N-Channel 100 V (D-S) MOSFET

PRODUCT SUMMARY

BV_{DSS}	100V
$R_{DSON(MAX.)}$	0.0115Ω
I_D	70A

FEATURES

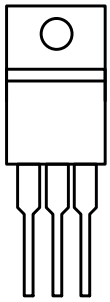
- SGT technology power supply Power MOSFET
- 100 % R_g and UIS Tested

RoHS COMPLIANT

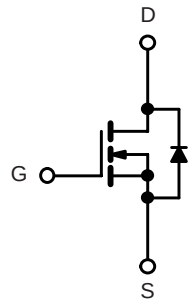
APPLICATIONS

- Battery protection
- Load switch
- Uninterruptible power supply

TO-220AB



G D S
Top View



N-Channel MOSFET

Absolute Maximum Ratings (T_C = 25 °C, unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current@10V	T_C = 25 °C	I_D	70	A
	T_C = 100 °C		45	
Pulsed Drain Current		I_{DM}	280	A
Single Pulse Avalanche Energy	L = 0.1 mH	E_{AS}	110	mJ
Total Power Dissipation	T_C = 25 °C	P_D	100	W
Operating Junction and Storage Temperature Range		T_J , T_{STG}	-55 to +150	°C

Thermal Characteristics

Parameter	Symbol	TYP.	MAX.	Unit
Thermal resistance, junction-to-ambient	$R_{\theta JA}$	-	64	°C / W
Thermal resistance, junction-to-case	$R_{\theta JC}$	-	1.25	

Electrical Characteristics T_J = 25°C, unless otherwise noted

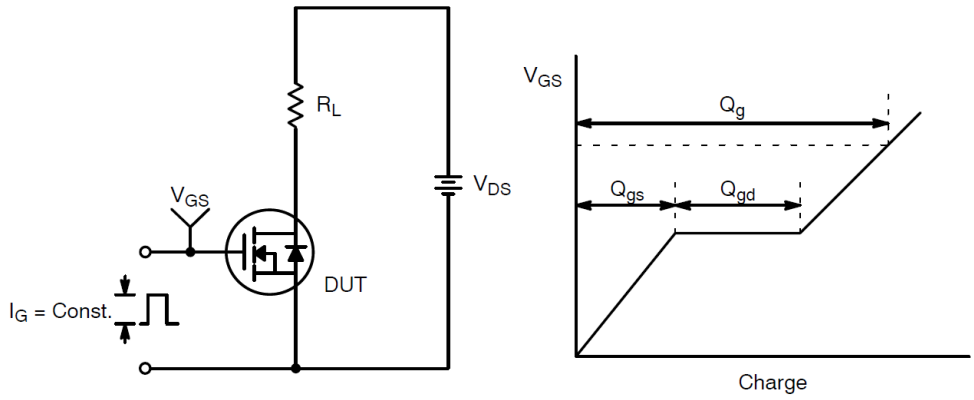
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V , I_D = 250 μA	100	-	-	V
Gate-body Leakage current	I_{GSS}	V_{DS} = 0 V , V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100 V , V_{GS} = 0 V , T_J = 25 °C	-	-	1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS} , I_D = 250 μA	1.2		2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10 V , I_D = 20 A	-	0.0095	0.0115	Ω
		V_{GS} = 4.5 V , I_D = 15 A	-	0.0105	0.013	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 50 V , V_{GS} = 0 V , f = 1 MHz	-	1370	-	pF
Output Capacitance	C_{oss}		-	453	-	
Reverse Transfer Capacitance	C_{rss}		-	13.1	-	
Switching Characteristics						
Gate Resistance	R_g	f = 1 MHz	-	0.48	-	Ω
Total Gate Charge	Q_g	V_{DS} = 50 V , V_{GS} = 10 V , I_D = 10 A	-	31.5	-	nC
Gate-Source Charge	Q_{gs}		-	3.51	-	
Gate-Drain Charge	Q_{gd}		-	7.65	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 50 V , I_D ≅ 50 A , V_{GEN} = 10 V , R_G = 4 Ω	-	18	-	nS
Rise Time	t_r		-	12	-	
Turn-Off Delay Time	$t_{d(off)}$		-	42	-	
Fall Time	t_f		-	8	-	
Drain-Source Body Diode Characteristics						
Diode Forward Voltage	V_{SD}	I_S = 10 A , V_{GS} = 0 V	-	-	1.2	V
Continuous Source-Dranin Diode Current	I_S	T_J = 25 °C	-	-	70	A
Reverse Recovery Charge	Q_{rr}	T_J = 25 °C , I_F = 10 A , dI/dt = 100 A/μs	-	189	-	nC
Reverse Recovery Time	t_{rr}		-	105	-	ns

