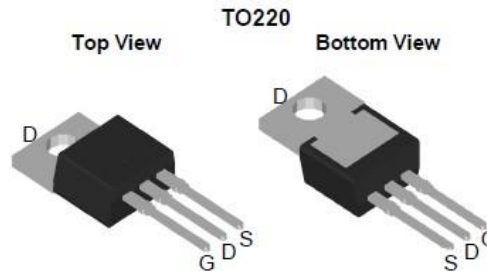
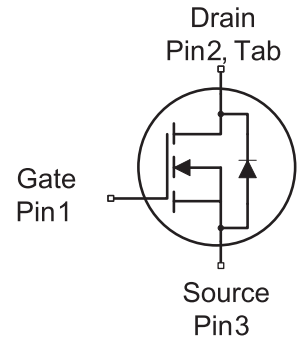


Features

- Uses advanced SGTtechnology
- Extremely low $R_{DS(on)}$, $t_{yp}=5.4m\Omega@V_{GS}=10V$
- Excellent gate charge x $R_{DS(on)}$ product(FOM)

Application

- Motor control and drives
- Battery management
- DC/DC converter
- General purpose applications



Product Summary

V_{DS}	85V
$R_{DS(on)}@V_{GS}=10V$	5.4m Ω
I_D	80A

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	85	V
Continuous drain current $T_C = 25^\circ C$ (Silicon limit) $T_C = 25^\circ C$ (Package limit) $T_C = 100^\circ C$ (Silicon limit)	I_D	100 80 60	A
Pulsed drain current $T_C = 25^\circ C$, t_p limited by T_{jmax}	I_{Dpulse}	480	
Avalanche energy, single pulse ($L=0.5mH, R_g=25\Omega$)	E_{AS}	620	mJ
Gate-emitter voltage	V_{GS}	± 20	V
Power dissipation $T_C = 25^\circ C$	P_{tot}	220	W
Operating junction and storage temperature	T_j, T_{stg}	-55~175	$^\circ C$

ThermalResistance

Parameter	Symbol	Value	Unit
Thermal resistance, junction – case.Max	R_{thJC}	0.70	°C/W
Thermal resistance, junction – ambient.Max	R_{thJA}	60	

Electrical Characteristic, at $T_j = 25\text{ }^\circ\text{C}$, unless otherwise specified

Parameter	Symbol	TestCondition	Value			Unit
			min.	typ.	max.	
StaticCharacteristic						
Drain-sourcebreakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	85	95	-	V
Gate thresholdvoltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$ $T_j=25^\circ\text{C}$ $T_j=125^\circ\text{C}$	2.0 -	3	4.0 -	
Zerogatevoltage draincurrent	I_{DSS}	$V_{DS}=85V, V_{GS}=0V$ $T_j=25^\circ\text{C}$ $T_j=125^\circ\text{C}$	- -	- 5	1 -	μA
Gate-source leakagecurrent	I_{GSS}	$V_{GS}=20V, V_{DS}=0V$	-	-	100	nA
Drain-sourceon-state resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=50A,$ $T_j=25^\circ\text{C}$	-	5.4	6.5	m Ω
Transconductance	g_{fs}	$V_{DS}=5V, I_D=50A$	-	80	-	S

DynamicCharacteristic

InputCapacitance	C_{iss}	$V_{GS}=0V, V_{DS}=40V,$ $f=1\text{MHz}$	-	4032	-	pF
OutputCapacitance	C_{oss}		-	637	-	
Reverse TransferCapacitance	C_{rssi}		-	17	-	
Gate TotalCharge	Q_G	$V_{GS}=10V, V_{DS}=40V,$ $I_D=25A, f=1\text{MHz}$	-	65.7	-	nC
Gate-Sourcecharge	Q_{gs}		-	24.9	-	
Gate-Draincharge	Q_{gd}		-	13.9	-	
Turn-on delaytime	$t_{d(on)}$	$T_j=25^\circ\text{C}, V_{GS}=10V,$ $V_{DS}=40V, R_L=3\Omega$	-	20.1	-	ns
Risetime	t_r		-	38	-	
Turn-off delaytime	$t_{d(off)}$		-	45.1	-	
Falltime	t_f		-	21	-	
Gate resistance	R_G	$V_{GS}=0V, V_{DS}=0V,$ $f=1\text{MHz}$	-	1.6	-	Ω

