

Features

- ◇ High Speed Power Switching, Logic Level
- ◇ Enhanced Body diode dv/dt capability
- ◇ Enhanced Avalanche Ruggedness
- ◇ 100% UIS Tested, 100% Rg Tested
- ◇ Lead Free, Halogen Free

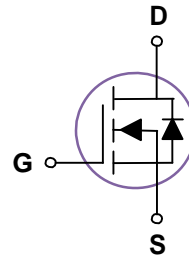
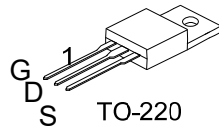
Application

- ◇ Synchronous Rectification in SMPS
- ◇ Hard Switching and High Speed Circuit
- ◇ DC/DC in Telecoms and Industrial

Product Summary



V_{DS}	100	V
$R_{DS(on),typ} \quad V_{GS}=10V$	9	$m\Omega$
I_D	75	A



Absolute Maximum Ratings at $T_J=25^\circ\text{C}$ (unless otherwise specified)

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current (Silicon Limited)	I_D	$T_C=25^\circ\text{C}$	75	A
		$T_C=100^\circ\text{C}$	38	
Drain to Source Voltage	V_{DS}	-	100	V
Gate to Source Voltage	V_{GS}	-	+20/-12	V
Pulsed Drain Current	I_{DM}	-	80	A
Avalanche Energy, Single Pulse	E_{AS}	$L=0.1\text{mH}, T_C=25^\circ\text{C}$	80	mJ
Power Dissipation	P_D	$T_C=25^\circ\text{C}$	3.1	W
Operating and Storage Temperature	T_J, T_{stg}	-	-55 to 150	$^\circ\text{C}$

Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Lead	$R_{\theta JL}$	23	$^\circ\text{C/W}$
Thermal Resistance Junction-Ambient ($t \leq 10\text{s}$)	$R_{\theta JA}$	40	$^\circ\text{C/W}$
Thermal Resistance Junction-Ambient (steady state)		75	$^\circ\text{C/W}$

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

Static Characteristics

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1	1.8	2.5	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS}=0V, V_{DS}=95V, T_j=25^\circ\text{C}$	-	-	1	μA
		$V_{GS}=0V, V_{DS}=95V, T_j=125^\circ\text{C}$	-	-	100	
Gate to Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=14A$	-	9	12	m Ω
		$V_{GS}=4.5V, I_D=10A$	-	12	15.5	
Transconductance	g_{fs}	$V_{DS}=5V, I_D=14A$	-	70	-	S
Gate Resistance	R_G	$V_{GS}=0V, V_{DS}$ Open, $f=1\text{MHz}$	-	1.5	-	Ω

Dynamic Characteristics

Input Capacitance	C_{iss}	$V_{GS}=0V, V_{DS}=50V, f=1\text{MHz}$	-	3350	-	pF
Output Capacitance	C_{oss}		-	270	-	
Reverse Transfer Capacitance	C_{rss}		-	15	-	
Total Gate Charge	$Q_g(10V)$	$V_{DD}=50V, I_D=14A, V_{GS}=10V$	-	49	-	nC
Total Gate Charge	$Q_g(4.5V)$		-	21	-	
Gate to Source Charge	Q_{gs}		-	8	-	
Gate to Drain (Miller) Charge	Q_{gd}		-	7	-	
Turn on Delay Time	$t_{d(on)}$	$V_{DD}=50V, I_D=14A, V_{GS}=10V, R_G=10\Omega,$	-	10	-	ns
Rise time	t_r		-	5	-	
Turn off Delay Time	$t_{d(off)}$		-	32	-	
Fall Time	t_f		-	6	-	

Reverse Diode Characteristics

Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_F=14A$	-	0.9	1.2	V
Reverse Recovery Time	t_{rr}	$V_R=50V, I_F=14A, di_F/dt=500A/\mu s$	-	47	-	ns
Reverse Recovery Charge	Q_{rr}		-	226	-	nC



