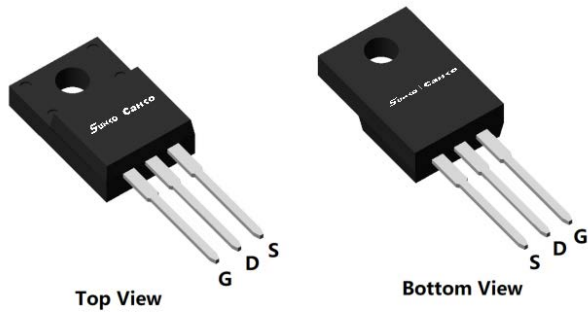
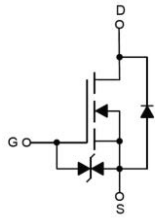


N-Channel Enhancement Mode Field Effect Transistor



ITO-220AB



Product Summary

- V_{DS} 800V
- I_D 19A
- $R_{DS(ON)}$ (at $V_{GS}=10V$) $<240m\Omega$
- 100% EAS Tested
- 100% ∇V_{DS} Tested

General Description

- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free

Applications

- Power switching application
- Uninterruptible power supply
- DC-DC convertor

Limiting Values

Parameter	Conditions		Symbol	Min	Max	Unit
Drain-source Voltage			V _{DS}	-	800	V
Gate-source Voltage			V _{GS}	-30	30	
Continuous Drain Current (Note 1,2)	Steady-State	T _A =25°C,V _{GS} =10V	I _D	-	1.69	A
		T _A =100°C,V _{GS} =10V		-	1.06	
Continuous Drain Current (Note 1,3)	Steady-State	T _C =25°C,V _{GS} =10V,Chip limitation		-	19	
		T _C =100°C,V _{GS} =10V		-	12	
Pulsed Drain Current	T _C =25 °C ,t _p ≤10μs		I _{DM}	-	45	
Maximum Body-Diode Continuous Current	T _C =25 °C		I _S		19	
Maximum Body-Diode Pulsed Current	T _C =25 °C ,t _p ≤10μs		I _{SM}	-	45	
Avalanche Energy (non-repetitive)	T _J =25°C,V _G =10V,R _G =25Ω,L=30mH,I _{AS} =4.3A		EAS	-	277.3	mJ
Total Power Dissipation (Note 1,2)	Steady-State	T _A =25°C	P _D	-	1.92	W
		T _A =100°C		-	0.76	
Total Power Dissipation (Note 1,3)	Steady-State	T _C =25°C		-	65	
		T _C =100°C		-	26	
MOSFET dv/dt Ruggedness	V _{DS} =0...400V,R _g =0Ω		dv/dt	-	47.6	V/ns
Reverse Diode dv/dt	V _{DS} =0...400V,I _D <=15A,di/dt=200A/us		dv/dt	-	16.6	
Maximum Diode Commutation Speed	V _{DS} =0...400V,I _D <=15A,R _g =0Ω		dif/dt	-	7660	A/us
Insulation withstand voltage	V _{rms} , t=60s		V _{ISO}	-	≥4000	V
Junction and Storage Temperature Range			T _J , T _{STG}	-55	150	°C

Thermal Resistance

Parameter		Symbol	Typ	Max	Units
Thermal Resistance Junction-to-Ambient (Note 2)	Steady-State	$R_{\theta JA}$	-	65	$^{\circ}C/W$
Thermal Resistance Junction-to-Case	Steady-State	$R_{\theta JC}$	-	1.9	

Ordering Information (Example)

PREFERRED P/N	PACKING CODE	Marking	MINIMUM PACKAGE(pcs)	INNER BOX QUANTITY(pcs)	OUTER CARTON QUANTITY(pcs)	DELIVERY MODE
SCF210C80BZJ	B1	SCF210C80B	50	/	5000	Tube

■ Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA, T _j =25℃	800	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =800V, V _{GS} =0V, T _j =25℃	-	-	1	μA
		V _{DS} =800V, V _{GS} =0V, T _j =150℃	-	-	100	
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±30V, V _{DS} =0V, T _j =25℃	-	-	±10	μA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA, T _j =25℃	2.2	3	3.8	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =8.5A, T _j =25℃	-	190	240	mΩ
		V _{GS} =10V, I _D =8.5A, T _j =150℃	-	530	670	
Diode Forward Voltage	V _{SD}	I _S =19A, V _{GS} =0V, T _j =25℃	-	0.86	1.2	V
Gate Resistance	R _G	f=1MHz, T _j =25℃	-	2.9	-	Ω
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{DS} =400V, V _{GS} =0V, f=1MHz, T _j =25℃	-	2200	-	pF
Output Capacitance	C _{oss}		-	43	-	
Reverse Transfer Capacitance	C _{rss}		-	1.9	-	
Effective Output capacitance, Energy Related	C _{o(er)}	V _{DS} =0...400V, V _{GS} =0V, f=1MHz, T _j =25℃	-	58	-	
Effective Output Capacitance, Time Related	C _{o(tr)}		-	265	-	
Switching Parameters						
Total Gate Charge	Q _g	V _{GS} =10V, V _{DS} =400V, I _D =16A, T _j =25℃	-	48.6	-	nC
Gate-Source Charge	Q _{gs}		-	10	-	
Gate-Drain Charge	Q _{gd}		-	17.5	-	
Reverse Recovery Charge	Q _{rr}	I _F =16A, di/dt=100A/μs, V _{GS} =0V, V _R =400V, T _j =25℃	-	5713	-	nC
Reverse Recovery Time	t _{rr}		-	340	-	ns
Peak Reverse Recovery Current	I _{rrm}		-	28.5	-	A
Turn-on Delay Time	t _{D(on)}	V _{GS} =10V, V _{DS} =400V, I _D =16A, R _{GEN} =3Ω, T _j =25℃	-	38.6	-	ns
Turn-on Rise Time	t _r		-	20.6	-	
Turn-off Delay Time	t _{D(off)}		-	43.3	-	
Turn-off Fall Time	t _f		-	13.2	-	

Note:

- The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
- The value of $R_{\theta JA}$ is measured with the device mounted on the 40mm*40mm*1.1mm single layer FR-4 PCB board with 1 in² pad of 2oz. Copper, in the still air environment with $T_A=25^\circ C$. The maximum allowed junction temperature of $150^\circ C$. The value in any given application depends on the user's specific board design.
- Thermal resistance from junction to soldering point (on the exposed drain pad).

