



SKSC75N095-T

750V SiC N-Channel MOSFET

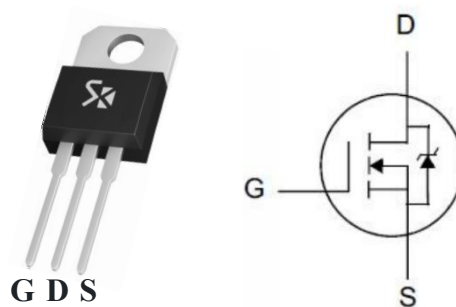
Features

- $R_{DS(ON),max}=115m\Omega@V_{GS}=18V$
- High Blocking Voltage with Low On-Resistance
- Easy to Parallel and Simple to Drive
- High Speed Switching with Low Capacitance
- Avalanche Ruggedness

Applications

- Solar Inverters
- Switch Mode Power Supplies
- High Voltage DC-DC Converters
- Battery Chargers

$BV_{DSS}, T_C=25^{\circ}C$	$R_{DS(ON),max}@18V$	$I_C, T_A=25^{\circ}C$
750V	115m Ω	24A



TO-220

Absolute Maximum Ratings($T_C=25^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-source Voltage	V_{DS}	750	V
Gate-source Operation Voltage	V_{GS}	-10/+22	V
Drain Current-Continuous	I_D	24	A
Drain Current-Continuous@ $T_C=100^{\circ}C$		17	A
Pulsed Drain Current(t_p limited by T_{Jmax})	$I_{D(pulse)}$	79	A
Power Dissipation	P_D	89	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55~+175	$^{\circ}C$

Caution: Stresses greater than those listed in the “Absolute Maximum Ratings” may cause permanent damage to the device.

Thermal Characteristics

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.68	$^{\circ}C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	40	$^{\circ}C/W$



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Electrical Characteristics($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} =0V,I _D =100μA	750			V
Drain-source leakage current	I _{DSS}	V _{DS} =750V,V _{GS} =0V		2	100	μA
Gate-source leakage current	I _{GSS}	V _{GS} =22V,V _{DS} =0V			200	nA
Gate-source leakage current	I _{SGS}	V _{GS} =-10V,V _{DS} =0V			-200	nA
On Characteristics						
Gate Threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =5mA,T _J =25°C	2.2	3.2	4.2	V
		V _{DS} =V _{GS} ,I _D =5mA,T _J =175°C		2.3		V
Drain-source on resistance	R _{DS(on)}	V _{GS} =18V,I _D =15A,T _J =25°C		95	115	mΩ
		V _{GS} =18V,I _D =15A,T _J =175°C		125		mΩ
Gate Resistance	R _G	V _{GS} =0V,V _{AC} =25mV,f=1.0MHz		14		Ω
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =400V, f=1.0MHz		765		pF
Output Capacitance	C _{oss}			49		
Reverse Transfer Capacitance	C _{rss}			3		
Total Gate Charge	Q _g	V _{DD} =400V, V _{GS} =-5/+18V, I _D =15A		32		nC
Gate Source Charge	Q _{gs}			14		
Gate Drain Charge	Q _{gd}			3.2		
Resistive Switching Characteristics						
Turn-on Delay Time	t _{d(ON)}	V _{GS} =-5/+18V, I _D =15A,V _{DS} =400V, R _G =5.1Ω		24		ns
Rise Timer	t _r			13		
Turn-Off Delay Time	t _{d(OFF)}			18		
Fall Timer	t _f			8		
Turn-On Switching Energy	E _{ON}	V _{GS} =-5/+18V, I _D =15A,V _{DS} =400V, R _G =5.1Ω		120		μJ
Turn-Off Switching Energy	E _{OFF}			39		
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =-5V,I _{SD} =7.5A,T _J =25°C		4.2		V
	V _{SD}	V _{GS} =-5V,I _{SD} =7.5A,T _J =175°C		3.8		V
Continuous Diode Forward Current	I _{SD}	T _C =25°C		19		A
		T _C =100°C		10		
Reverse Recovery Time	t _{rr}	V _{GS} =-5V,I _{SD} =15A, V _R =400V,T _J =25°C, di/dt=750A/μs		22		ns
Reverse Recovery Charge	Q _{rr}			66		nC
Peak Reverse Recovery Current	I _{rrm}				5	