Fig 1. Typical Output Characteristics

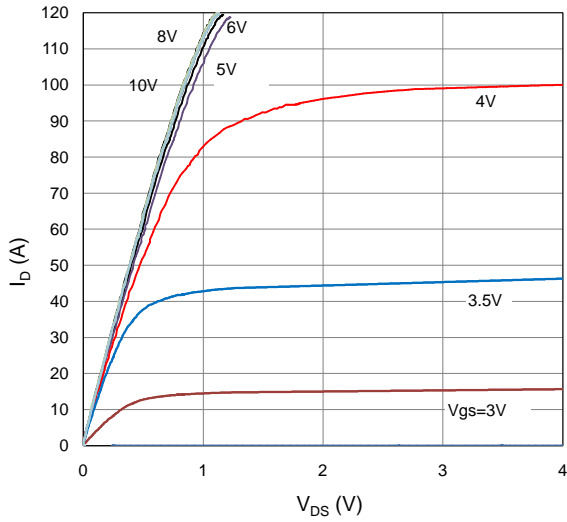


Figure 2. On-Resistance vs. Gate-Source Voltage

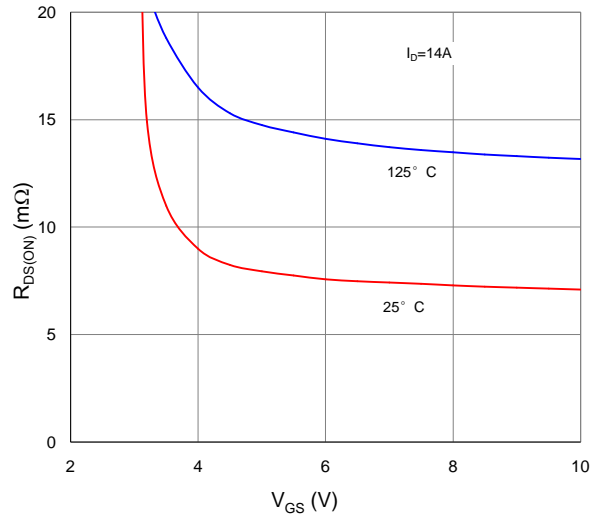


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

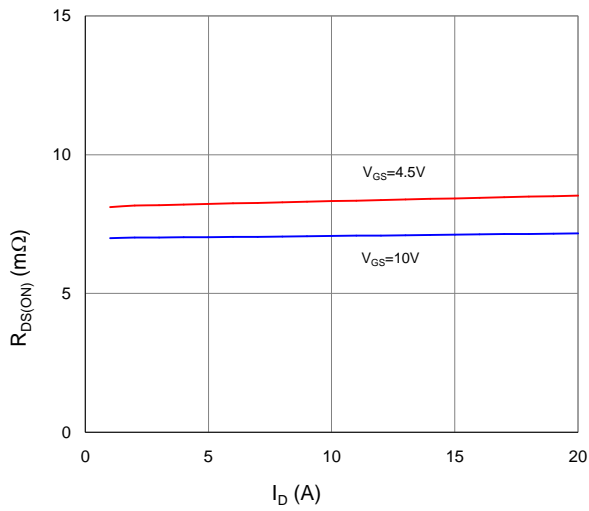


Figure 4. Normalized On-Resistance vs. Junction Temperature