■ Typical Electrical and Thermal Characteristics Diagrams

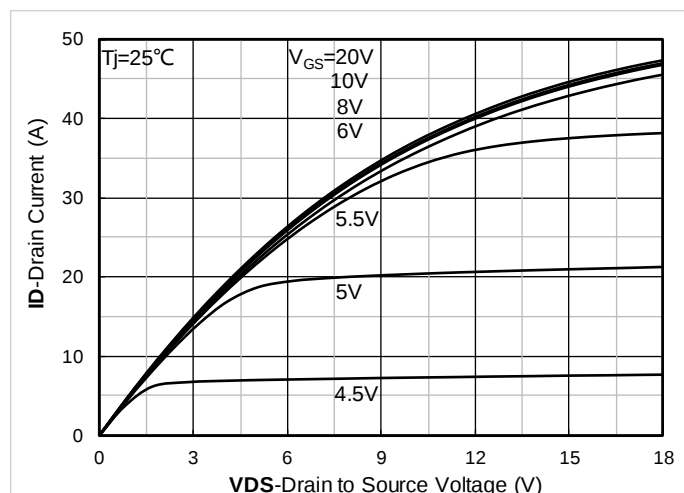


Figure 1. Output Characteristics; typical values

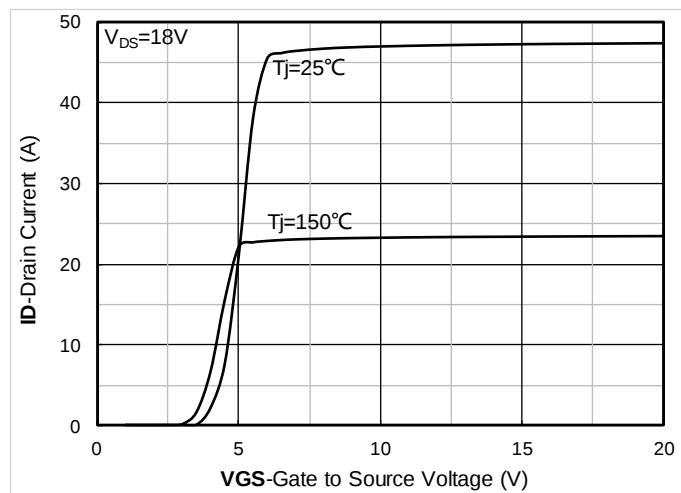


Figure 2. Transfer Characteristics; typical values

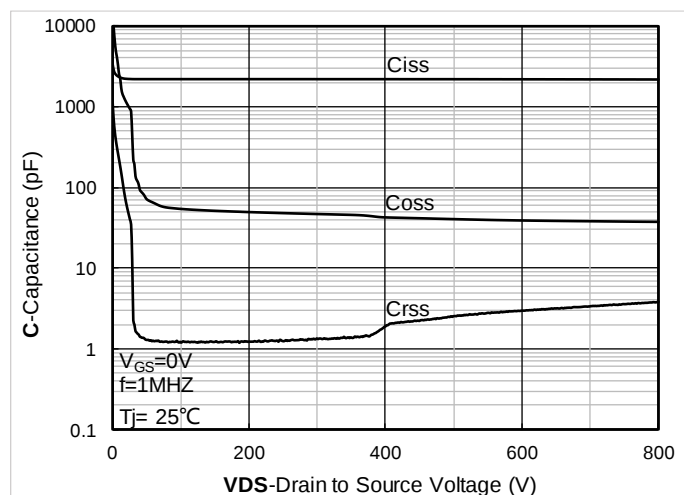