Typical Characteristics

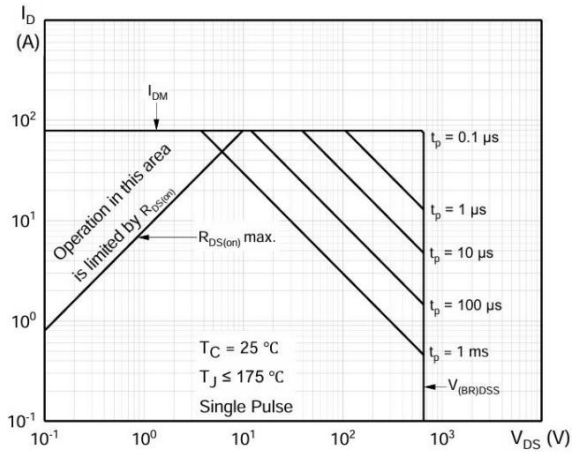


Figure 1. Safe Operating Area

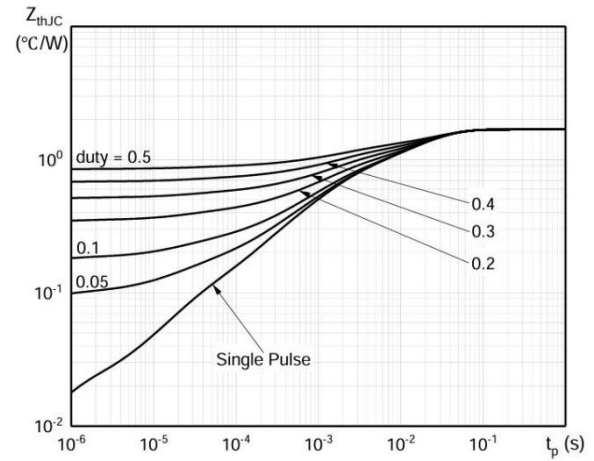


Figure 2. Maximum Transient Thermal Impedance

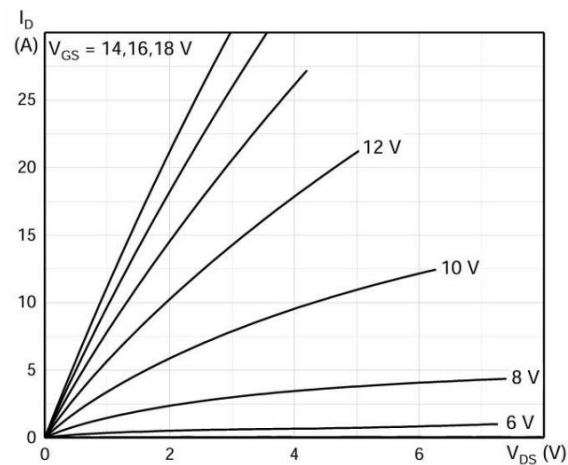


Figure 3. Typical Output Characteristics, $T_J = 25^\circ\text{C}$

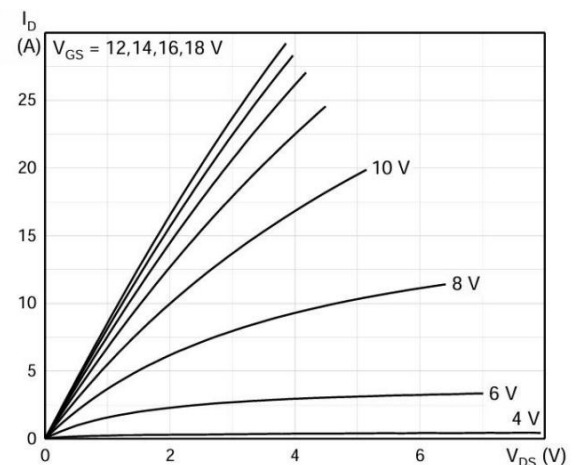