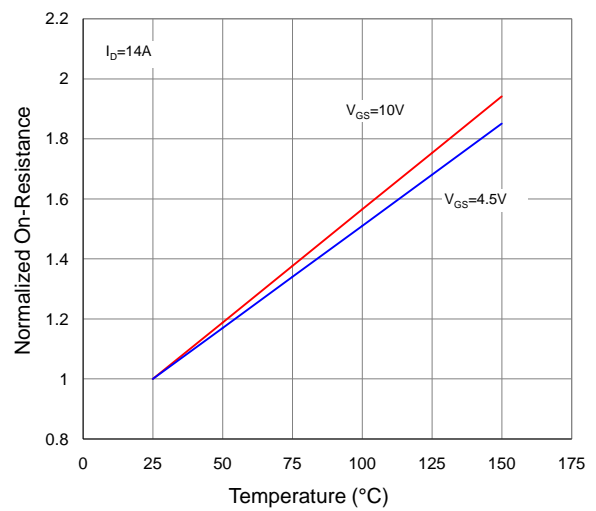


Figure 5. Typical Transfer Characteristics

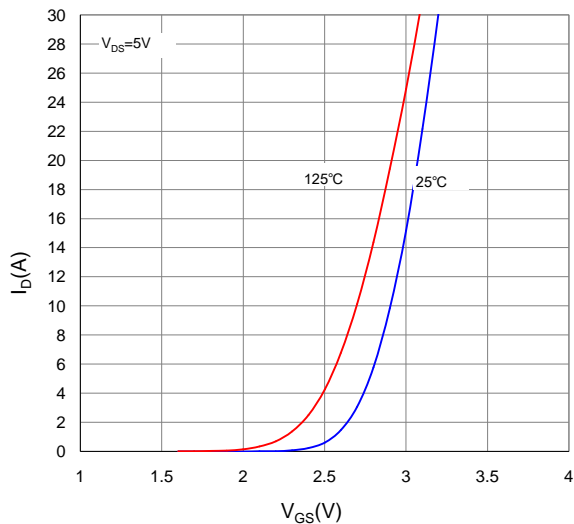


Figure 6. Typical Source-Drain Diode Forward Voltage

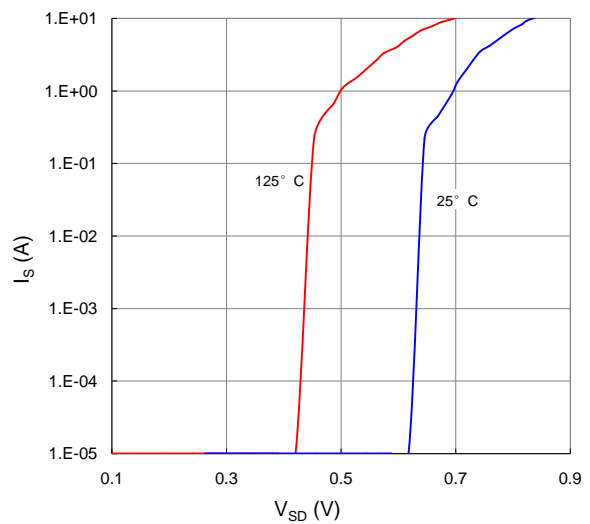




Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

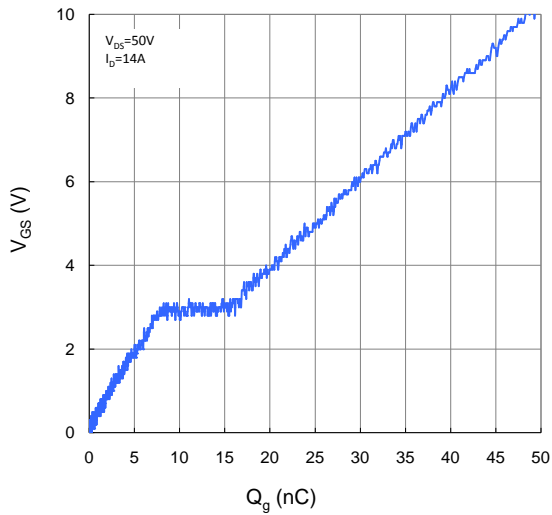


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

