

Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
BV_{DSS}	Drain-Source Breakdown Voltage	-60	--	--	V	$V_{GS}=0V, I_D=-250\mu\text{A}$
$\Delta BV/\Delta T_J$	Breakdown Voltage Temp. Coeff.	--	-0.05	--	$V/^\circ\text{C}$	$I_D=-250\mu\text{A}$ See Fig 7
$V_{GS(th)}$	Gate Threshold Voltage	-2.0	--	-4.0	V	$V_{DS}=-5V, I_D=-250\mu\text{A}$
I_{GSS}	Gate-Source Leakage , Forward	--	--	-100	nA	$V_{GS}=-20V$
	Gate-Source Leakage , Reverse	--	--	100		$V_{GS}=20V$
I_{DSS}	Drain-to-Source Leakage Current	--	--	-10	μA	$V_{DS}=-60V$
		--	--	-100		$V_{DS}=-48V, T_C=150^\circ\text{C}$
$R_{DS(on)}$	Static Drain-Source On-State Resistance	--	--	0.14	Ω	$V_{GS}=-10V, I_D=-9A$ ④
g_{fs}	Forward Transconductance	--	8.8	--	S	$V_{DS}=-30V, I_D=-9A$ ④
C_{iss}	Input Capacitance	--	890	1155	pF	$V_{GS}=0V, V_{DS}=-25V, f=1\text{MHz}$ See Fig 5
C_{oss}	Output Capacitance	--	265	400		
C_{rss}	Reverse Transfer Capacitance	--	84	125		
$t_{d(on)}$	Turn-On Delay Time	--	14	40	ns	$V_{DD}=-30V, I_D=-18A,$ $R_G=12\Omega$ See Fig 13 ④⑤
t_r	Rise Time	--	24	60		
$t_{d(off)}$	Turn-Off Delay Time	--	43	95		
t_f	Fall Time	--	28	65		
Q_g	Total Gate Charge	--	30	38	nC	$V_{DS}=-48V, V_{GS}=-10V,$ $I_D=-18A$ See Fig 6 & Fig 12 ④⑤
Q_{gs}	Gate-Source Charge	--	5.3	--		
Q_{gd}	Gate-Drain("Miller") Charge	--	12	--		

Source-Drain Diode Ratings and Characteristics

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
I_S	Continuous Source Current	--	--	-18	A	Integral reverse pn-diode in the MOSFET
I_{SM}	Pulsed-Source Current ①	--	--	-72		
V_{SD}	Diode Forward Voltage ④	--	--	-3.9	V	$T_J=25^\circ\text{C}, I_S=-18A, V_{GS}=0V$
t_{rr}	Reverse Recovery Time	--	85	--	ns	$T_J=25^\circ\text{C}, I_F=-18A$
Q_{rr}	Reverse Recovery Charge	--	0.25	--	μC	$di_F/dt=100A/\mu\text{s}$ ④

Notes ;

- ① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature
- ② $L=2.0\text{mH}, I_{AS}=-18A, V_{DD}=-25V, R_G=27\Omega^*,$ Starting $T_J=25^\circ\text{C}$
- ③ $I_{SD} \leq -18A, di/dt \leq 300A/\mu\text{s}, V_{DD} \leq BV_{DSS},$ Starting $T_J=25^\circ\text{C}$
- ④ Pulse Test : Pulse Width = $250\mu\text{s},$ Duty Cycle $\leq 2\%$
- ⑤ Essentially Independent of Operating Temperature