Figure 3. Capacitance Characteristics; typical values

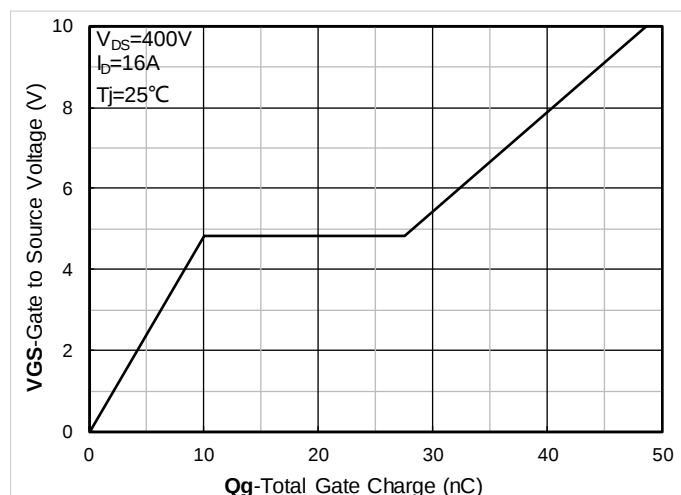


Figure 4. Gate Charge; typical values

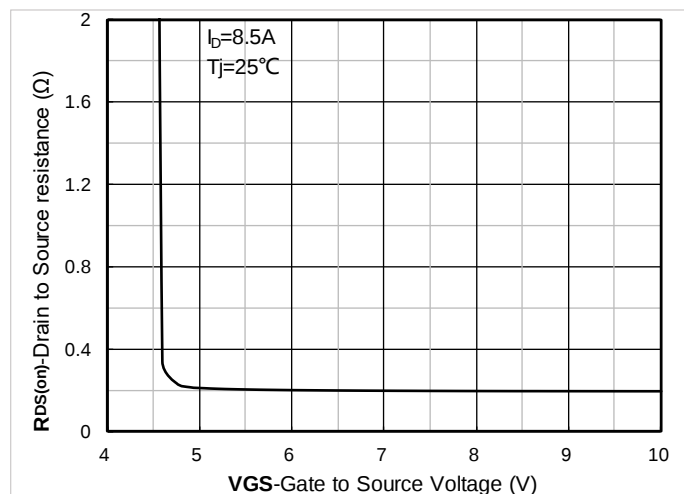


Figure 5. On-Resistance vs. Gate to Source Voltage; typical values