Notes:

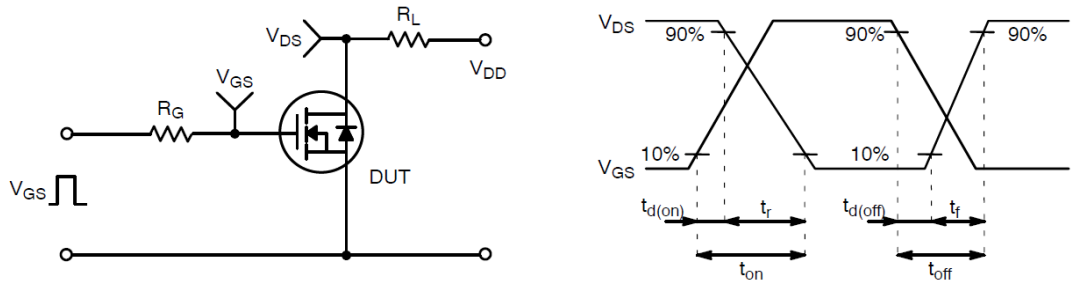
a. Repetitive rating; pulse width limited by maximum junction temperature

b. V_{DD}=50V, L=0.3mH, R_G=25Ω, Starting T_J=25 °C

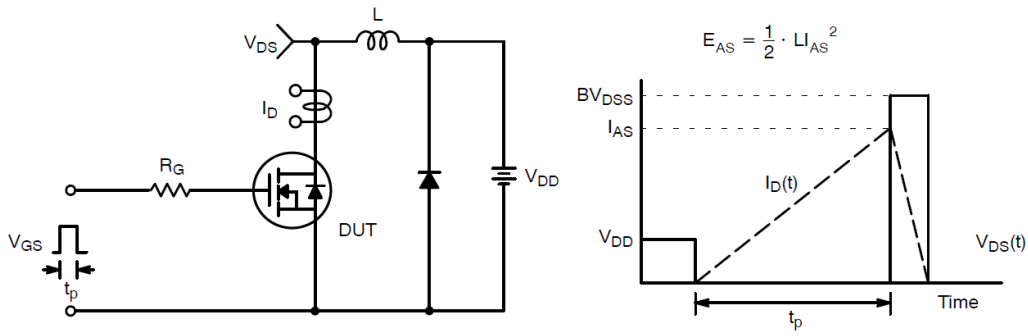
Test circuit and Waveform



Gate Charge Test Circuit & Waveform

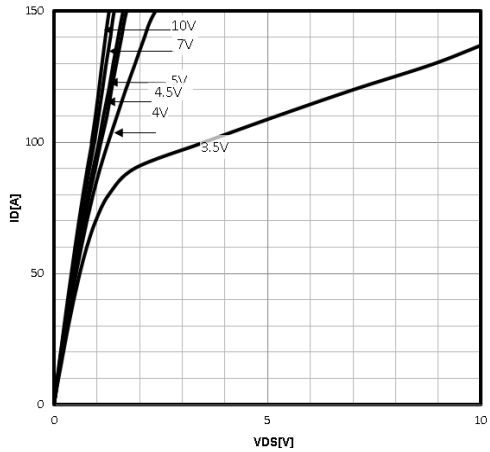


Resistive Switching Test Circuit & Waveforms



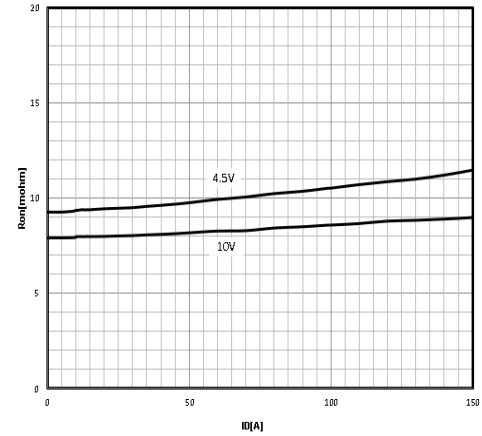
Unclamped Inductive Switching Test Circuit & Waveforms

TYPICAL CHARACTERISTICS (25 °C unless noted)