Fig 1. Output Characteristics

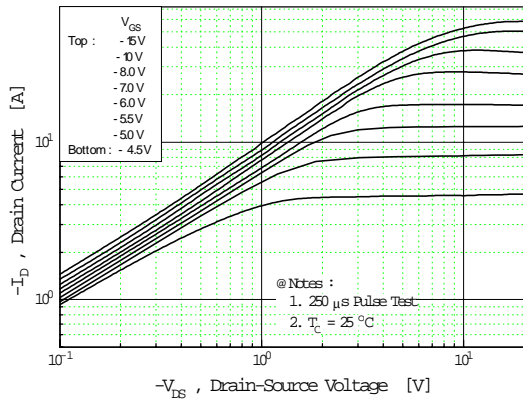


Fig 2. Transfer Characteristics

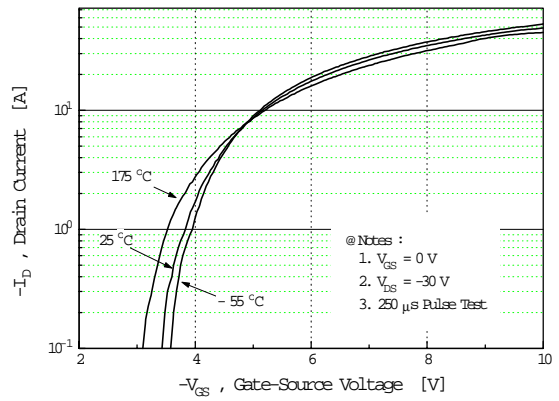


Fig 3. On-Resistance vs. Drain Current

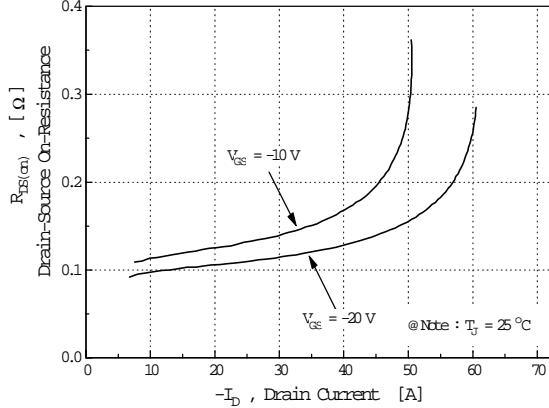


Fig 4. Source-Drain Diode Forward Voltage

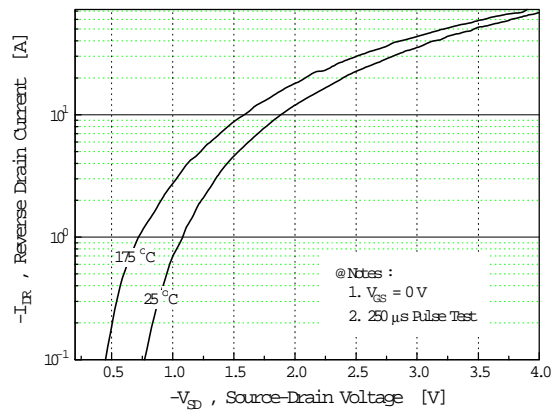


Fig 5. Capacitance vs. Drain-Source Voltage

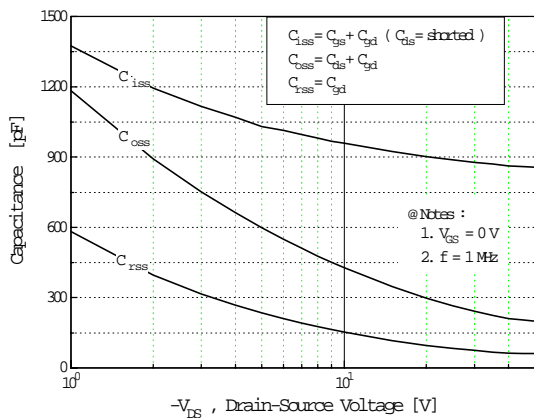