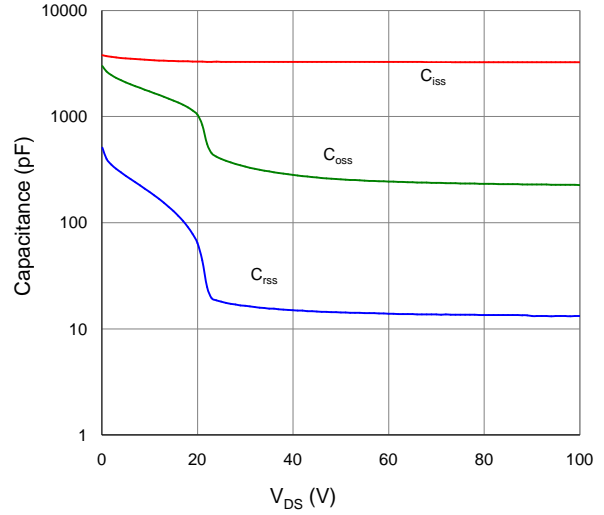


Figure 9. Maximum Safe Operating Area

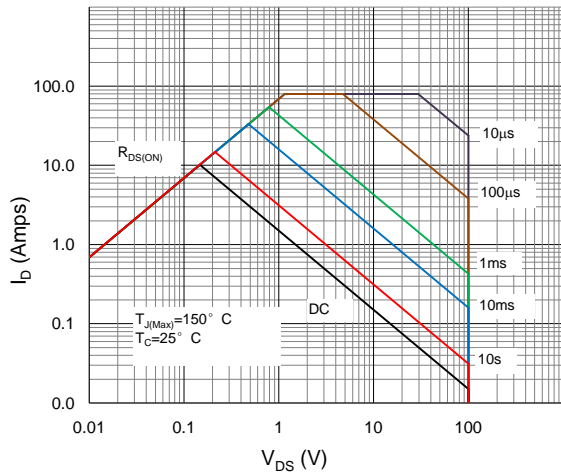


Figure 10. Maximum Drain Current vs. Case Temperature

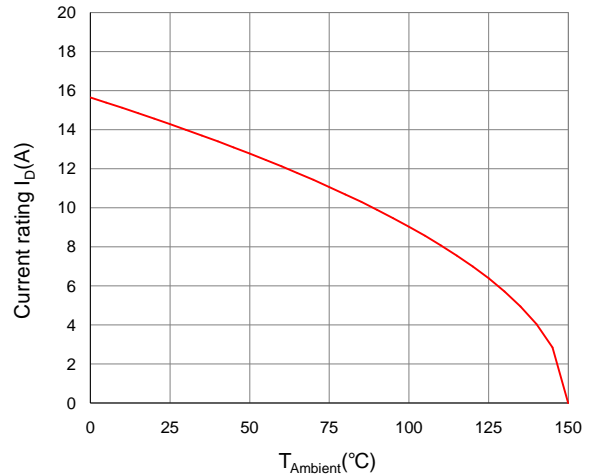
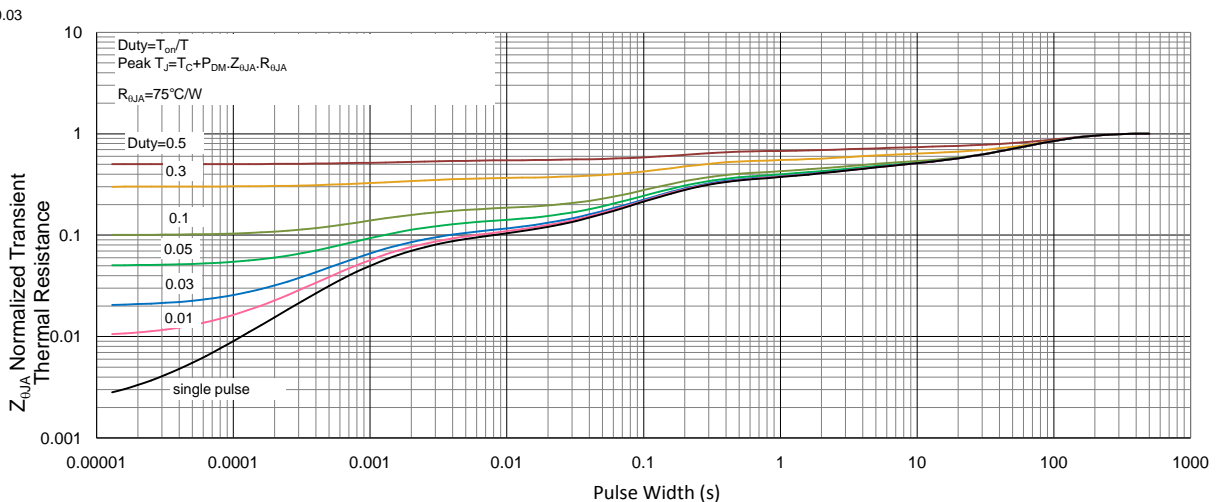
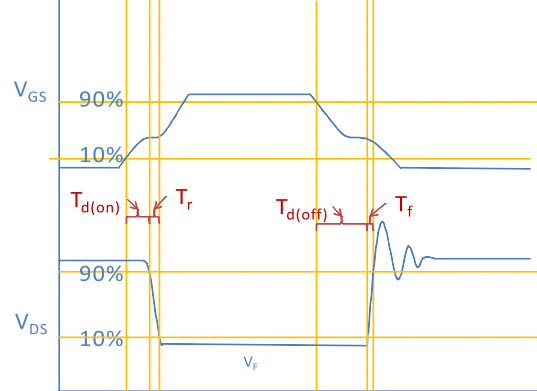
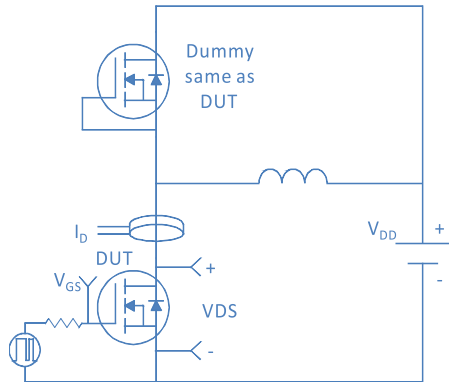


