

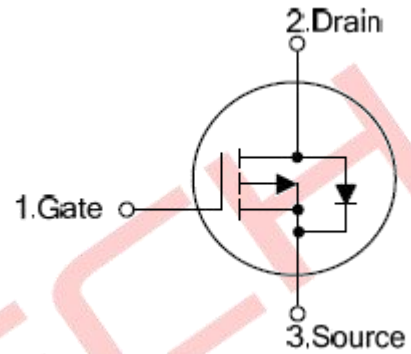
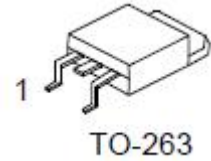
ATM06P50TC

P-Enhancement Mode Field Effect Transistor

Description

The ATM06P50TC is a P-channel power MOSFET using advanced technology to provide the customers with high switching speed and a minimum on-state resistance, and it can also withstand high energy in the avalanche.

This ATM06P50TC is suitable for load switch, etc.



Features

- High Switching Speed
- $R_{DS(ON)} < 15m\Omega$ @ $V_{GS} = -10V$, $I_D = -17A$

Absolute Maximum Ratings (Ta=25°C unless otherwise specified)

Parameter		Symbol	Maximum	Units	
Drain-Source Voltage		V _{DS}	-60	V	
Gate-Source Voltage		V _{GS}	±20	V	
Drain Current	Continuous(T _J =175°C)	T _c =25°C	-50(Note 5)	A	
		T _c =125°C	-27.5	A	
	Pulsed	I _{DM}	-80	A	
Avalanche Current		I _{AR}	-50	A	
Single Pulse Avalanche Energy(Note 2)		L=0.1mH	E _{AS}	125	mJ
Power Dissipation	T _c =25°C		PD	113(Note 4)	W
	T _A =25°C			2.5(Note 3,4)	W
Operating Junction and Storage Temperature Range		T _J ,T _{STG}	-55 ~ +150	°C	
Parameter		Symbol	Value	Unit	
Maximum Junction-to-Ambient		R _{θJA}	62.5	°C/W	
Maximum Junction-to-Case		R _{θJC}	1.1	°C/W	

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. Duty cycle ≤ 1%.