Fig 6. Gate Charge vs. Gate-Source Voltage

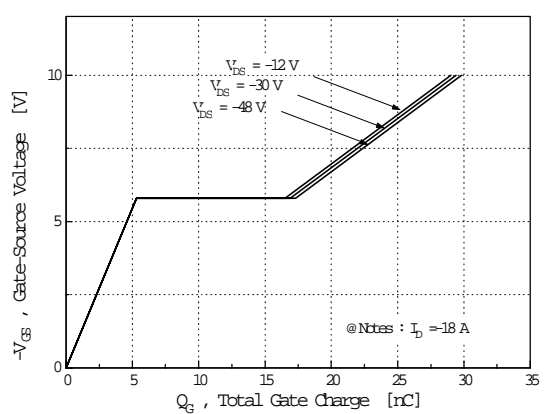


Fig 7. Breakdown Voltage vs. Temperature

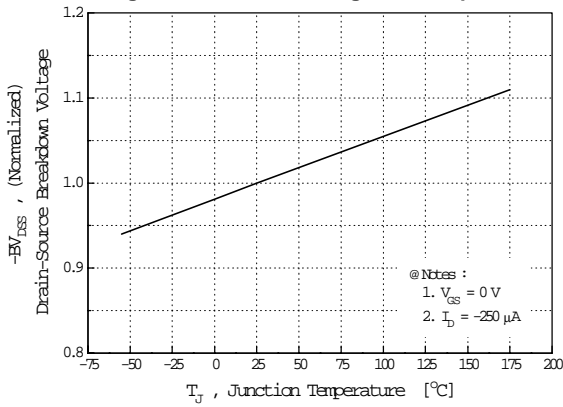


Fig 8. On-Resistance vs. Temperature

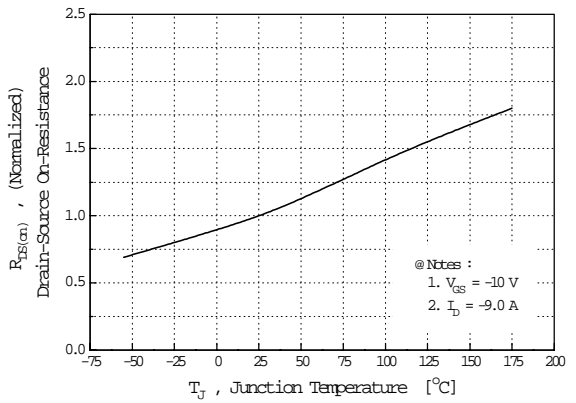


Fig 9. Max. Safe Operating Area

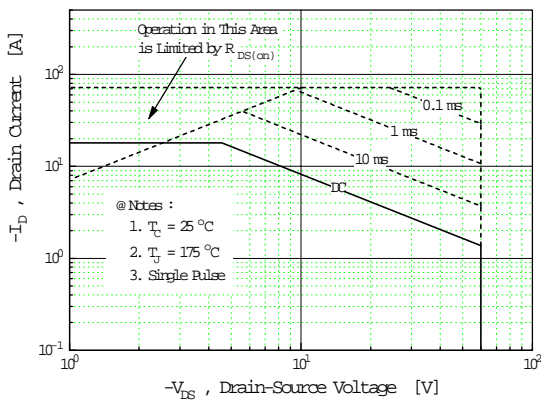


Fig 10. Max. Drain Current vs. Case Temperature

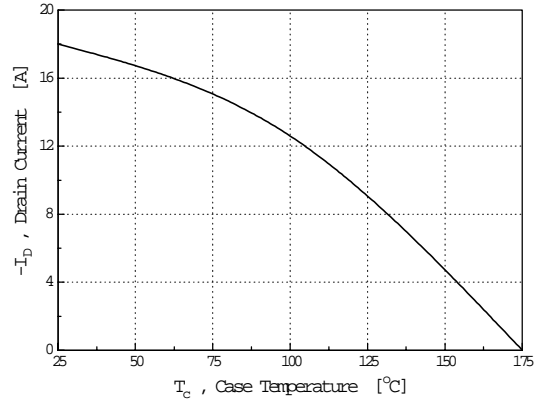