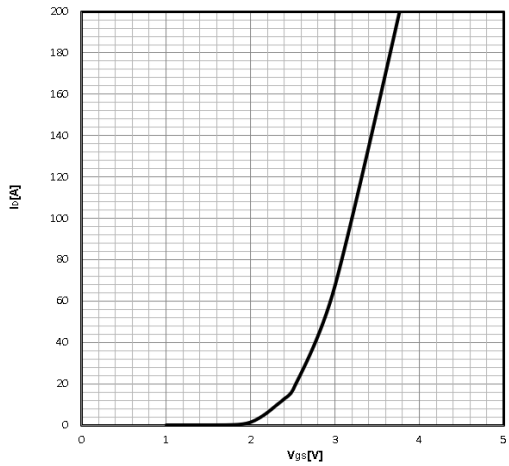
$I_D=f(V_{DS})$

Typ. output characteristics



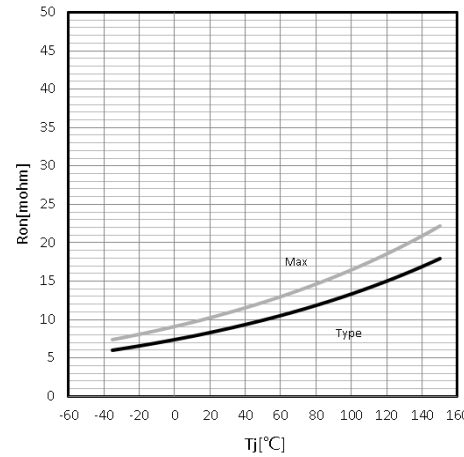
$R_{DS(on)}=f(I_D)$

Typ. drain-source on resistance



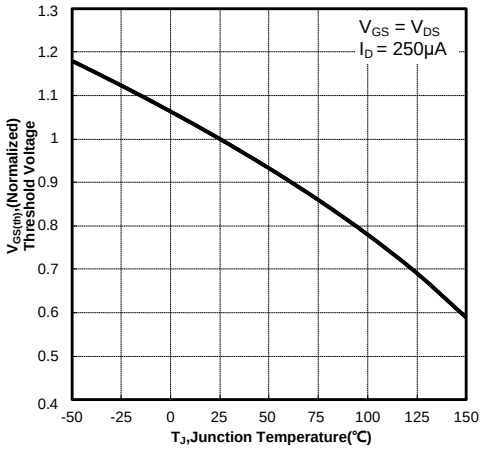
$I_D=f(V_{GS})$

Typ. transfer characteristics



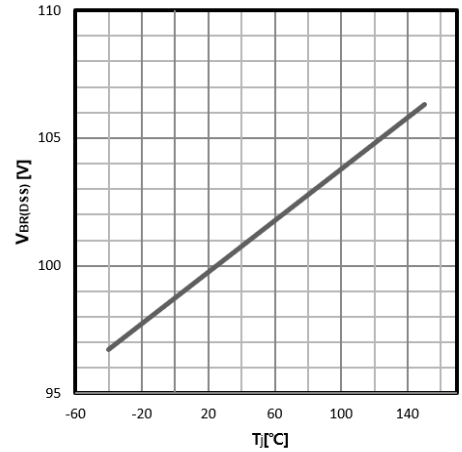
$R_{DS(on)}=f(T_J;I_D=20A;\ V_{GS}=10V$

Drain-source on-state resistance



$V_{TH}=f(T_J);\ I_D=250uA$

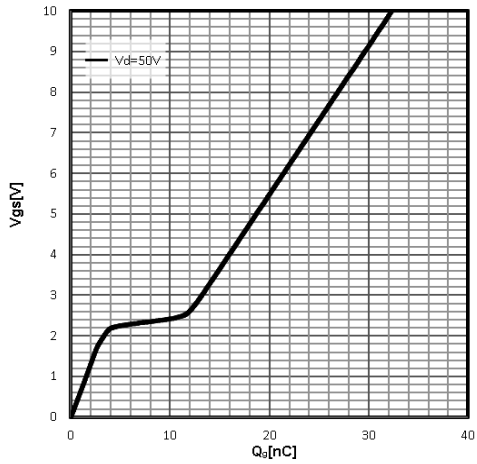
Gate Threshold Voltage



$V_{BR(DSS)}=f(T_J);\ I_D=250uA$

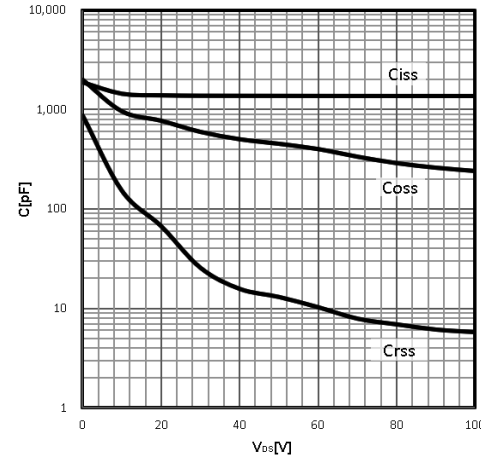
Drain-source breakdown voltage

TYPICAL CHARACTERISTICS (25 °C unless noted)