3. When Mounted on 1" square PCB (FR-4 material).

4. See SOA curve for voltage derating.

5. Package limited.

ATM06P50TC

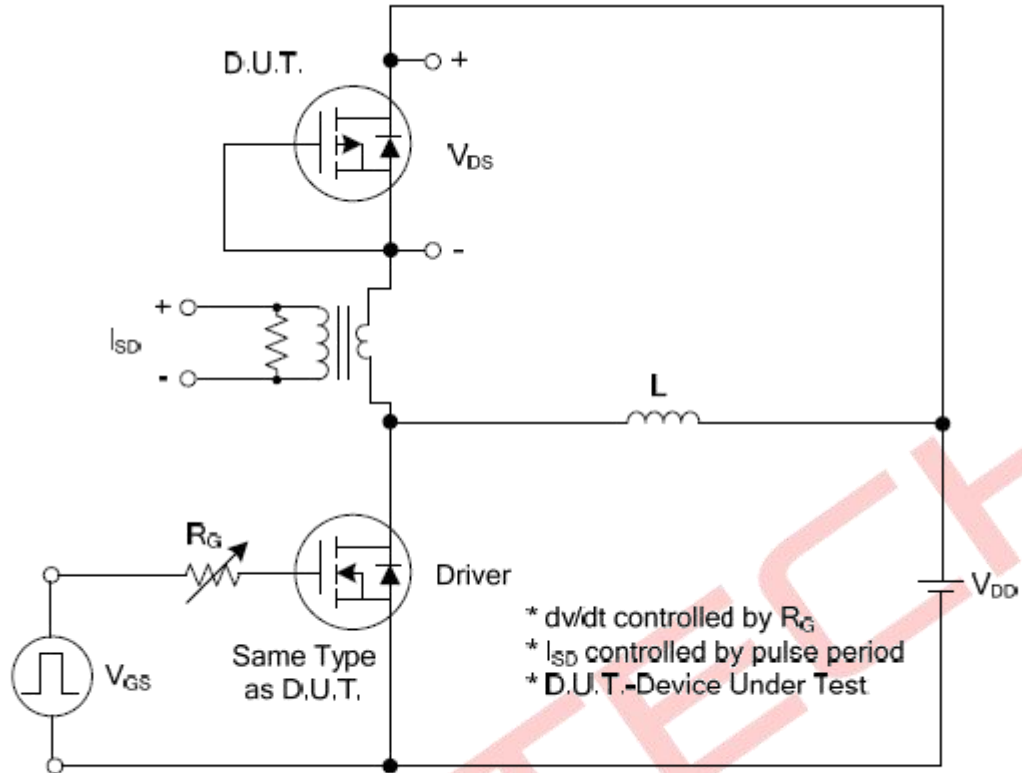
Electrical Characteristics (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Parameters						
Drain-Source breakdown voltage	BVDSS	ID=-250uA, VGS=0V	-60	-	-	V
Drain-Source Leakage current	IDSS	VDS=-60V, VGS=0V	-	-	-1	uA
Gate-Source leakage current	IGSS	VDS=0V, VGS=±20V	-	-	±100	nA
Gate Threshold voltage	VGS(th)	VGS=VDS, ID=-250uA	-1	-	-3	V
Static Drain-source on-resistance ¹	RDS(on)	VGS=-10V, ID=-17A	-	-	15	mΩ
		VGS=-4.5V, ID=-14A	-	-	20	mΩ
On State Drain Current ¹	ID(ON)	VGS=-10V, VDS=-5V	-50	-	-	A
Dynamic Parameters²						
Input Capacitance	Ciss	VGS=0V, VDS=-25V, f=1MHZ	-	5470	-	pF
Output capacitance	Coss		-	542	-	pF
Reverse transfer capacitance	Crss		-	346	-	pF
Switching Parameters^{2,3}						
Total Gate charge	Qg	VGS=-10V, VDS=-30V, ID=-50A	-	110	-	nC
Gate Source charge	Qgs		-	19	-	nC
Gate Drain charge	Qgd		-	28	-	nC
Turn-on delaytime	tD(on)	VDD=-30V, RL=0.6Ω, ID=-50A, VGE=-10V, RG=6Ω	-	19	-	ns
Turn-on rise time	tr		-	22	-	ns
Turn-off delaytime	tD(off)		-	120	-	ns
Turn-off fall time	tf	-	65	-	ns	
Source-Drain Diode characteristics²						
Maximum Body-Diode Continuous Current	Is		-	-	-50	A
Maximum Body-Diode Pulsed Current	ISM		-	-	-80	A
Body Diode Voltage	VSD	IF=-50A, VGS=0V	-	-	-1.6	V
Body Diode Reverse Recovery Time	trr	IF=-30A, dI/dt=100A/us	-	55	-	ns

