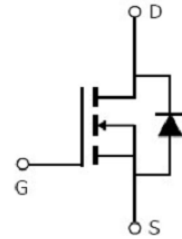


Main Product Characteristics:

V_{DSS}	650V
$R_{DS(on)}$	0.23 (typ.)
I_D	15A



TO-220F

 Marking and Pin
Assignments

Schematic Diagram

Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150 operating temperature


Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-

Absolute max Rating:

Symbol	Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	15	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$	9.5	
I_{DM}	Pulsed Drain Current	45	
$P_D @ T_C = 25^\circ C$	Power Dissipation	32	W
V_{DS}	Drain-Source Voltage	650	V
V_{GS}	Gate-to-Source Voltage	± 30	V
E_{AS}	Single Pulse Avalanche Energy @ $L=20mH$	382	mJ
I_{AS}	Avalanche Current @ $L=20mH$	6.2	A
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to +150	$^\circ C$



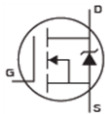
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
R	Junction-to-case		3.9	/W
R _A	Junction-to-ambient (62.5	/W

Electrical Characterizes @T_A=25 unless otherwise specified

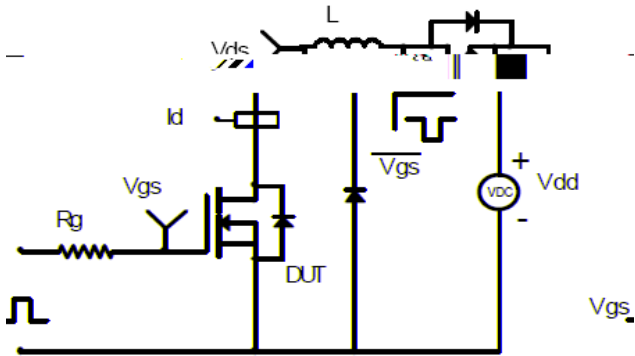
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)DSS}	Drain-to-Source breakdown voltage	650			V	V _{GS} = 0V, I _D
R _{DS(on)}	Static Drain-to-Source on-resistance		0.23	0.29		V _{GS} =10V, I _D = 7.5A
V _{GS(th)}	Gate threshold voltage	2.7		3.7	V	V _{DS} = V _{GS} , I _D
I _{DSS}	Drain-to-Source leakage current			1		V _{DS} = 650V, V _{GS} = 0V
I _{GSS}	Gate-to-Source forward leakage			100	nA	V _{GS} = 30V
				-100		V _{GS} = -30V
C _{iss}	Input capacitance		1184		pF	V _{GS} = 0V
C _{oss}	Output capacitance		47			V _{DS} = 100V
C _{rss}	Reverse transfer capacitance		1.65			100kHz
Q _g	Total gate charge		20		nC	I _D = 8A, V _{DS} =400V, V _{GS} = 10V
Q _{gs}	Gate-to-Source charge		5			
Q _{gd}	Gate-to-Drain("Miller") charge		7			
t _{d(on)}	Turn-on delay time		25		nS	V _{GS} =10V, V _{DD} =300V, R _{GEN} =10 Ω I _D =15A
t _r	Rise time		39			
t _{d(off)}	Turn-Off delay time		65			
t _f	Fall time		38			

Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I _S	Continuous Source Current (Body Diode)			15	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I _{SM}	Pulsed Source Current (Body Diode)			45	A	
V _{SD}	Diode Forward Voltage			1.3	V	I _S =15A, V _{GS} =0V
t _{rr}	Reverse Recovery Time		260		nS	T _J = 25°C, I _F =8A, di/dt =
Q _{rr}	Reverse Recovery Charge		3		uC	10 O

Test Circuits and Waveforms

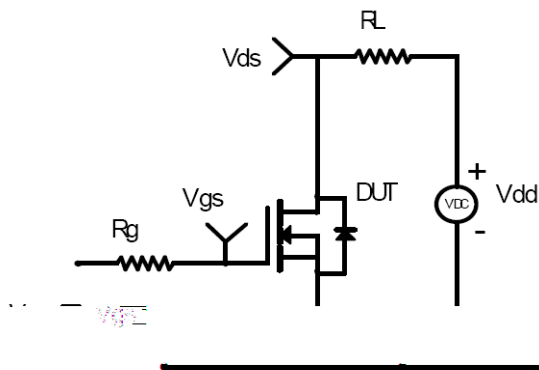
EAS Test Circuit:



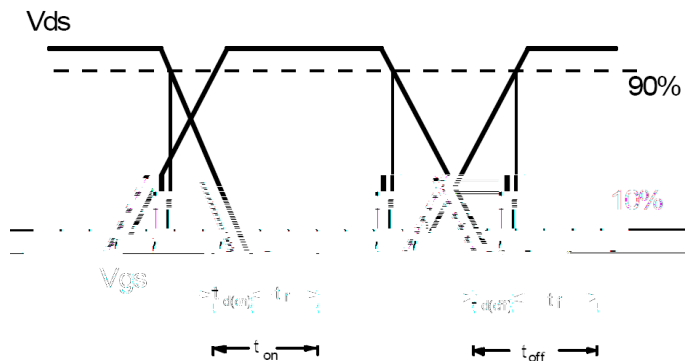
Gate Charge Test Circuit:



Switching Time Test Circuit:



Switching Waveforms:



Notes:

The maximum current rating is limited by bond-wires.

