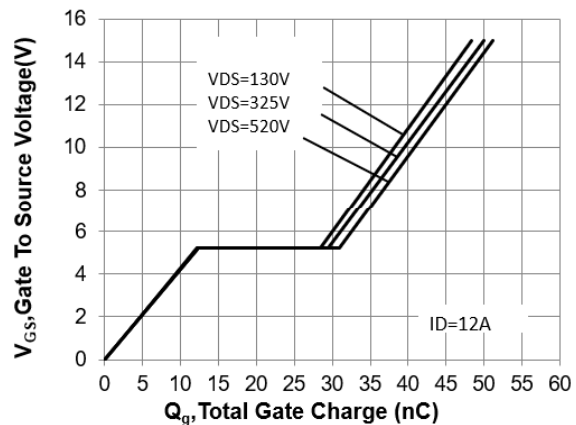


Figure 6. Gate Charge Characteristics

Typical Characteristics (Continued)

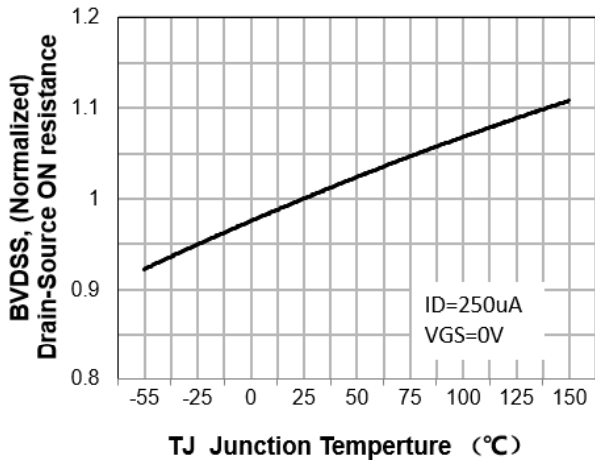


Figure 7. Breakdown Voltage Variation vs Temperature

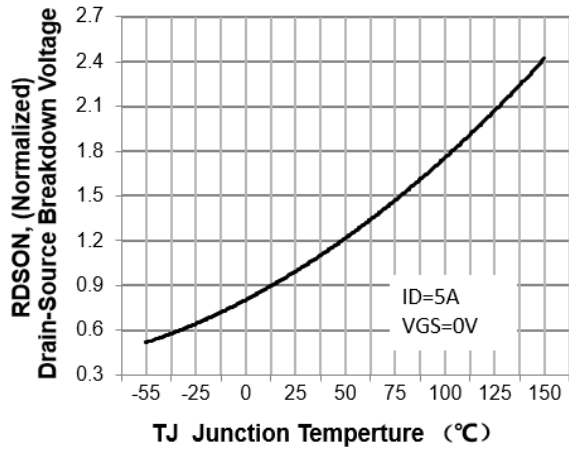


Figure 8. On-Resistance Variation vs Temperature

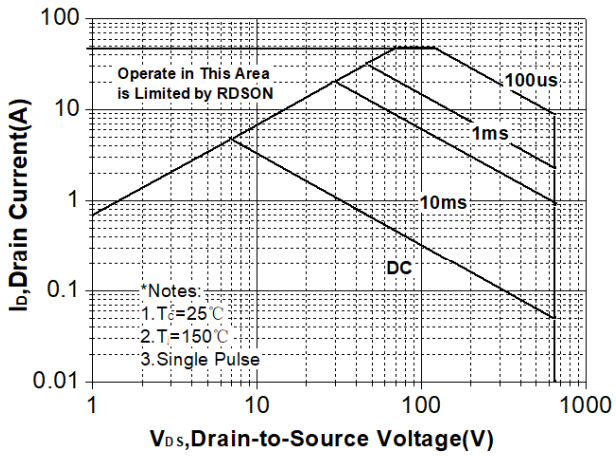