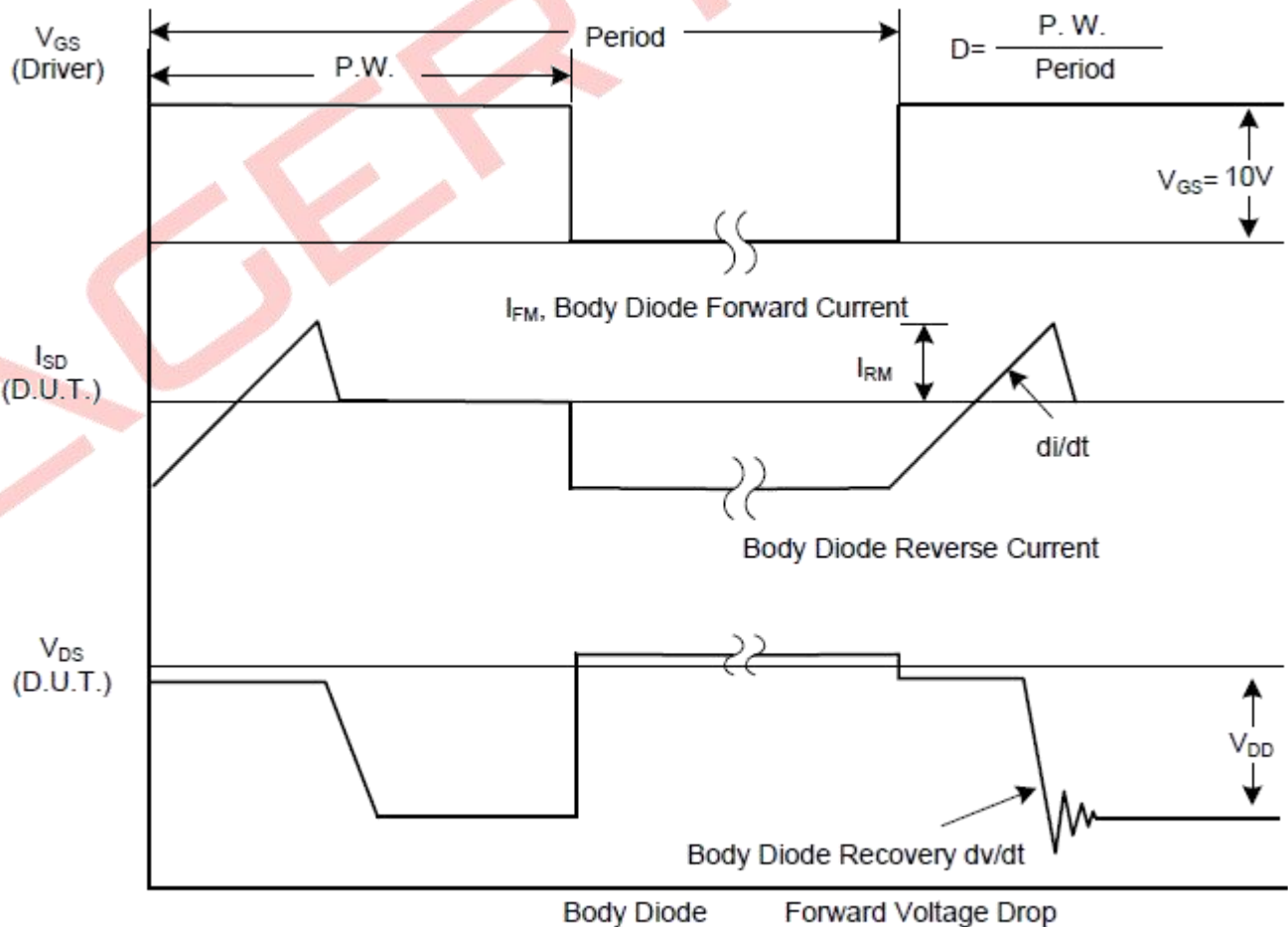
Notes:

1. Pulse test: pulse width ≤ 300uS, duty cycle ≤ 2%.
2. Guaranteed by design, not subject to production testing.
3. Independent of operating temperature.