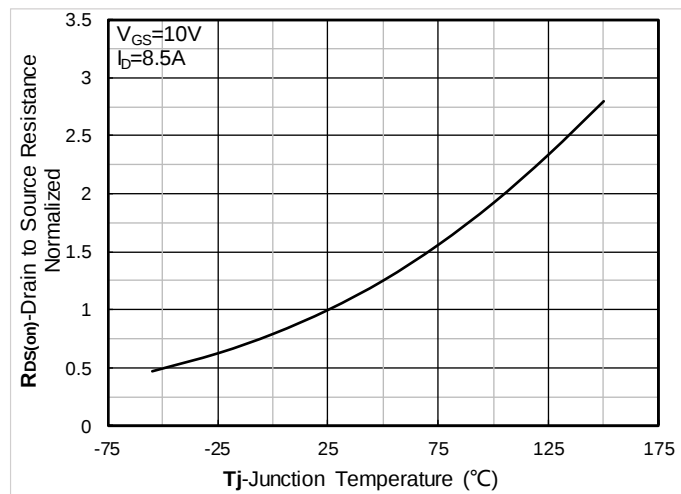


Figure 6. Normalized On-Resistance

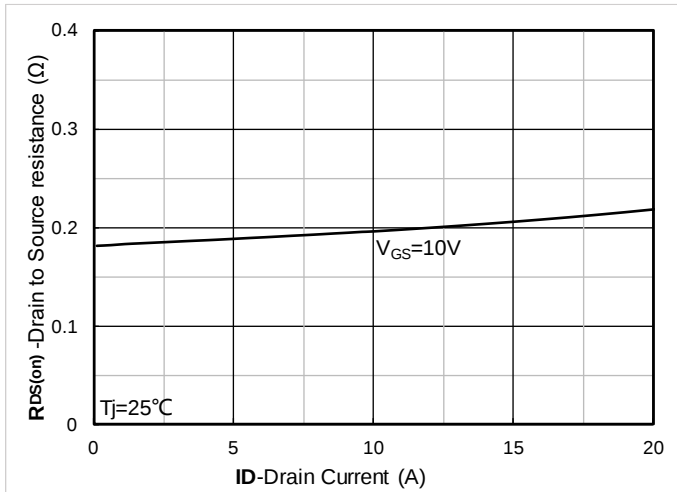


Figure 7. RDS(on) vs. Drain Current; typical values

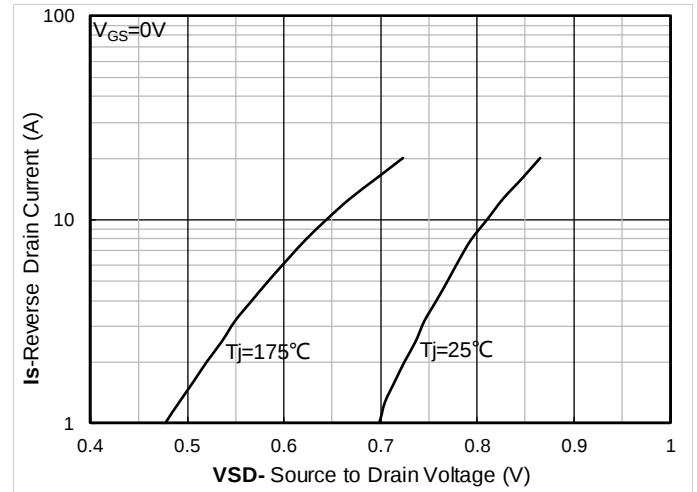


Figure 8. Forward characteristics of reverse diode; typical values