Fig 11. Thermal Response

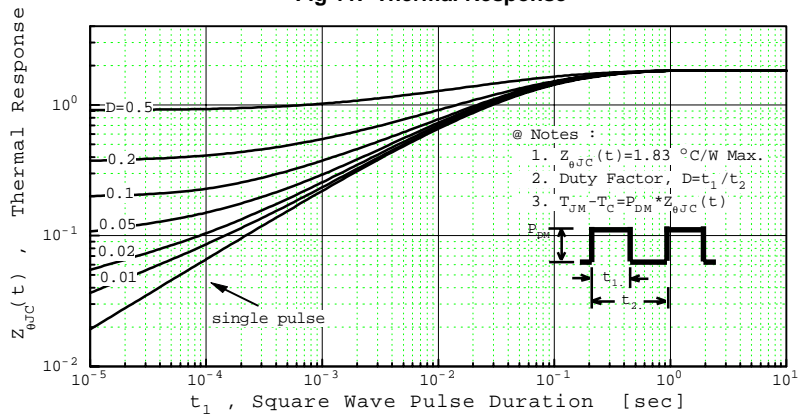


Fig 12. Gate Charge Test Circuit & Waveform

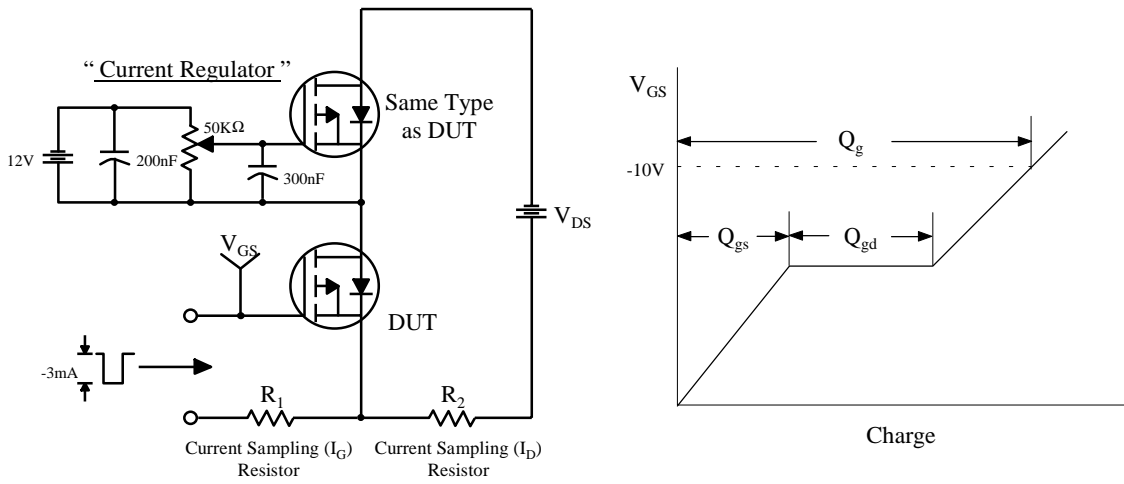


Fig 13. Resistive Switching Test Circuit & Waveforms

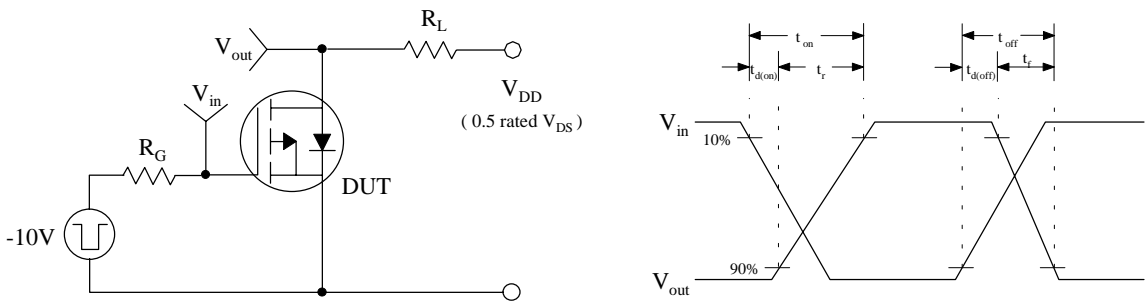
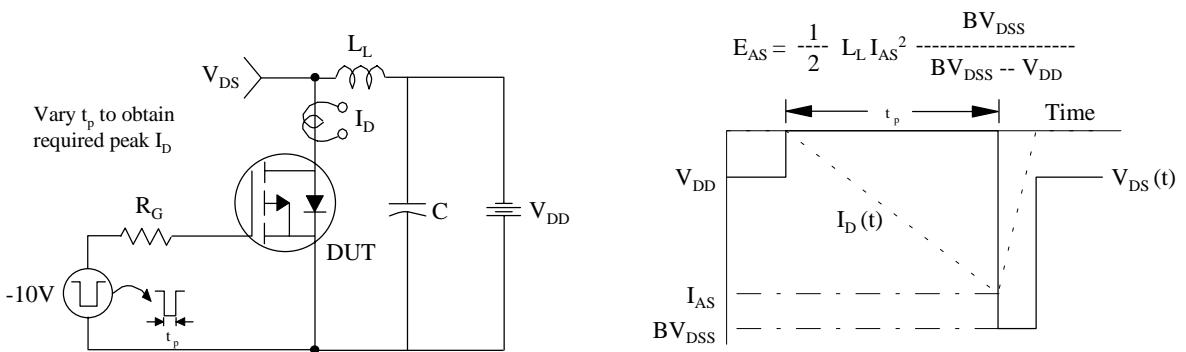


Fig 14. Unclamped Inductive Switching Test Circuit & Waveforms



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