Test Circuits And Waveforms

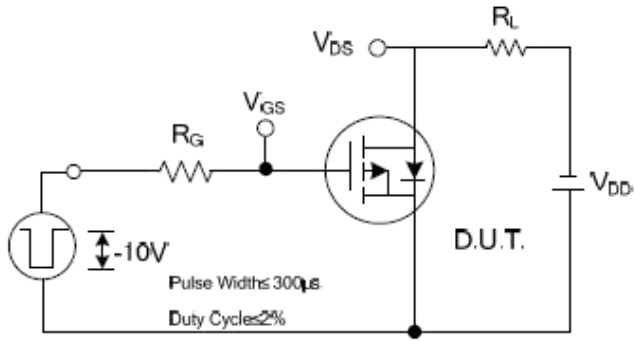


Peak Diode Recovery dv/dt Test Circuit

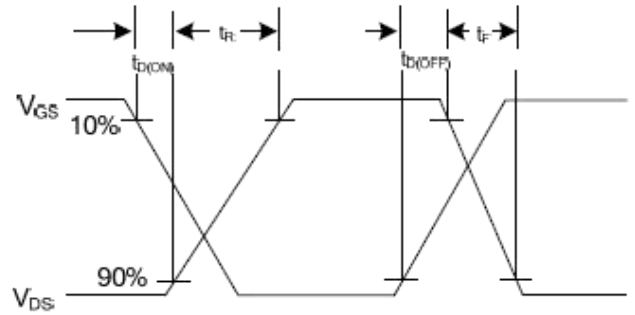


Peak Diode Recovery dv/dt Waveforms

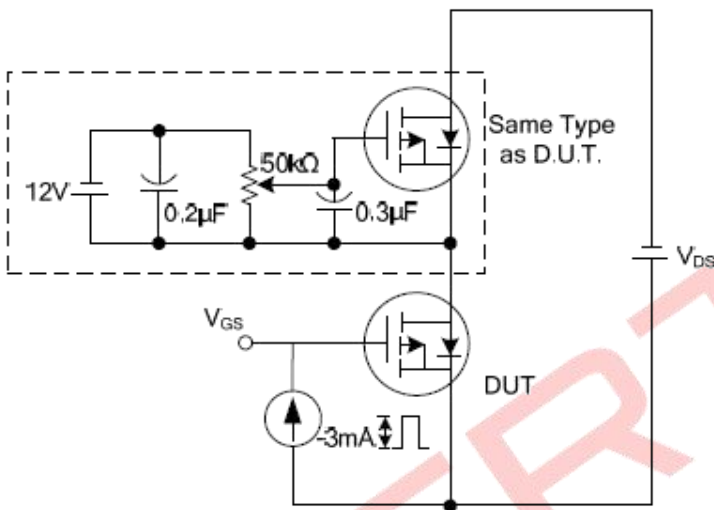
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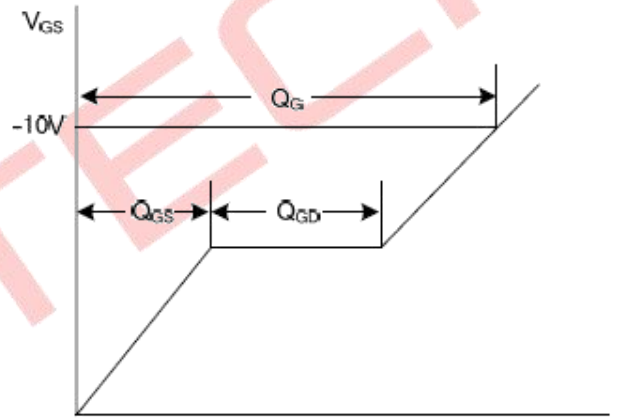
Switching Test Circuit