Body DiodeCharacteristic

Body Diode ForwardVoltage	V_{SD}	$V_{GS}=0V, I_{SD}=50A$	-	0.85	1.4	V
Body Diode ReverseRecovery Time	t_{rr}	$I_F=20A,$ $dI/dt=500A/\mu s$	-	61	-	ns
Body Diode ReverseRecovery Charge	Q_{rr}	$I_F=20A,$ $dI/dt=500A/\mu s$	-	340	-	nC

Typical Performance Characteristics

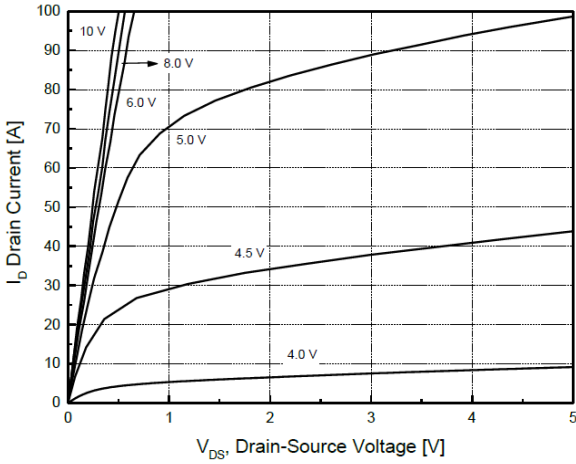


Figure 1. Typ. Output Characteristics ($T_j=25^\circ\text{C}$)