Figure 9. Maximum Safe Operating Area

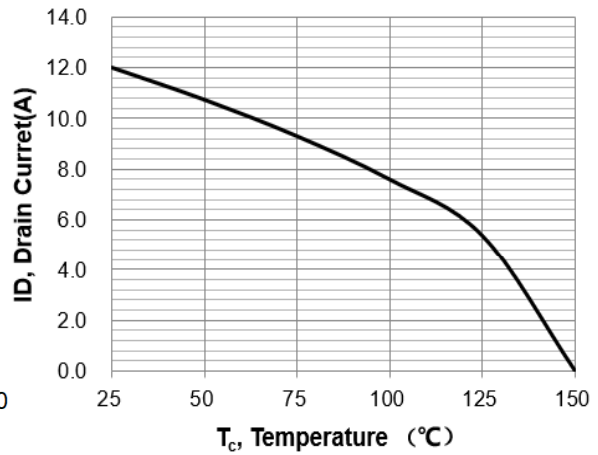


Figure 10. Maximum Drain Current vs Case Temperature

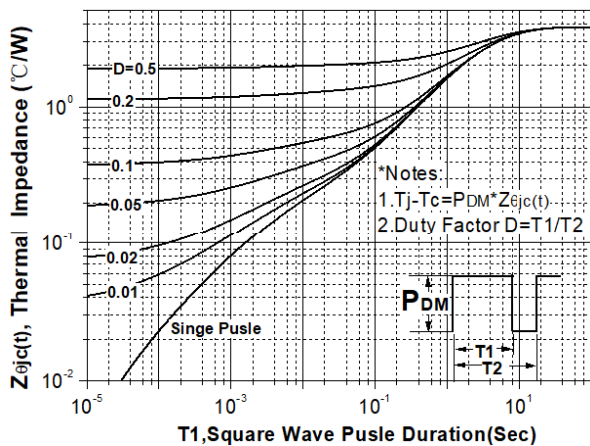
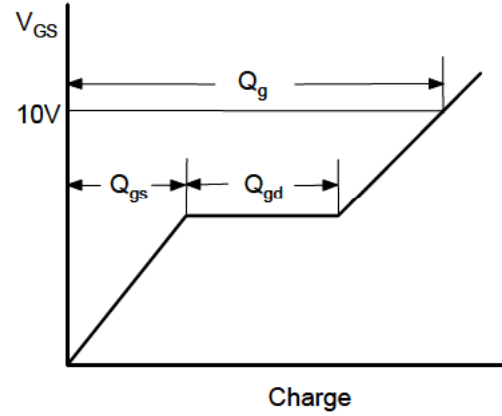
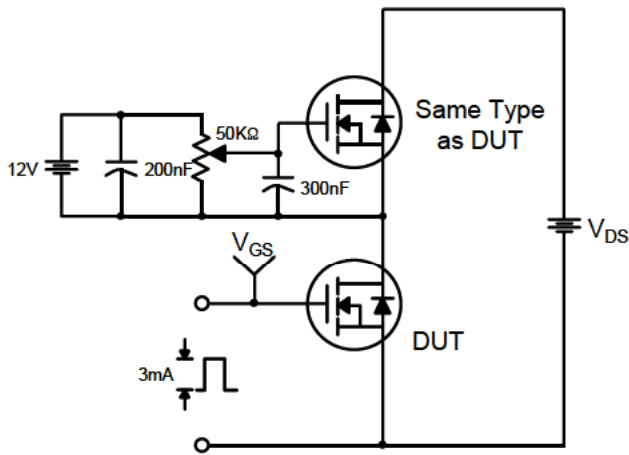
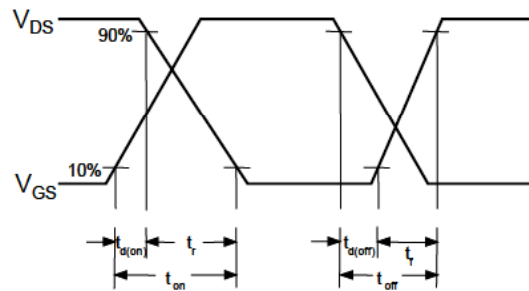
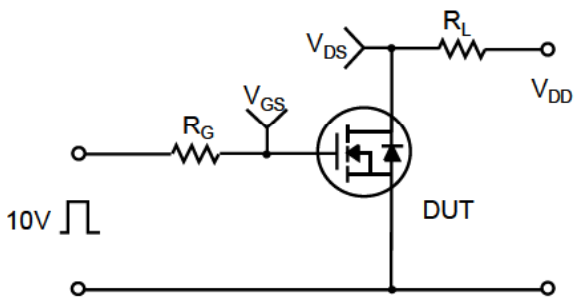