Switching Waveforms

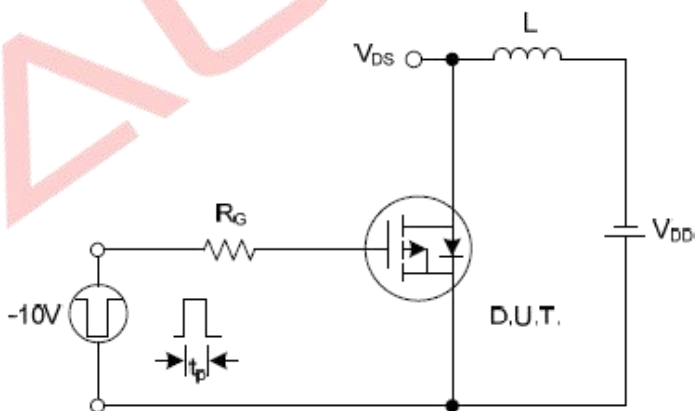


Gate Charge Test Circuit

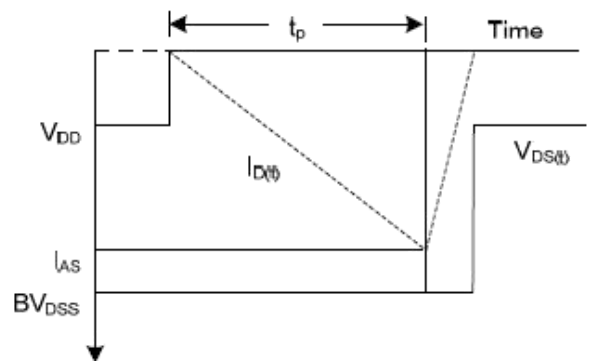


Charge

Gate Charge Waveform

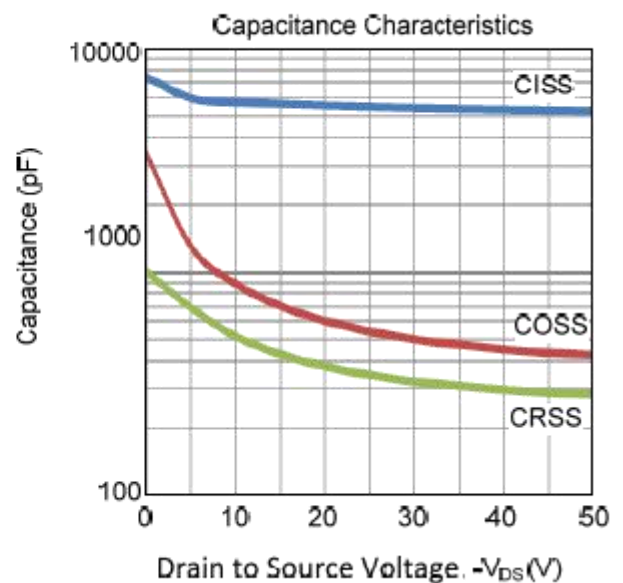