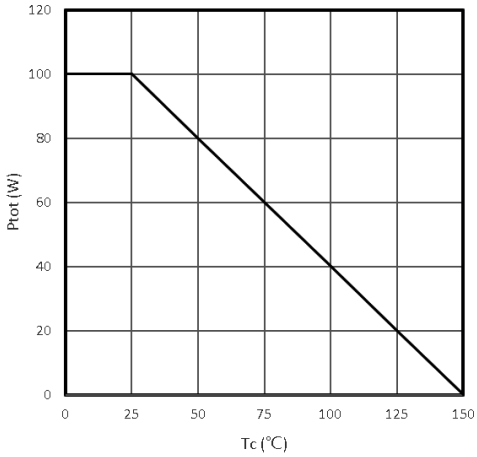
V_{GS}=f(Qg) ; I_D=10A

Typ. gate charge



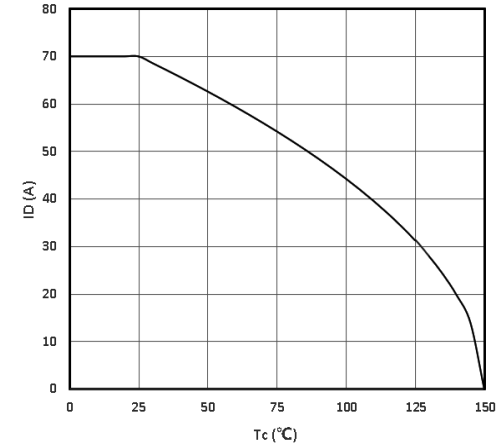
C =f(V_{DS}); V_{GS}=0V; f =1MHz

Typ. capacitances



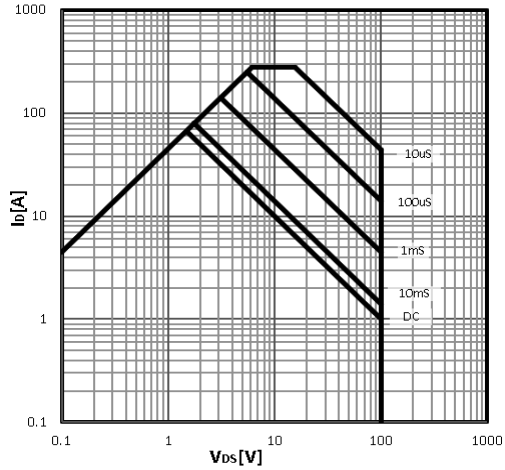
P_{tot}=f(T_C)

Power Dissipation



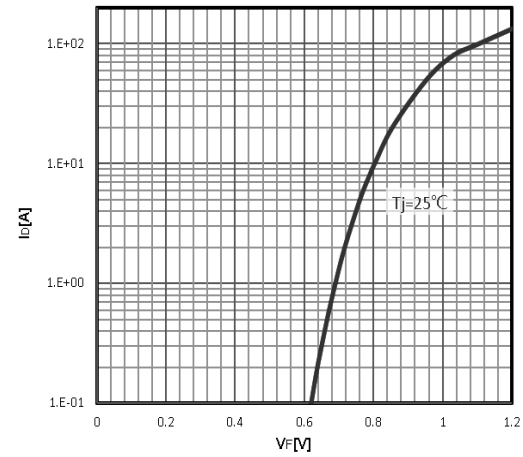
I_D=f(T_C)

Maximum Drain Current



I_D=f(V_{DS})