Figure 4. Typical Output Characteristics, $T_J = 175^\circ\text{C}$

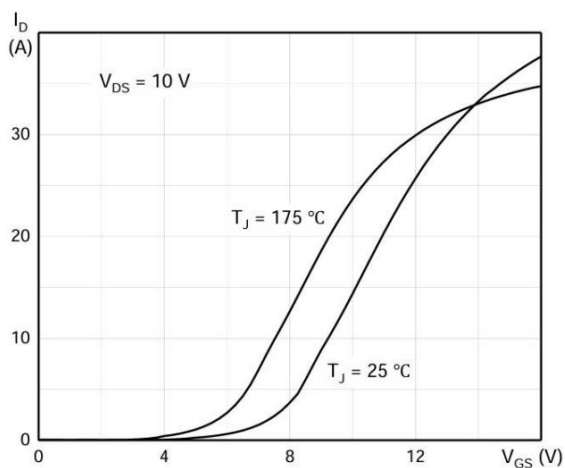


Figure 5. Typical Transfer Characteristics

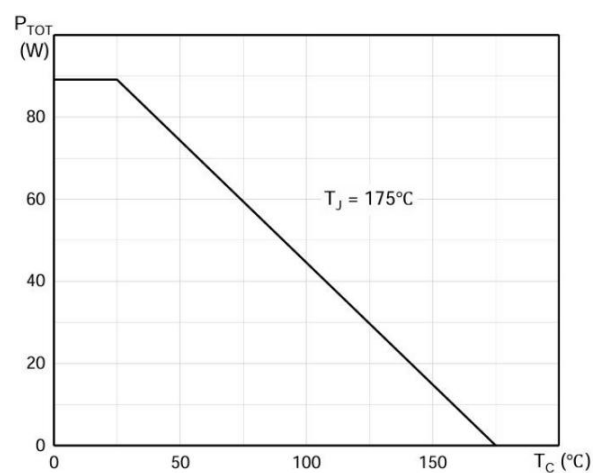


Figure 6. Total Power Dissipation



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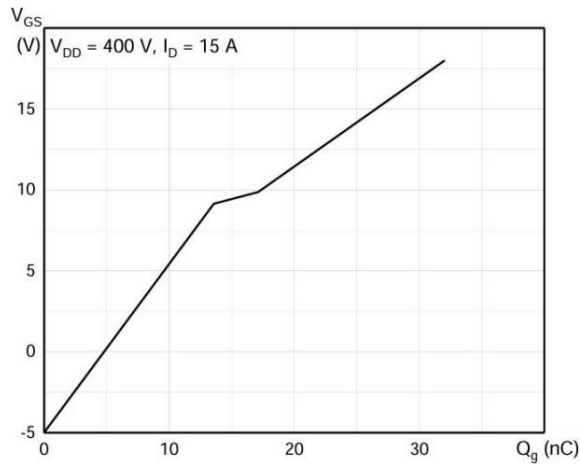