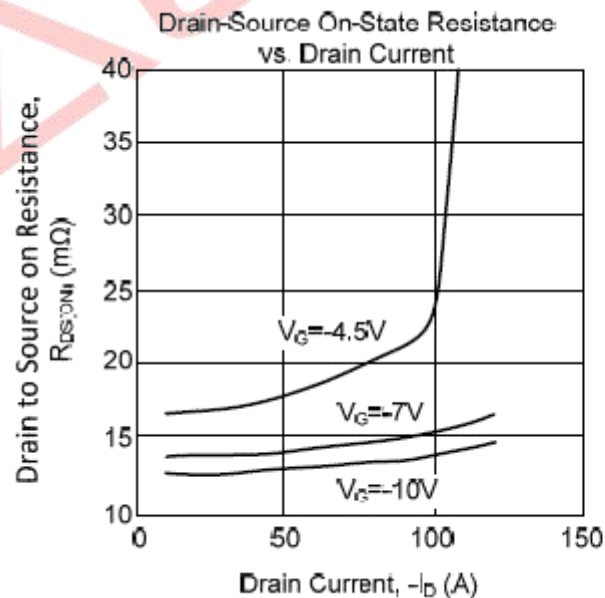
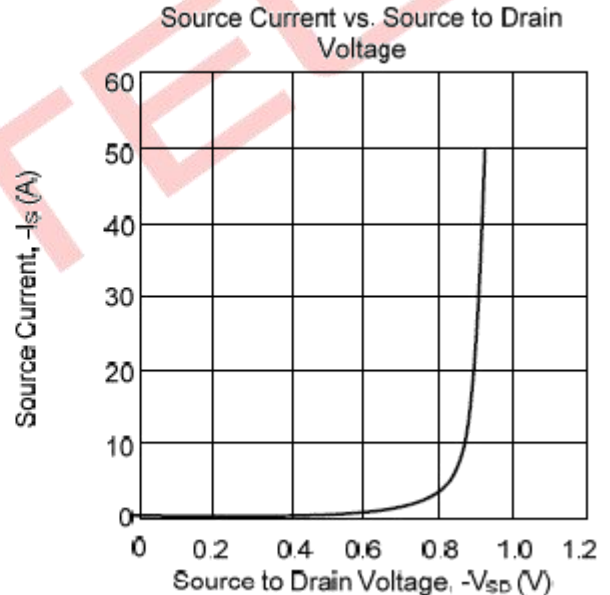
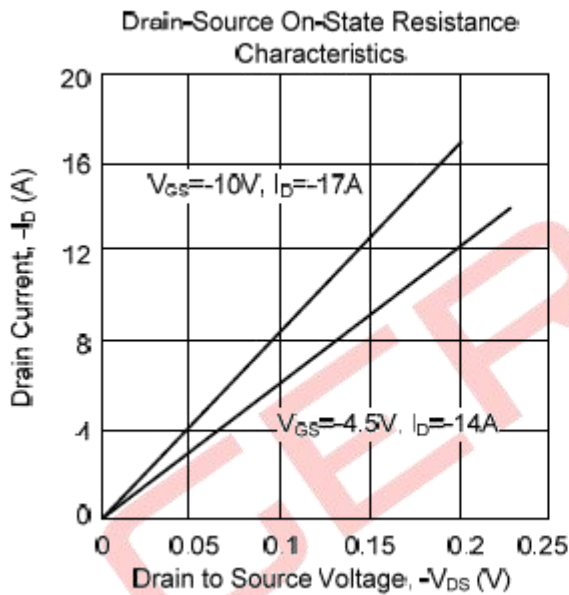
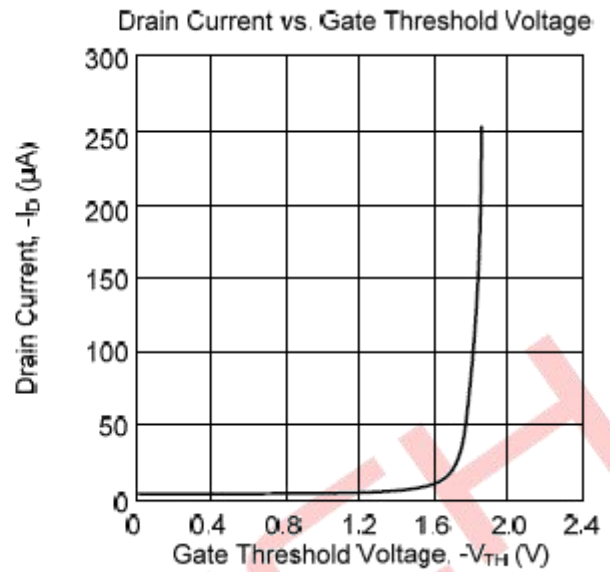
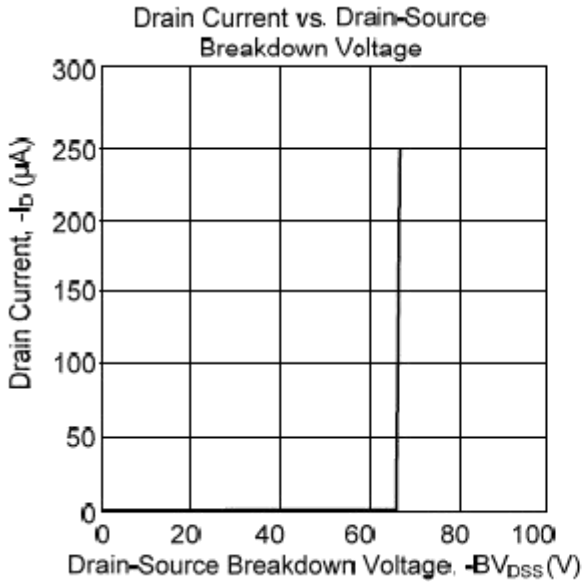


