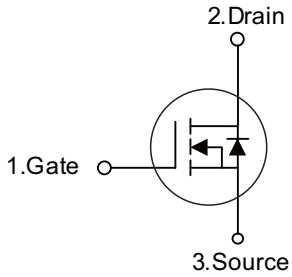
■ PRODUCT CHARACTERISTICS

VDSS	100V
R_{DS}(on)Typ(@V_{GS}=10 V)	90mΩ
R_{DS} (on)Typ(@V_{GS} =4.5V)	120mΩ
Qg@type	25nC
ID	15A

Symbol



■ FEATURES

* High Cell Density Trench Technology
* High Power and Current Handling Capability

TO-220

TO-220F

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT15N10F	TO-220F	50 pieces/Tube
N/A	MOT15N10A	TO-220	50 pieces/Tube

■ ABSOLUTE MAXIMUM RATINGS (T_C = 25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	±20	V
Drain Current	Continuous	I_D	15	A
	Pulsed (Note 2)	I_{DM}	30	A
Peak Diode Recovery dv/dt (Note 4)		dv/dt	10	V/ns
Power Dissipation	TO-220	P_D	88	W
	TO-220F		30	W
Junction Temperature		T_J	+150	°C
Storage Temperature Range		T_{STG}	-55 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. I_{SD} ≤15A, di/dt ≤ 200A/μs, V_{DD} ≤ $V_{(BR)DSS}$, T_J = 25°C.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220/TO-220F	θ_{JA}	62.5	°C/W
Junction to Case	TO-220	θ_{JC}	1.42	°C/W
	TO-220F		4.17	°C/W

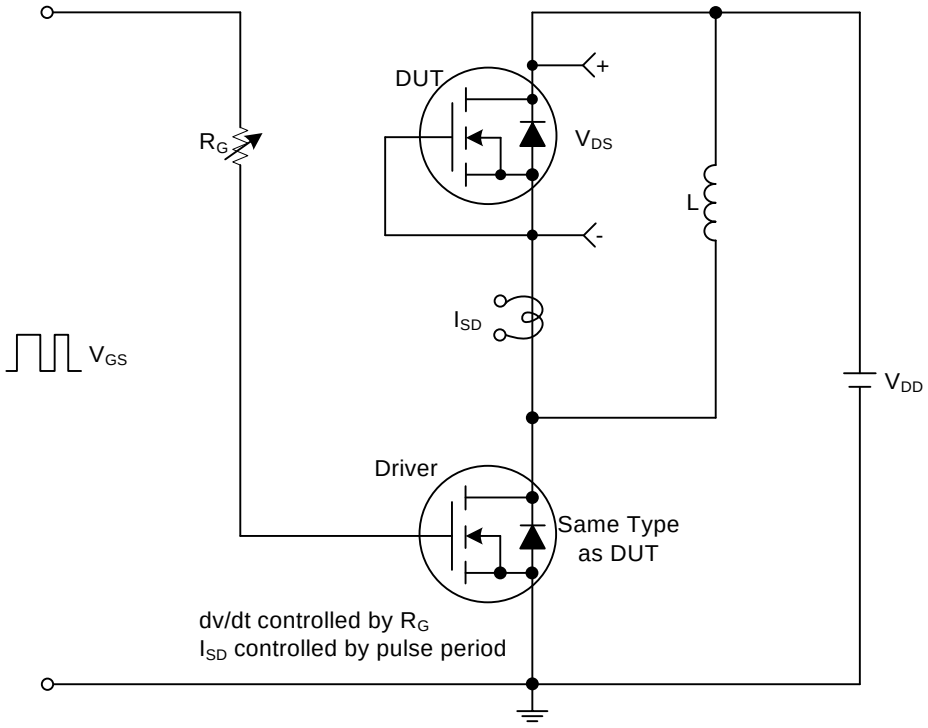
Note: Device mounted on FR 4 substrate PC board, 2oz copper, with 1inch square copper plate.

■ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise noted)

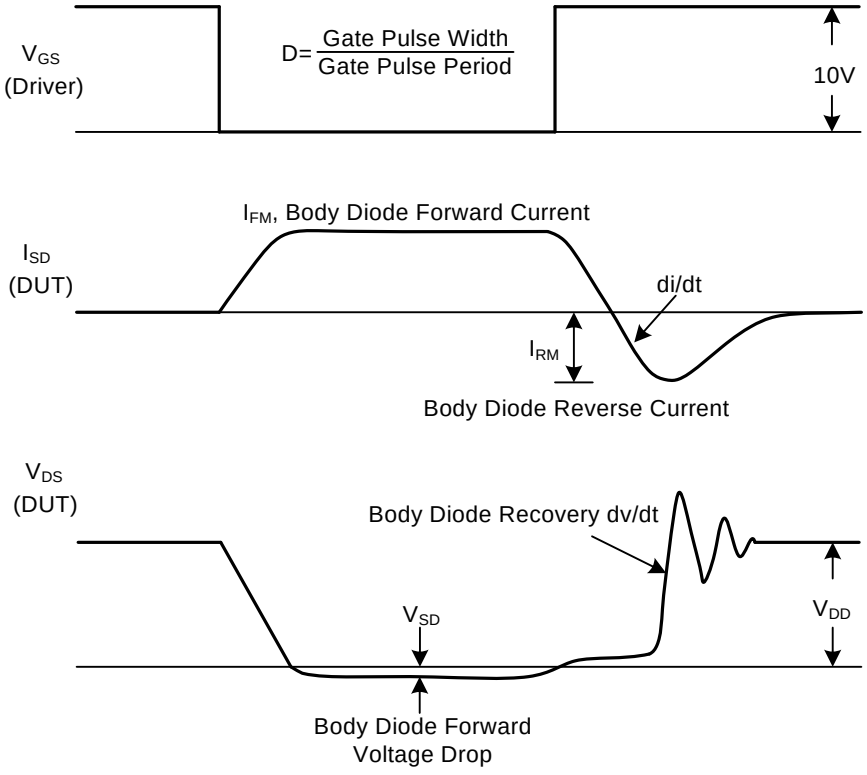
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	I_D=250μA, V_{GS}=0V	100			V
Drain-Source Leakage Current		I_{DSS}	V_{DS}=100V, V_{GS}=0V			1.0	μA
Gate-Source Leakage Current	Forward	I_{GSS}	V_{GS}=+20V, V_{DS}=0V			+100	nA
	Reverse		V_{GS}=-20V, V_{DS}=0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=250μA	1.0		2.2	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	V_{GS}=10V, I_D=3.0A		90	110	mΩ
			V_{GS}=4.5V, I_D=2.0A		120	140	mΩ
DYNAMIC PARAMETERS							
Input Capacitance		C_{ISS}	V_{GS}=0V, V_{DS}=25V, f=1.0MHz		780		pF
Output Capacitance		C_{OSS}			47		pF
Reverse Transfer Capacitance		C_{RSS}			36		pF
SWITCHING PARAMETERS							
Total Gate Charge (Note 1)		Q_G	V_{DS}=80V, V_{GS}=10V, I_D=15A, I_G=1mA (Note 1, 2)		25.8		nC
Gate to Source Charge		Q_{GS}			6.4		nC
Gate to Drain Charge		Q_{GD}			5.6		nC
Turn-on Delay Time (Note 1)		$t_{D(ON)}$	V_{DS}=50V, V_{GS}=10V, I_D=0.5A, R_G=25Ω (Note 1, 2)		11.4		ns
Rise Time		t_R			11		ns
Turn-off Delay Time		$t_{D(OFF)}$			103		ns
Fall-Time		t_F			29		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Maximum Body-Diode Continuous Current		I_S				15	A
Maximum Body-Diode Pulsed Current		I_{SM}				30	A
Drain-Source Diode Forward Voltage (Note 1)		V_{SD}	I_S=8.0A, V_{GS}=0V			1.4	V
Reverse Recovery Time (Note 1)		t_{rr}	I_S=15A, V_{GS}=0V, dI_F/dt =100A/μs		50		nS
Reverse Recovery Charge		Q_{rr}			84		nC

Notes: 1. Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating ambient temperature.