Figure 11. Transient Thermal Response Curve

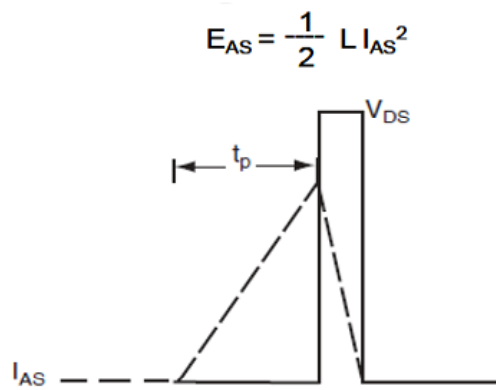
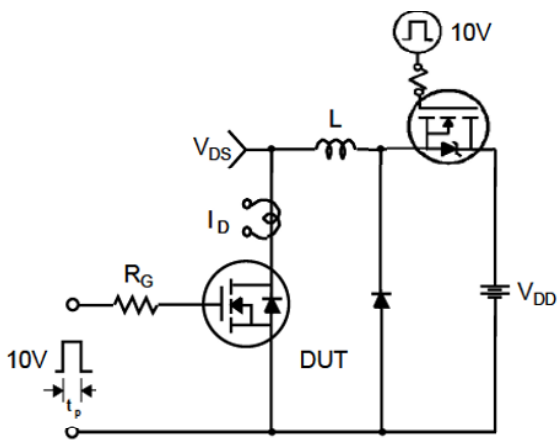
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