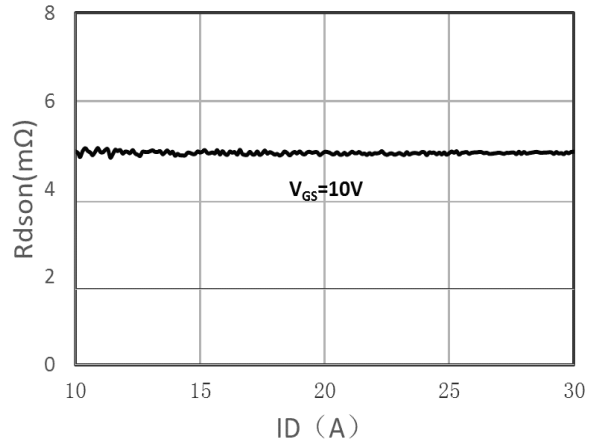


Figure 2. $R_{DS(on)}$ vs Drain Current and Gate Voltage

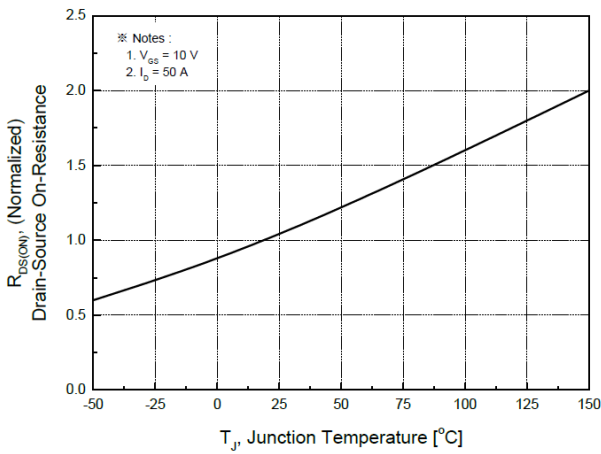


Figure 3. On-Resistance Variation with Temperature

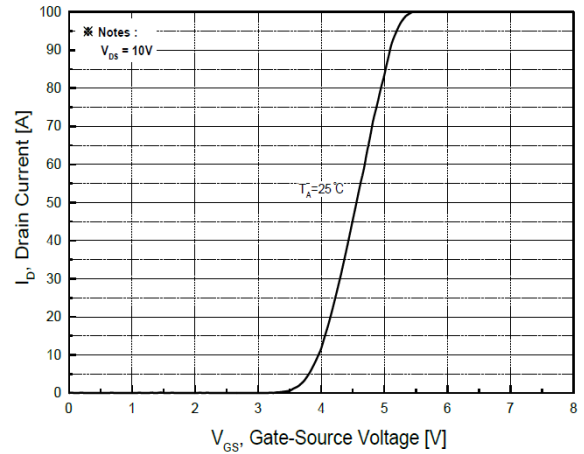


Figure 4. Transfer Characteristics

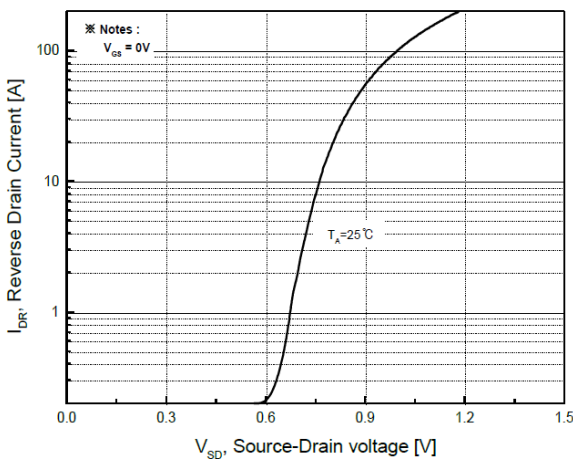


Figure 5. Body Diode Forward Voltage Variation with Source Current and Temperature