Figure 7. Typical Gate Charge Characteristics

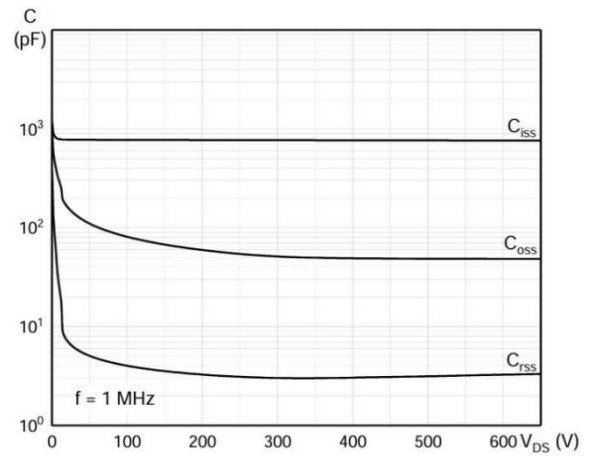


Figure 8. Typical Capacitance Characteristics

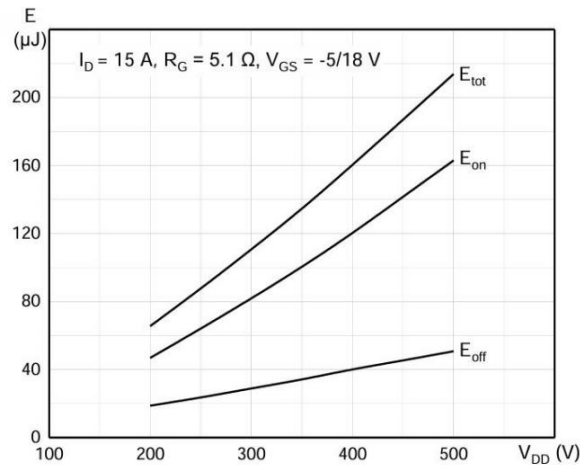


Figure 9. Typical Switching Energy vs. Supply Voltage

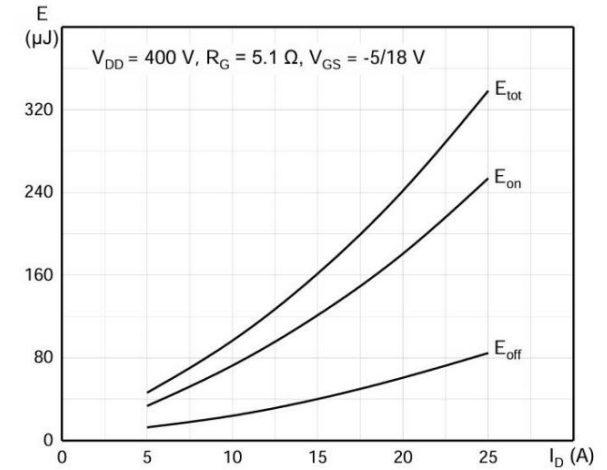


Figure 10. Typical Switching Energy vs. Drain Current

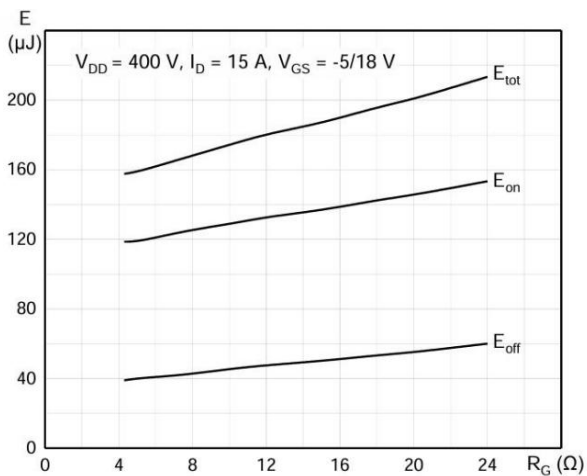


Figure 11. Typical Switching Energy vs. Gate Resistance

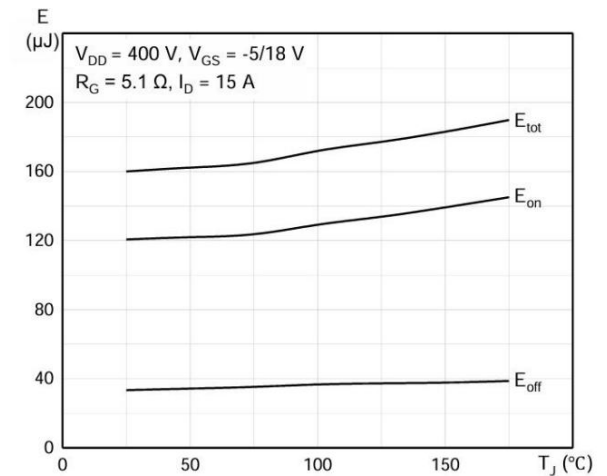


Figure 12. Typical Switching Energy vs. Temperature



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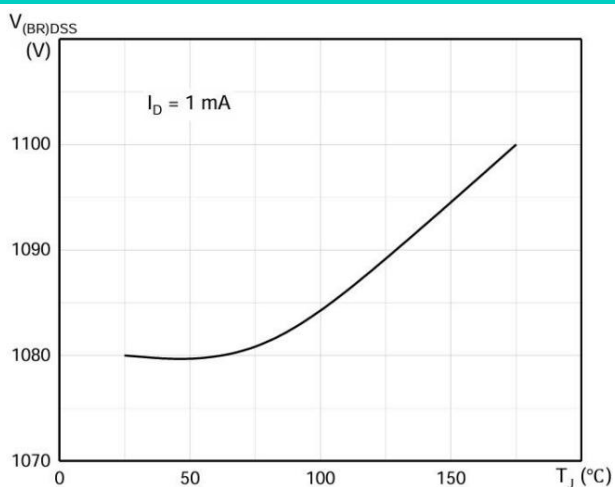