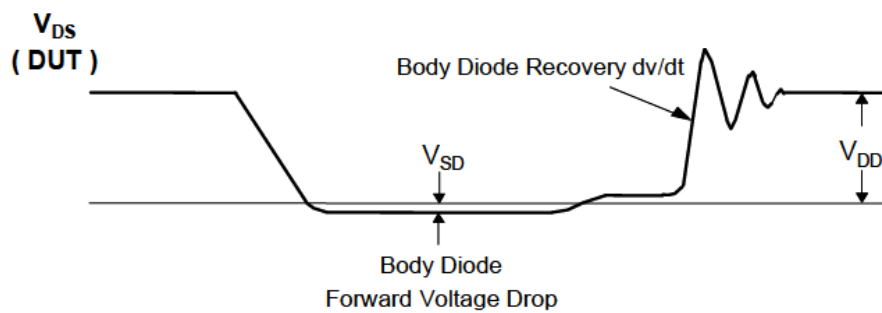
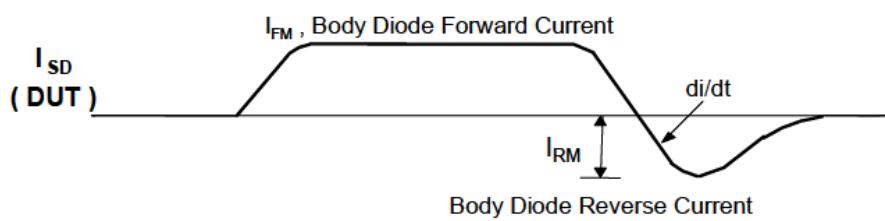
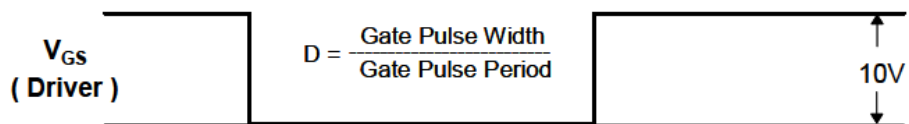
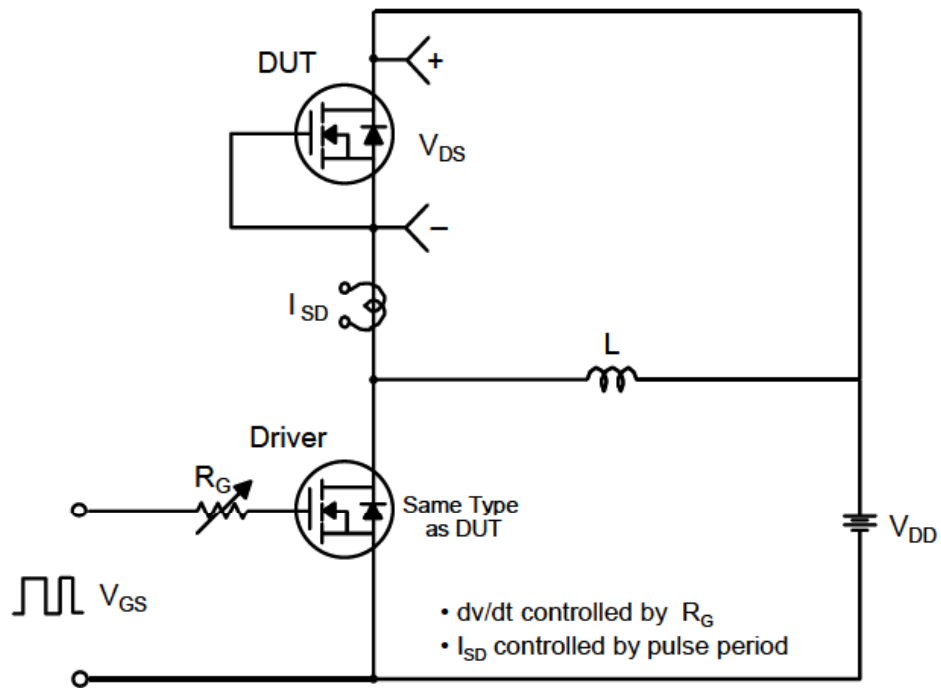