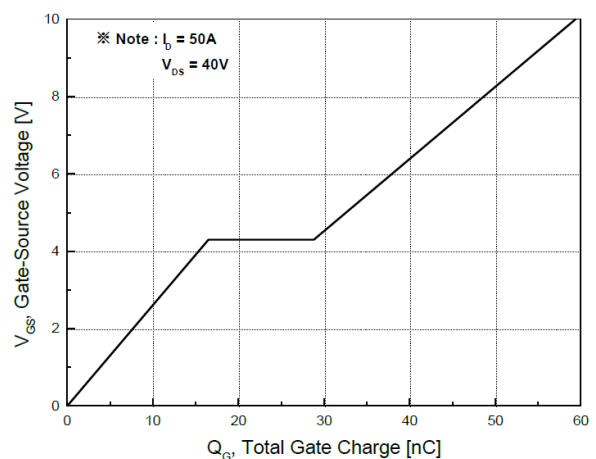


Figure 6 Gate Charge Characteristics

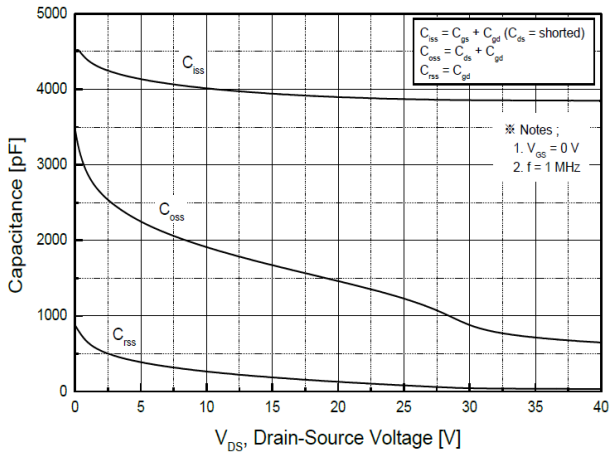


Figure 7. Capacitance Characteristics

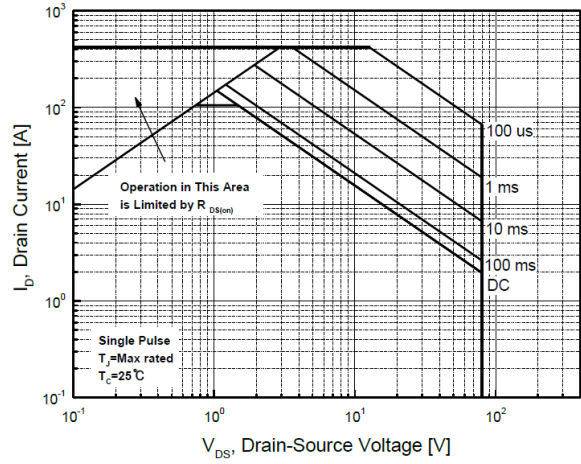


Figure 8. Maximum Safe Operating Area

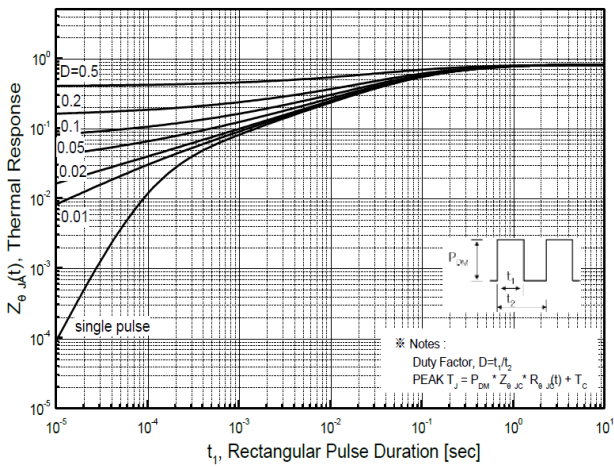
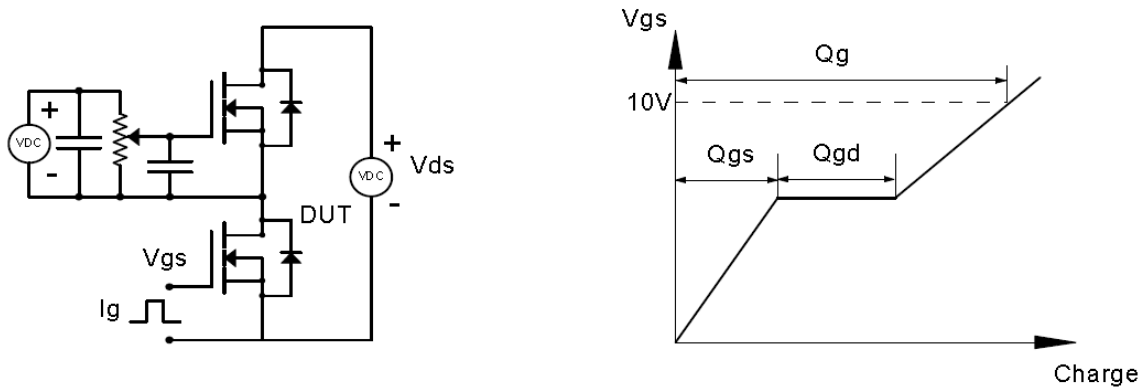


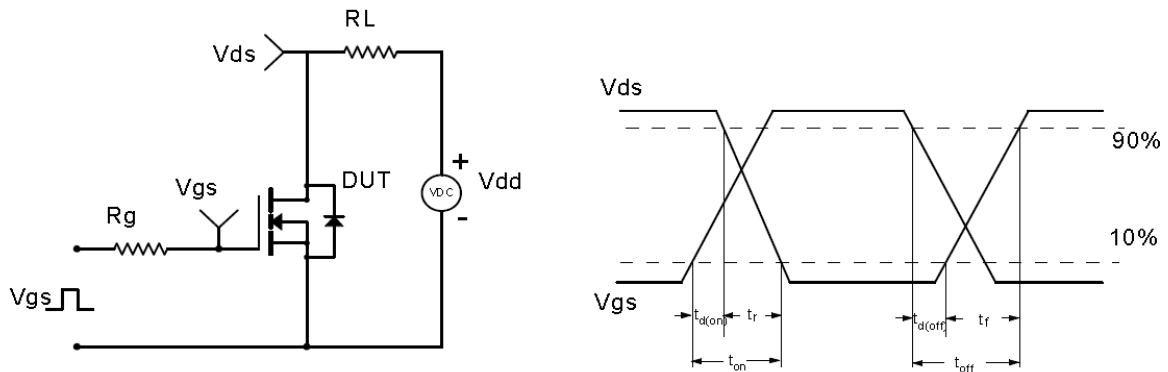
Figure 9: Transient Thermal Response Curve