Figure 13. Breakdown Voltage vs. Temperature

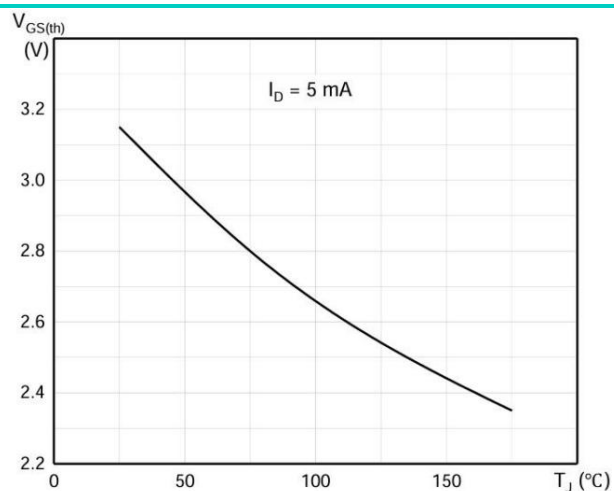


Figure 14. Gate Threshold vs. Temperature

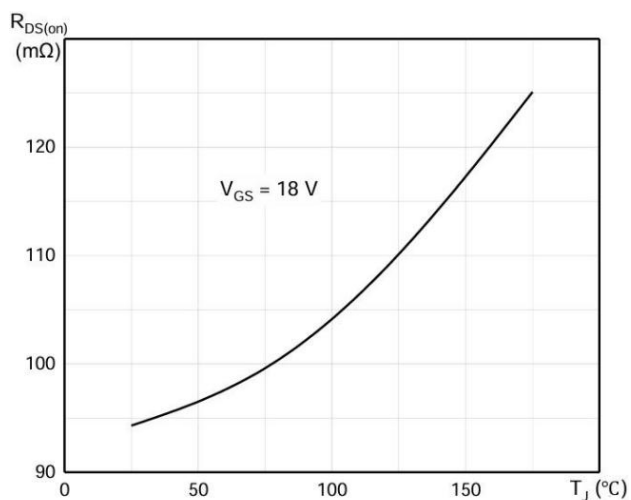


Figure 15. On-Resistance vs. Temperature