Repetitive rating; pulse width limited by max. junction temperature.

The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

The value of R_A is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$

Typical electrical and thermal characteristics

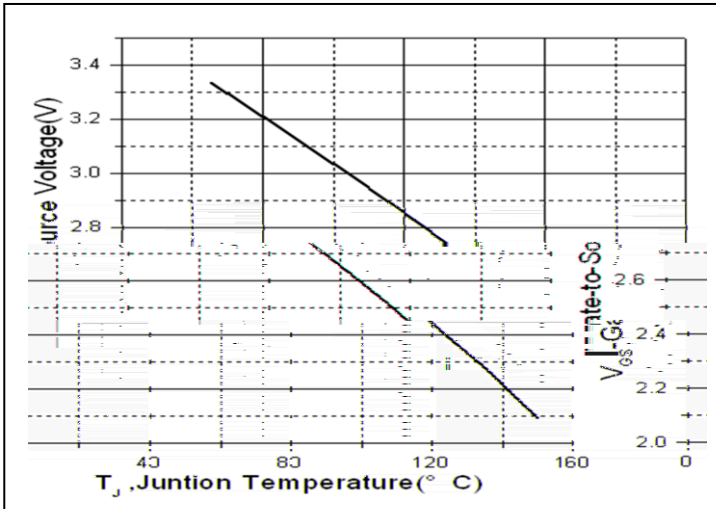


Figure7. Normalized $V_{GS(th)}$ vs. Junction Temperature

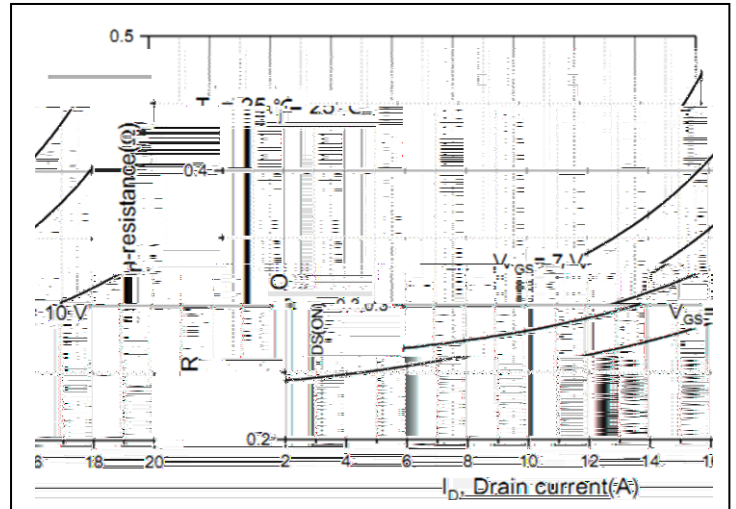


Figure8. Drain-to-Source On-state Resistance

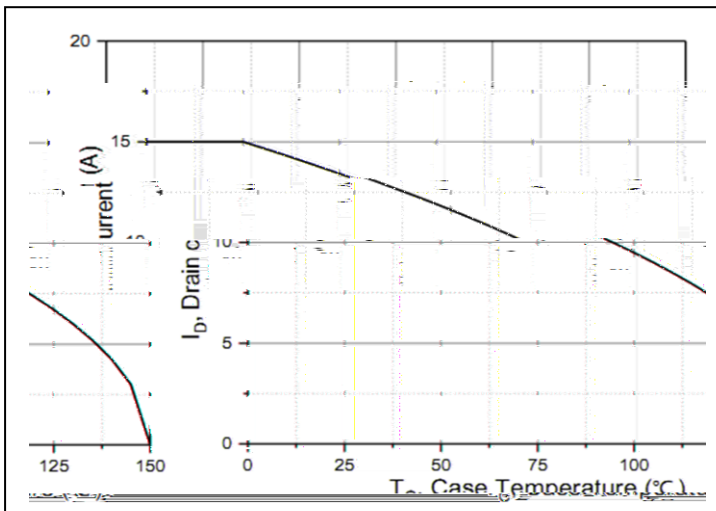


Figure9. Drain Current

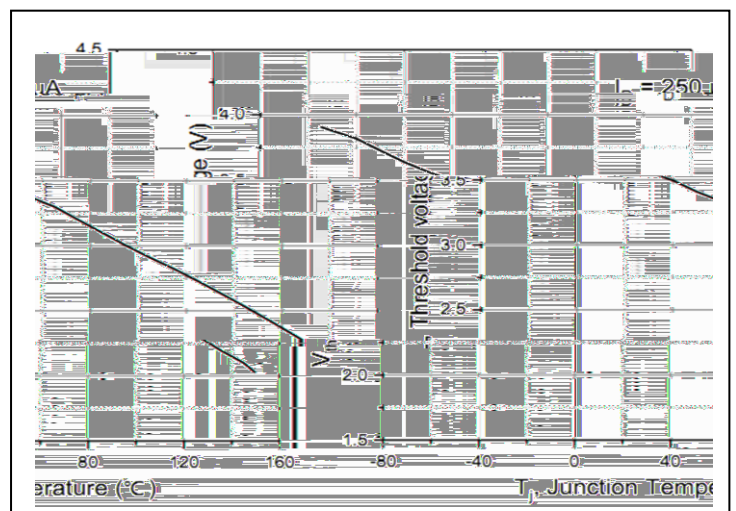


Figure10. Threshold Voltage

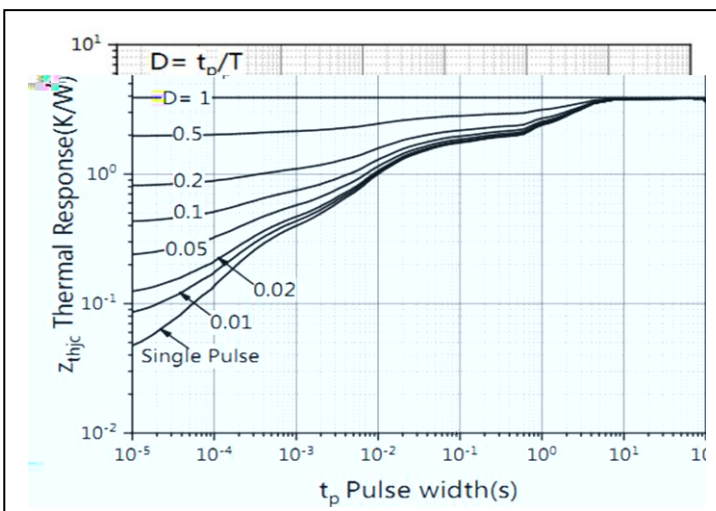