Test Circuit & Waveform

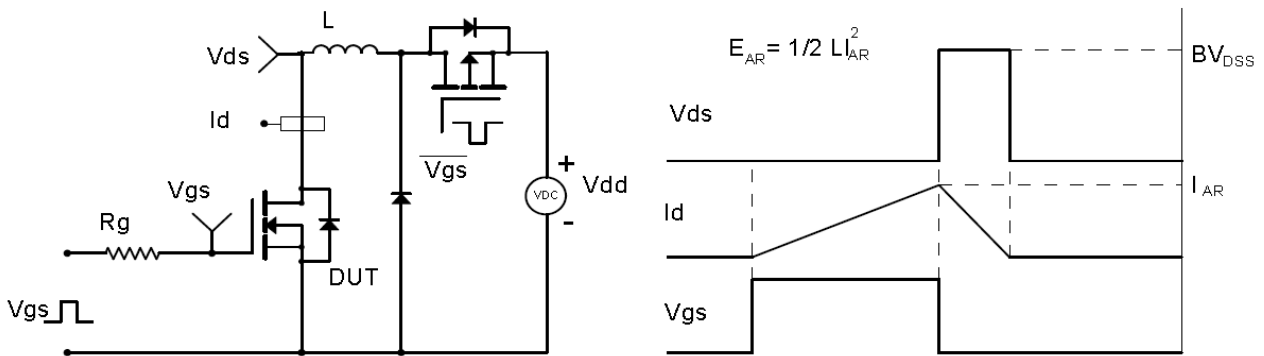
Gate Charge Test Circuit & Waveform



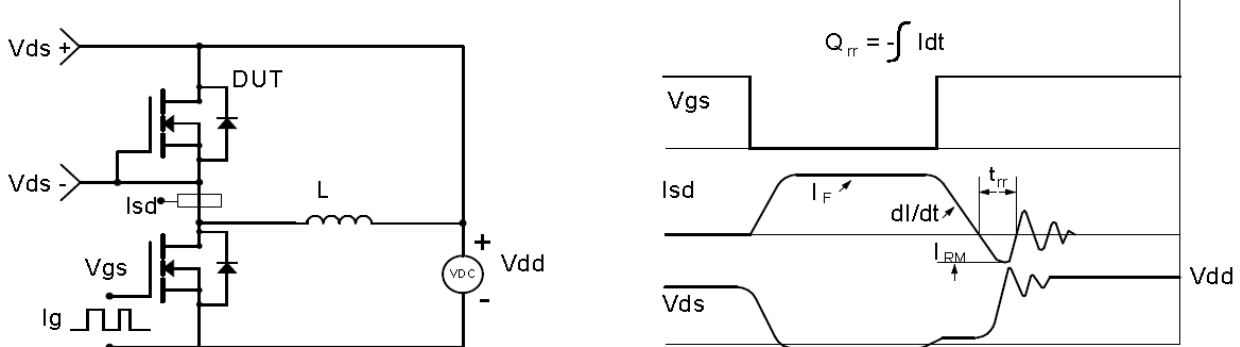
Resistive Switching Test Circuit & Waveforms



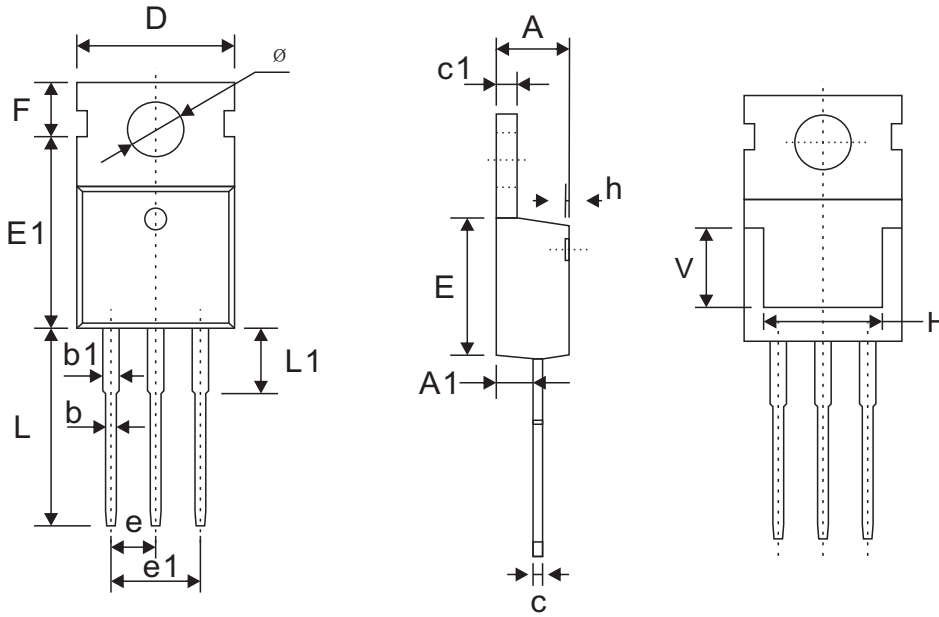
Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



Package Outline:TO-220-3L



Dimension	Millimeters	
	Min.	Max.
A	4.40	4.60
A1	2.25	2.55
b	0.71	0.91
b1	1.17	1.37
c	0.33	0.65
c1	1.20	1.40
D	9.91	10.25
E	8.95	9.75
E1	12.65	12.95
e	2.54 (Typ.)	
e1	4.98	5.18
F	2.65	2.95
H	7.90	8.10
h	0.00	0.30
L	12.90	13.40
L1	2.85	3.25
V	7.50 (Ref.)	
ø	3.40	3.80

Revision history

Date	Revision	Changes
28-May-2020	1.0	Initial release

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