■ TEST CIRCUITS AND WAVEFORMS



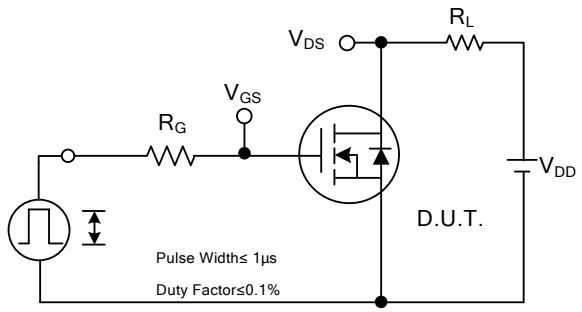
Peak Diode Recovery dv/dt Test Circuit



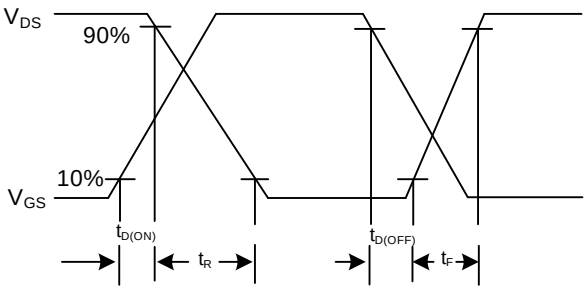
Peak Diode Recovery dv/dt Test Circuit and Waveforms

Peak Diode Recovery dv/dt Waveforms

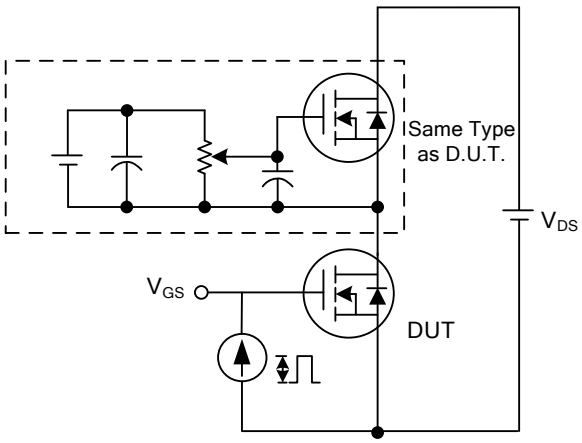
■ TEST CIRCUITS AND WAVEFORMS(Cont.)