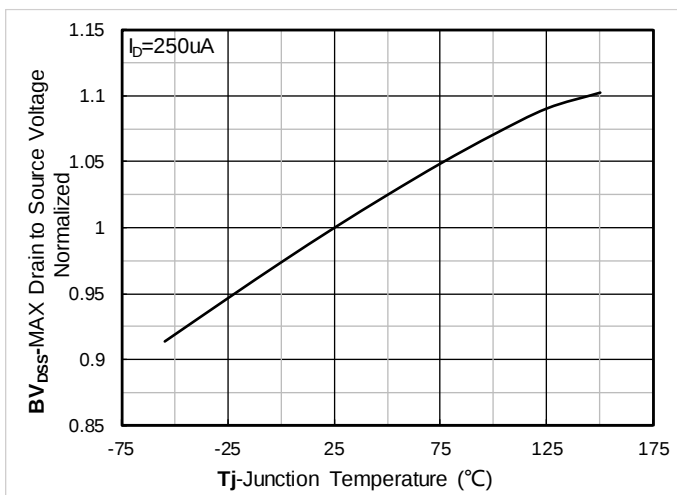


Figure 9. Normalized breakdown voltage

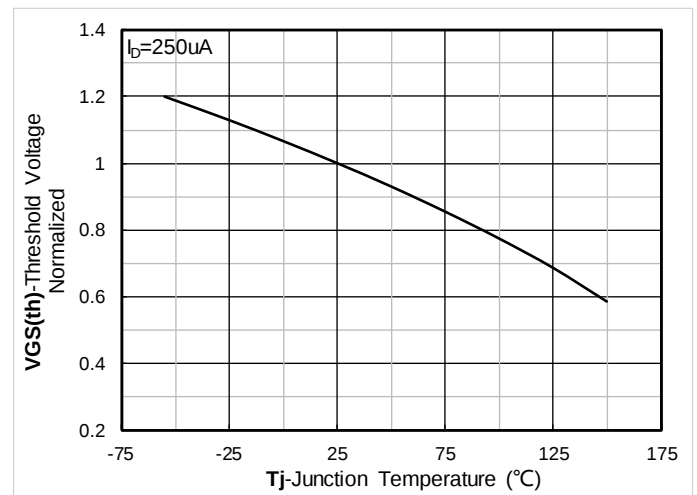


Figure 10. Normalized Threshold voltage

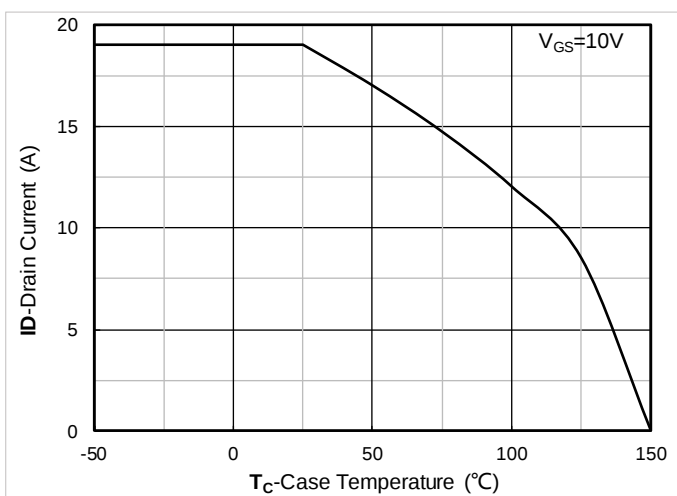


Figure 11. Current dissipation

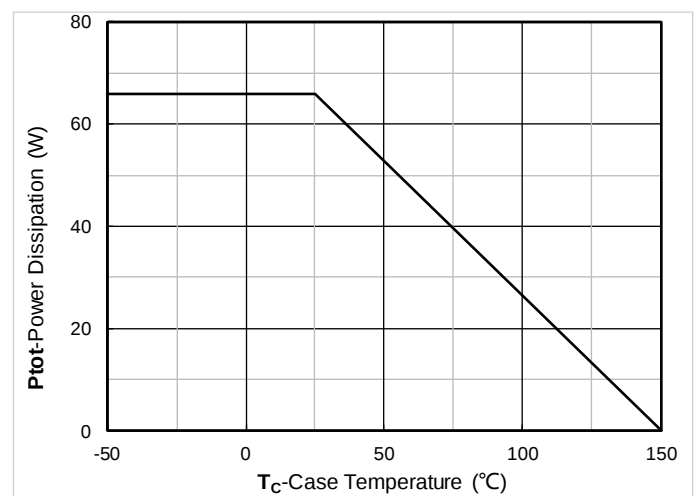