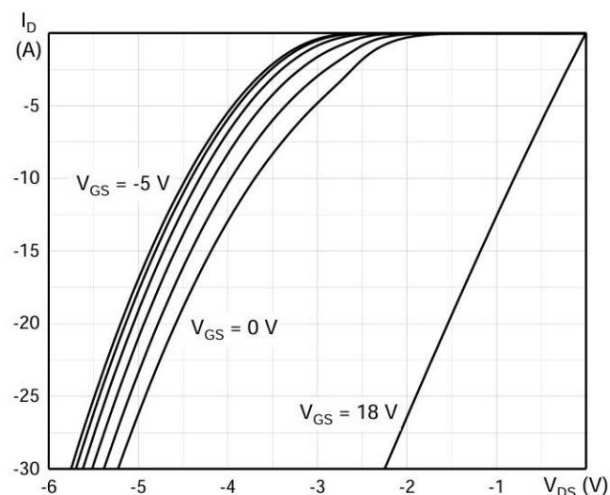


Figure 16. Body Diode Characteristics, $T_J = 25^\circ\text{C}$

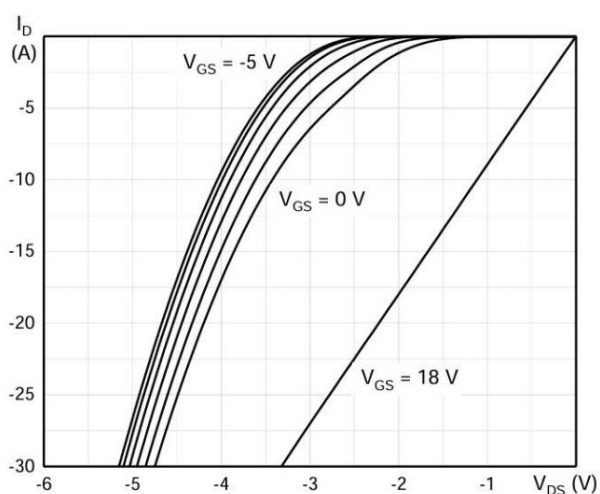
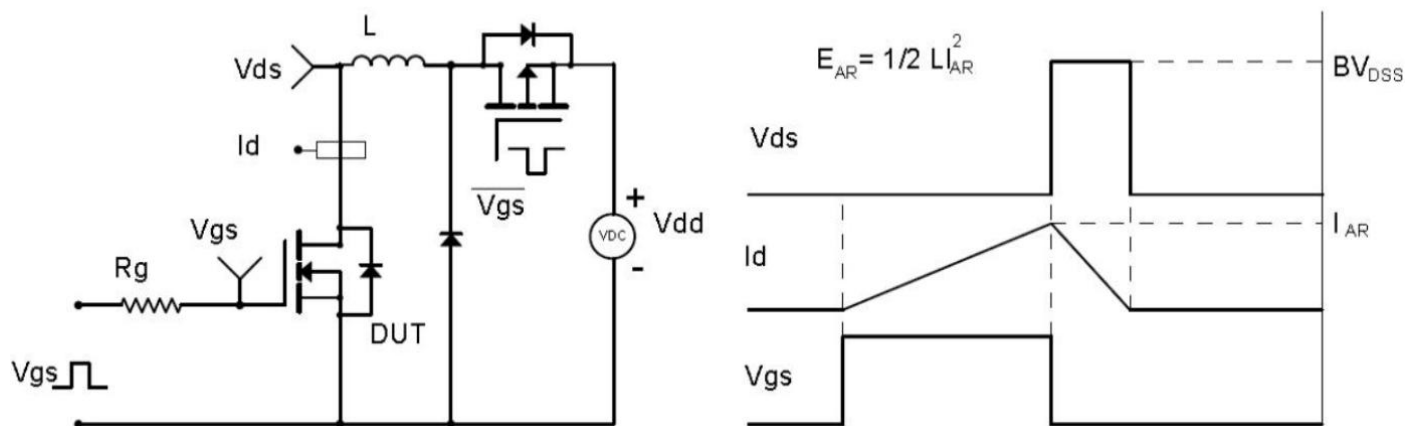