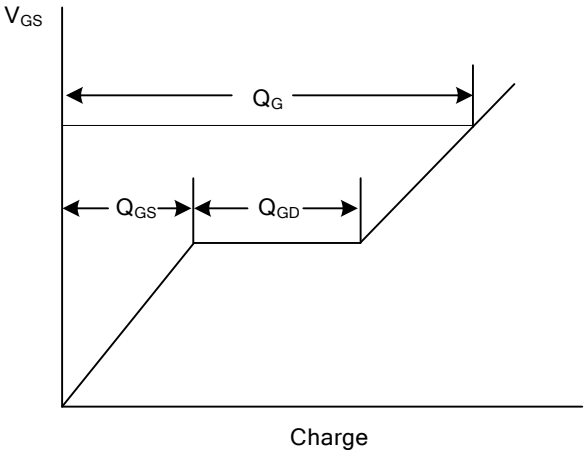
Switching Test Circuit



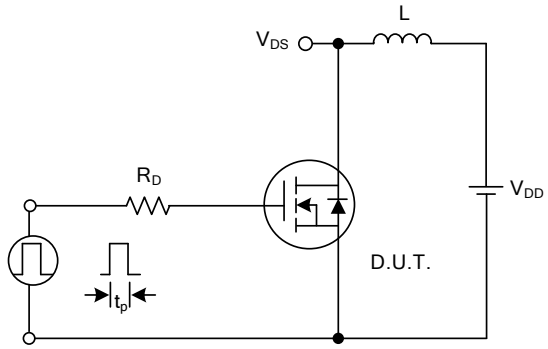
Switching Waveforms



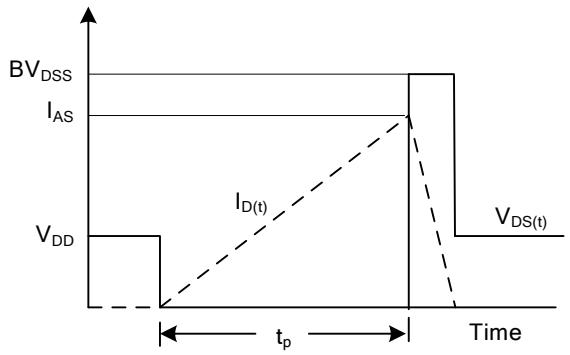
Gate Charge Test Circuit



Gate Charge Waveform

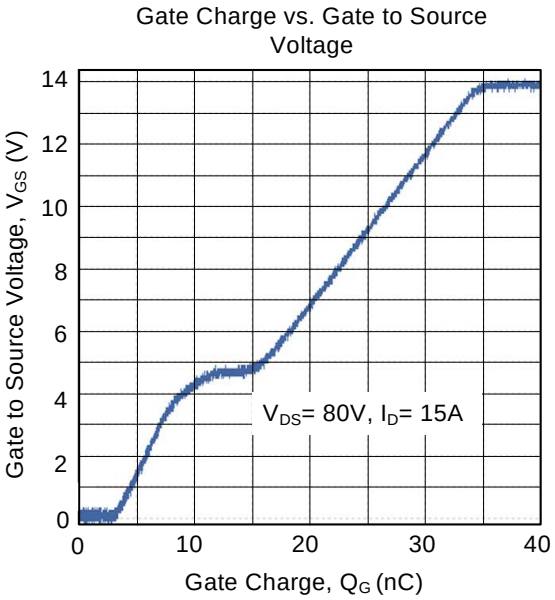


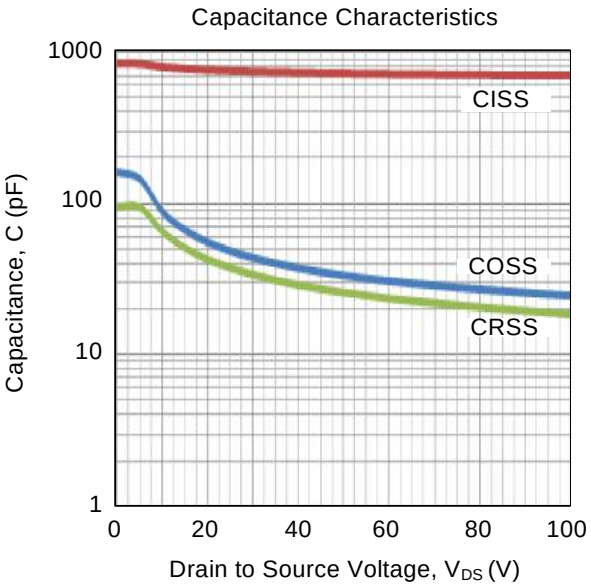
Unclamped Inductive Switching Test Circuit