Figure 12. Power dissipation

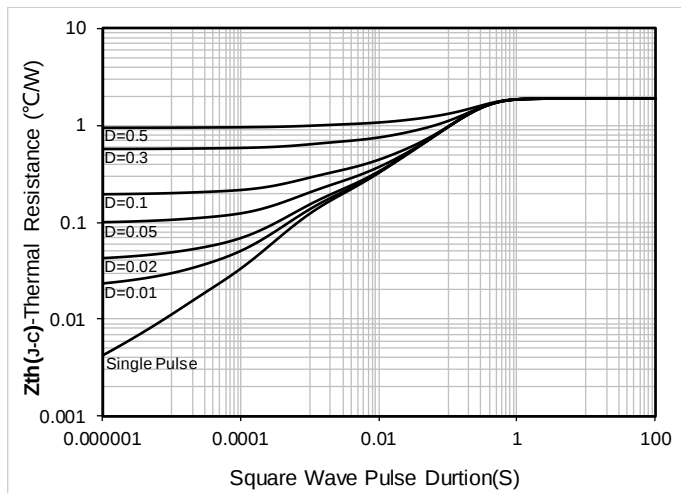


Figure 13. Maximum Transient Thermal Impedance

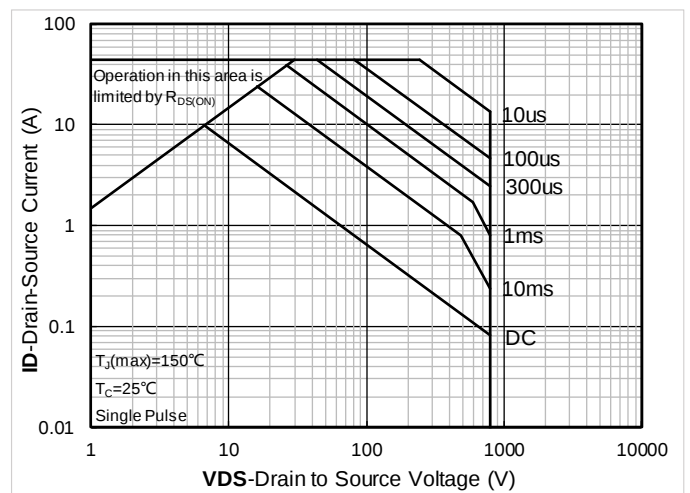
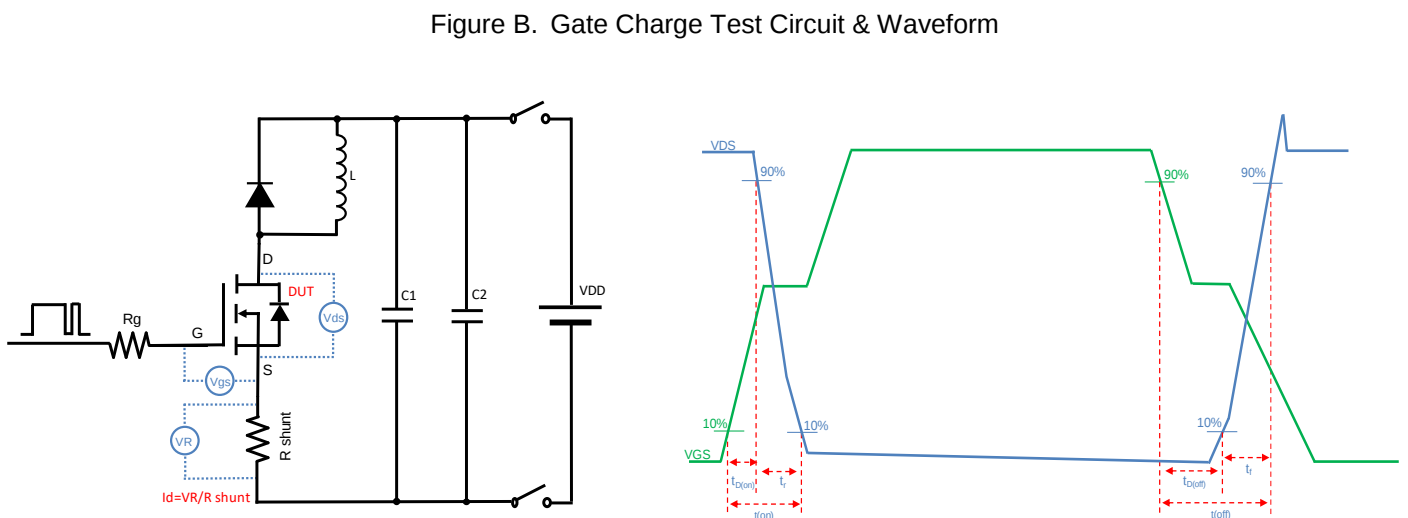
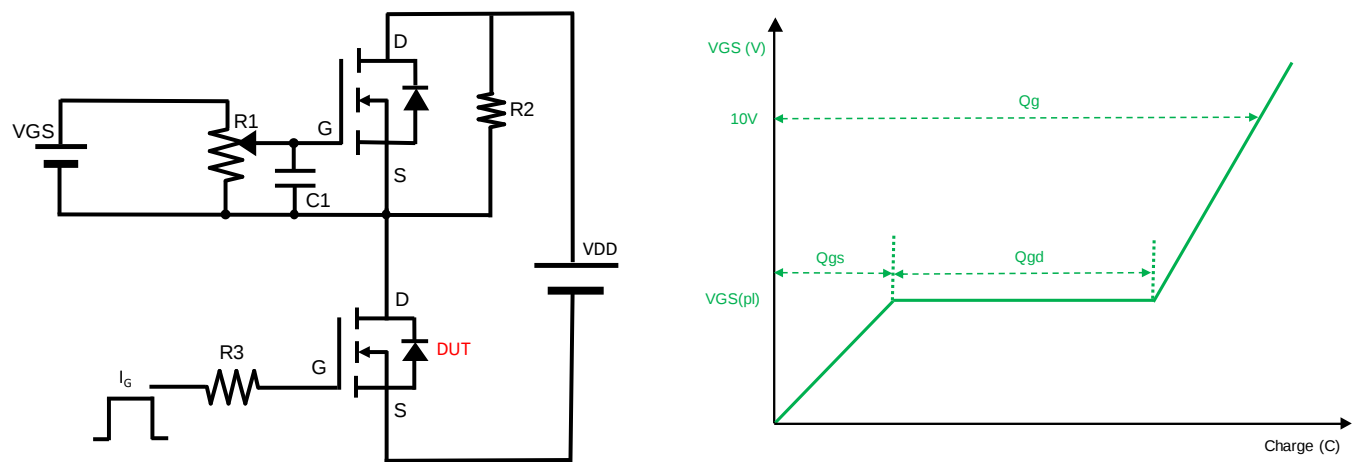
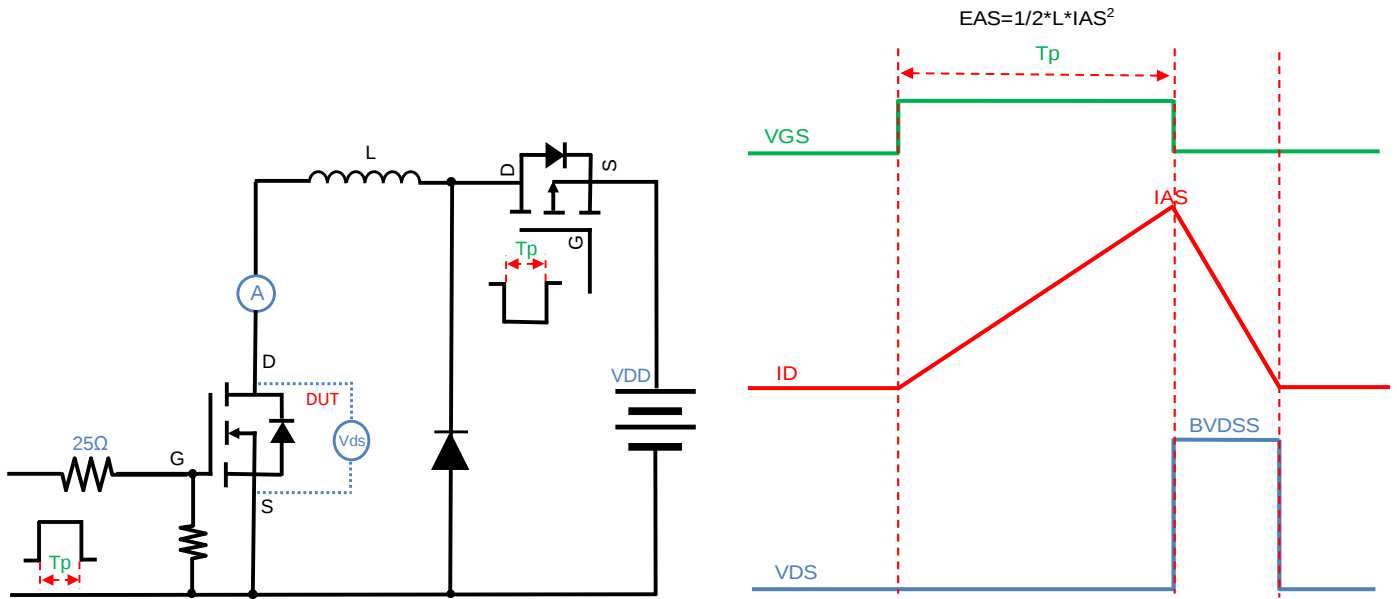