Figure 17. Body Diode Characteristics, $T_J = 175^\circ\text{C}$

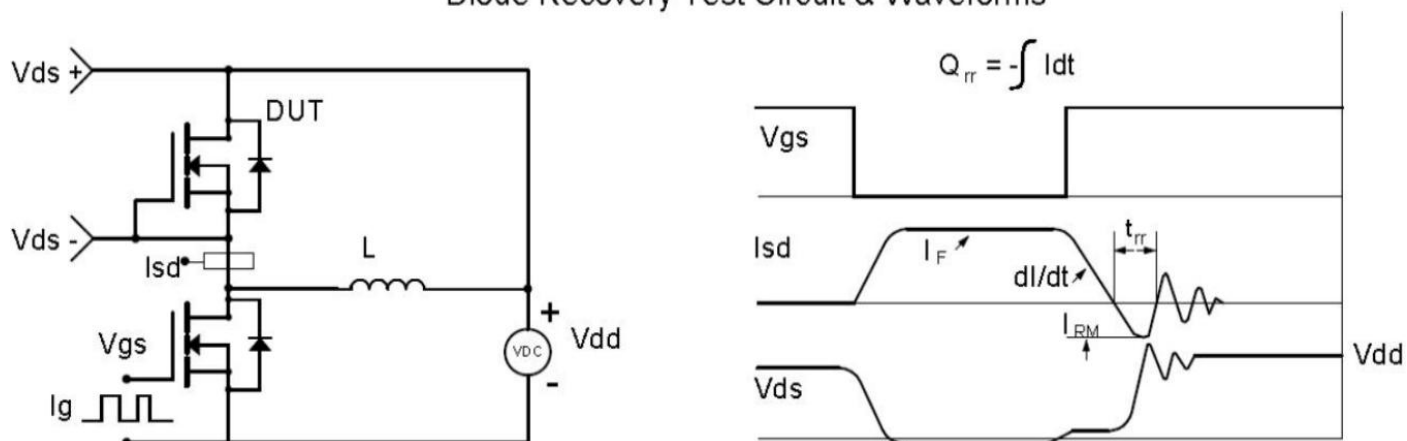


Test Circuit Waveforms

Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms



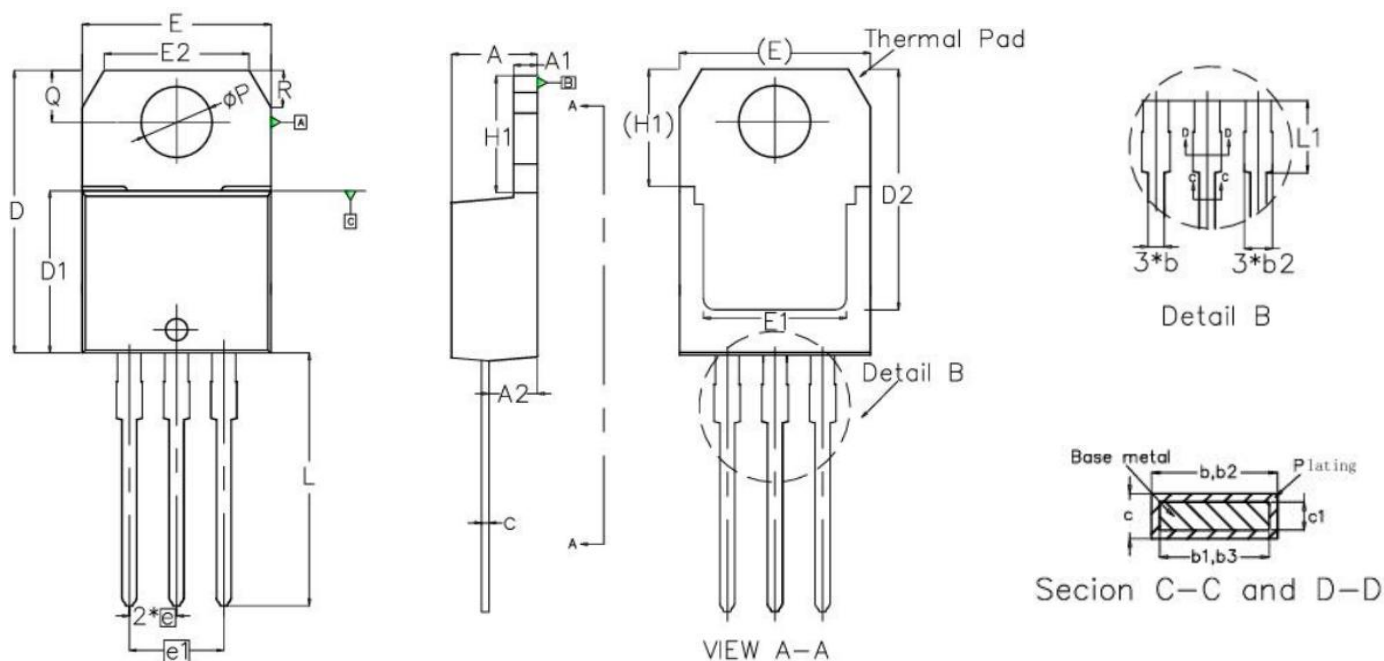


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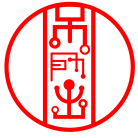
Package Information

TO-220

Dimensions in mm



Symbol	Common Dimensions			Symbol	Common Dimensions		
	Min	Nom	Max		Min	Nom	Max
A	4.35	4.45	4.75	E1	6.86	7.60	8.89
A1	1.14	1.27	1.40	e	2.41	2.54	2.67
A2	2.40	2.60	2.80	e1	4.88	5.08	5.28
b	0.85	0.69	1.01	H1	6.00	6.20	6.40
b1	0.38	0.83	0.97	L	13.00	13.35	13.70
b2	1.20	1.46	1.73	L1	2.70	3.00	3.30
b3	1.14	1.44	1.73	ΦP	3.70	3.80	3.95
c	0.36	0.50	0.61	Q	2.60	2.80	3.00
c1	0.36	0.48	0.56	E2	7.50	7.80	8.10
D	15.20	15.50	15.80	R	1.70	2.00	2.20
D1	8.50	-	9.02				
D2	12.20	12.85	12.88				
E	10.00	10.18	10.40				



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