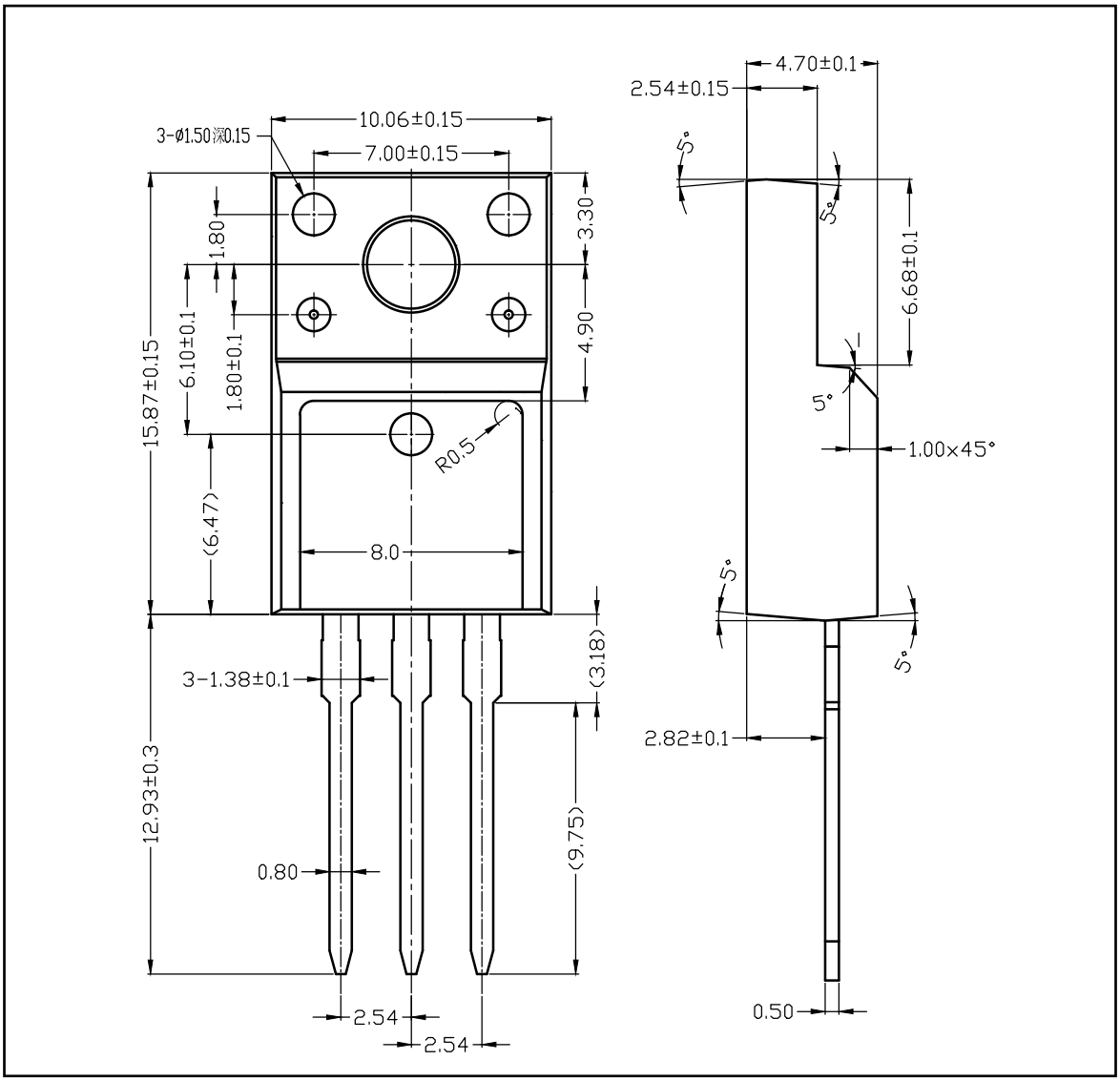
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS





■ TO-220F-3L PACKAGE OUTLINE DIMENSIONS



■ TO-220-3L PACKAGE OUTLINE DIMENSIONS