Unclamped Inductive Switching Test Circuit



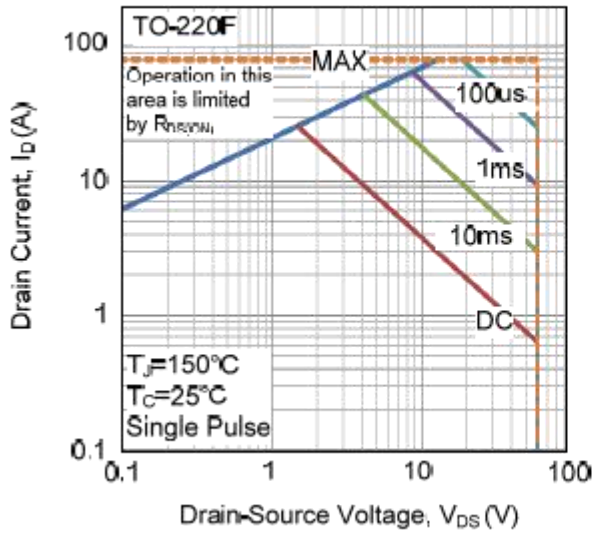
Unclamped Inductive Switching Waveforms

Typical Characteristics

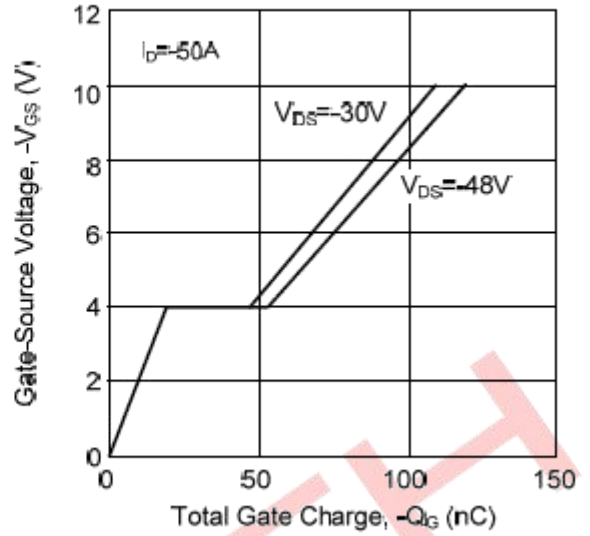


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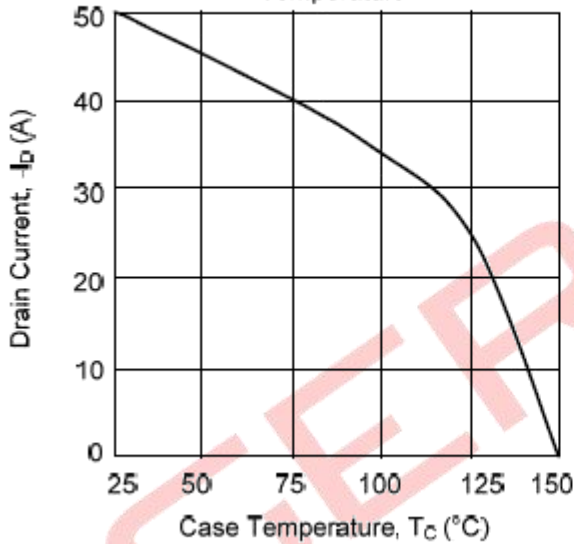
Safe Operating Area



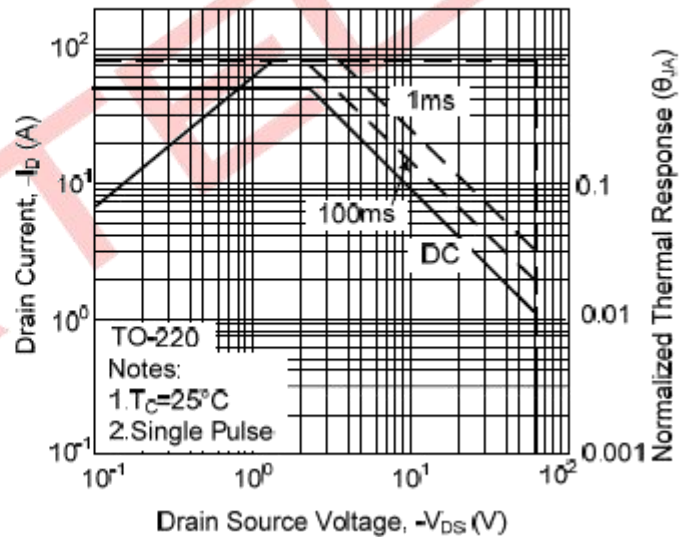
Gate Charge Characteristics



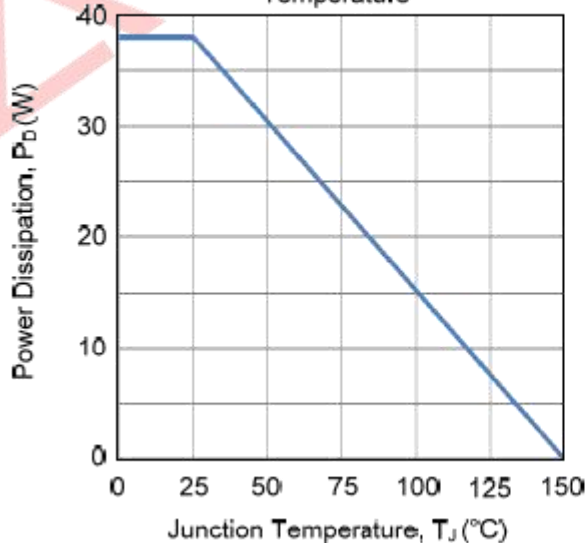
Maximum Drain Current vs. Case Temperature



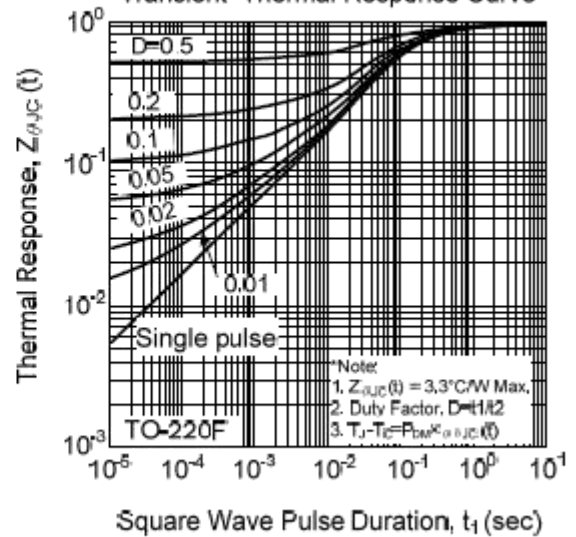
Maximum Safe Operating Area



Power Dissipation vs. Junction Temperature



Transient Thermal Response Curve



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