Unclamped Inductive Switching Test Circuit & Waveforms



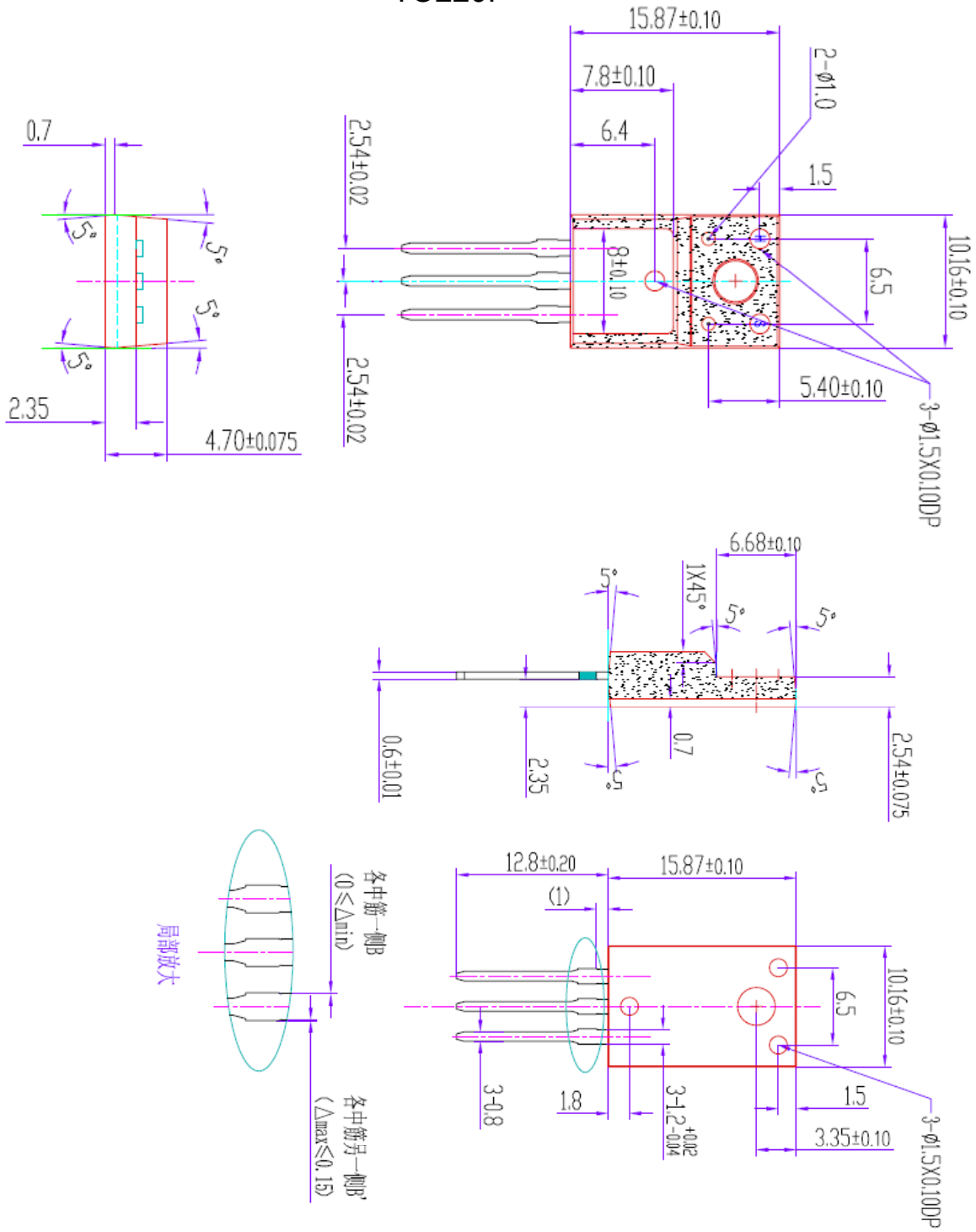
$$E_{AS} = \frac{1}{2} L I_{AS}^2$$

Peak Diode Recovery dv/dt Test Circuit & Waveforms



Package Dimensions

TO220F



X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for [MOSFET](#) category:

Click to view products by [Luguang](#) manufacturer:

Other Similar products are found below :

[614233C](#) [648584F](#) [MCH3443-TL-E](#) [MCH6422-TL-E](#) [FDPF9N50NZ](#) [FW231A-TL-E](#) [APT5010JVR](#) [NTNS3A92PZT5G](#) [IRF100S201](#)
[JANTX2N5237](#) [2SK2464-TL-E](#) [2SK3818-DL-E](#) [FCA20N60_F109](#) [FDZ595PZ](#) [STD6600NT4G](#) [FSS804-TL-E](#) [2SJ277-DL-E](#) [2SK1691-DL-](#)
[E](#) [2SK2545\(Q,T\)](#) [D2294UK](#) [405094E](#) [423220D](#) [MCH6646-TL-E](#) [TPCC8103,L1Q\(CM](#) [367-8430-0972-503](#) [VN1206L](#) [424134F](#) [026935X](#)
[051075F](#) [SBVS138LT1G](#) [614234A](#) [715780A](#) [NTNS3166NZT5G](#) [751625C](#) [873612G](#) [IRF7380TRHR](#) [IPS70R2K0CEAKMA1](#)
[RJK60S3DPP-E0#T2](#) [RJK60S5DPK-M0#T0](#) [APT5010JVFR](#) [APT12031JFLL](#) [APT12040JVR](#) [DMN3404LQ-7](#) [NTE6400](#) [JANTX2N6796U](#)
[JANTX2N6784U](#) [JANTXV2N5416U4](#) [SQM110N05-06L-GE3](#) [SIHF35N60E-GE3](#) [2SK2614\(TE16L1,Q\)](#)