Figure11. Transient Thermal Impedance

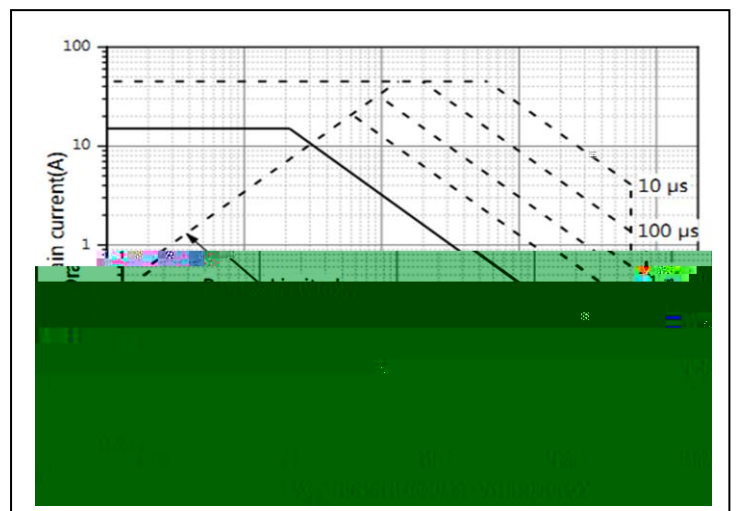


Figure12.Safe Operation Area

Mechanical Data



SYMBOL		mm	
MAX		MIN	NOM
10.36	E	9.96	10.16
2.54	A	2.34	2.54
0.50	A1	0.40	0.50
5.57	L1	5.08	5.57
15.87	ΦP	15.24	15.87
16.17	ΦP	15.24	16.17
6.70REF	H1	6.35	6.70
2.54BSC	A	2.34	2.54
12.68	L1	12.19	12.68
12.98	ΦP	12.19	12.98
13.28	ΦP	12.19	13.28
2.88	L1	2.54	2.88
3.03	ΦP	2.54	3.03
3.18	ΦP	2.54	3.18
3.18	F3	2.54	3.18
3.45	F3	2.54	3.45
1.55	G3	1.25	1.55
1.25	b1	1.18	1.25
1.43	b2	1.18	1.43
0.80	b2	0.76	0.80
0.95	b2	0.76	0.95



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