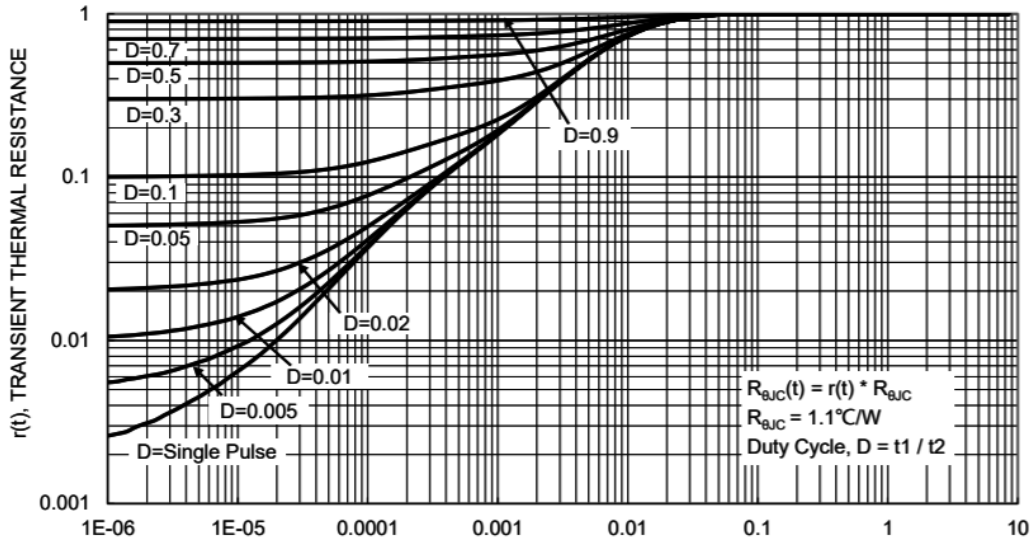
Safe operating area



I_F=f(V_{GS})

Body Diode Forward Voltage Variation

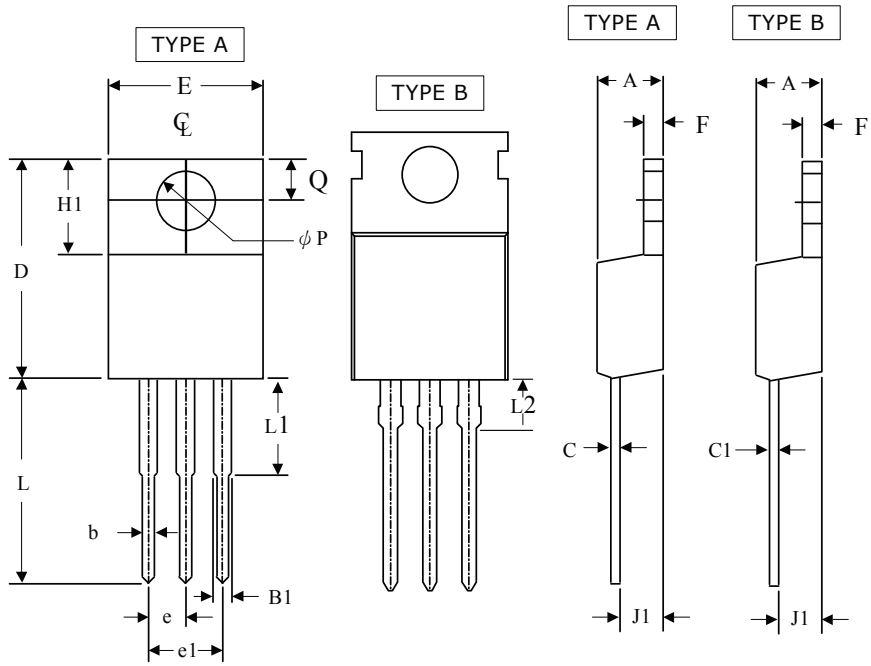
TYPICAL CHARACTERISTICS (25 °C unless noted)



$Z_{thJC}=f(t_p)$

Max. transient thermal impedance

TO-220 _ PACKGE OUTLIN



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.320	4.826	0.170	0.190
B1	1.143	1.778	0.045	0.070
b	0.610	0.910	0.024	0.036
c	0.356	0.530	0.014	0.021
c1	0.45	0.61	0.018	0.024
D	14.224	16.510	0.560	0.650
E	9.652	10.668	0.380	0.420
e	2.540 BSC		0.100 BSC	
e1	5.080 BSC		0.200 BSC	
F	1.220	1.397	0.048	0.055
H1	5.842	6.858	0.230	0.270
J1	2.032	2.921	0.080	0.115
L	12.700	14.732	0.500	0.580
L1	3.400	4.000	0.134	0.150
L2	2.70	3.20	0.106	0.126
ϕ P	3.530	4.090	0.139	0.161
Q	2.540	3.429	0.100	0.135