Figure 14. Safe Operation Area

■ Test Circuits & Waveforms



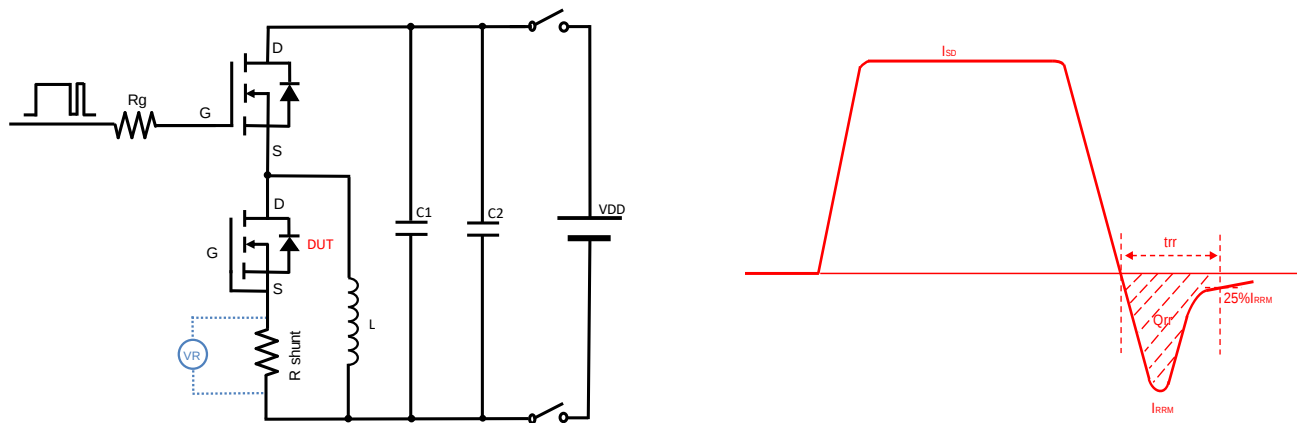
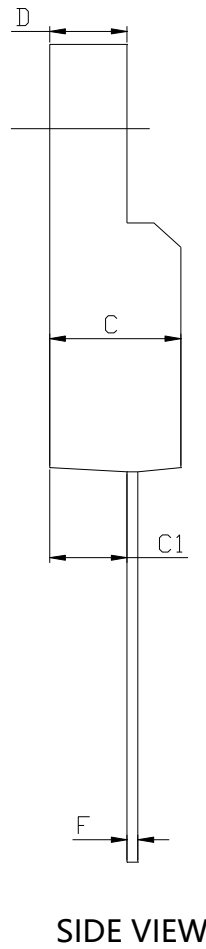
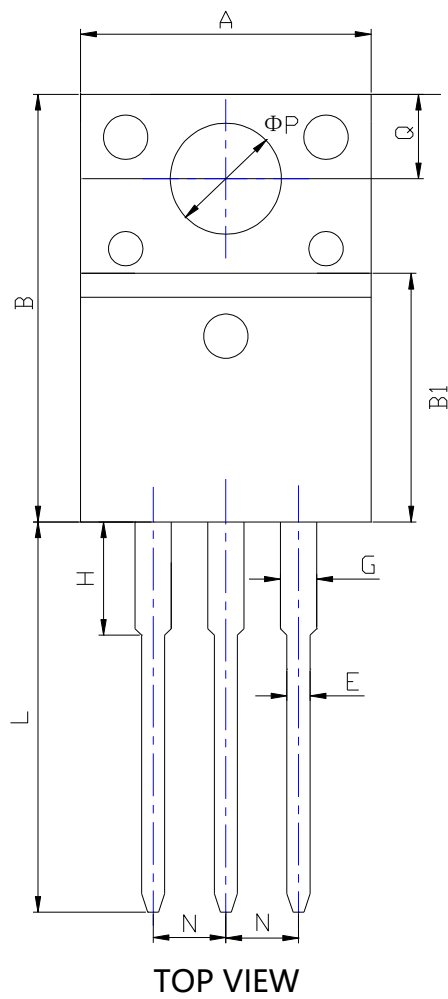


Figure D. Diode Recovery Test Circuit & Waveform

■ ITO-220AB-C Package information



SYMBOL	DIMENSIONS			
	INCHES		Millimeter	
	MIN.	MAX.	MIN.	MAX.
A	0.382	0.406	9.700	10.300
B	0.610	0.634	15.500	16.100
B1	0.354	0.370	8.990	9.390
C	0.177	0.193	4.500	4.900
C1	0.102	0.116	2.600	2.950
D	0.092	0.108	2.340	2.740
E	0.028	0.035	0.700	0.900
F	0.016	0.024	0.400	0.600
G	0.044	0.056	1.120	1.420
H	0.106	0.126	2.700	3.200
L	0.496	0.535	12.600	13.600
N	0.092	0.108	2.340	2.740
Q	0.124	0.140	3.150	3.550
ΦP	0.118	0.130	3.000	3.300

NOTE:

- 1.PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
- 2.TOLERANCE 0.1mm UNLESS OTHERWISE SPECIFIED.

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