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Ambient

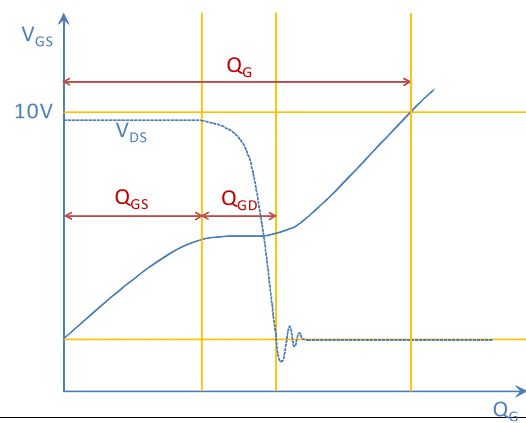
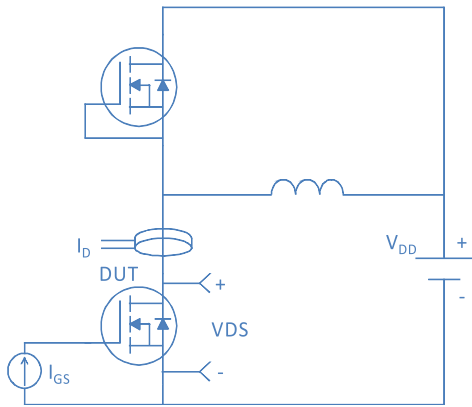




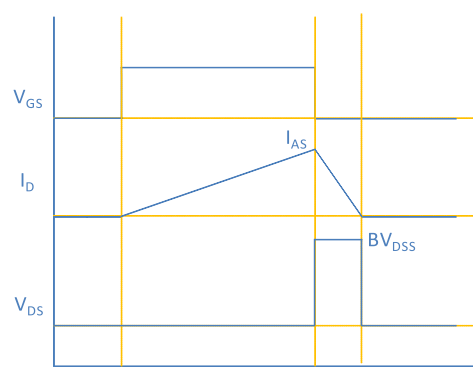
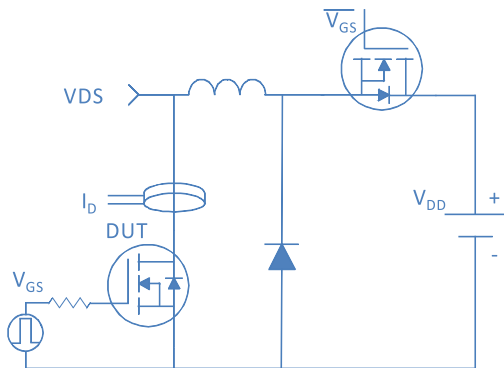
Inductive switching Test



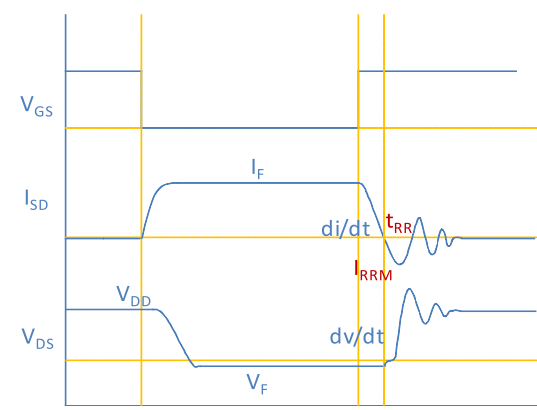
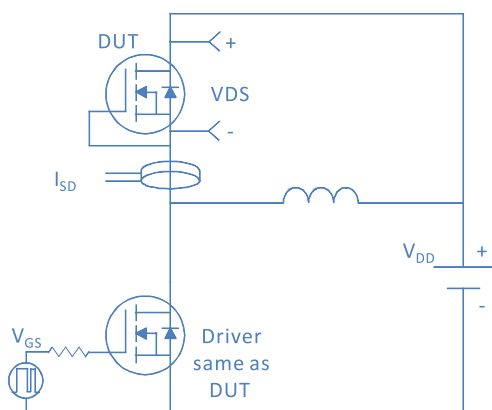
Gate Charge Test



Uclamped Inductive Switching (UIS) Test



Diode Recovery Test





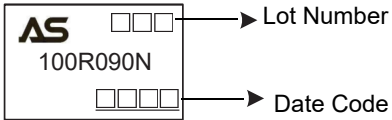
ASCENDSEMI

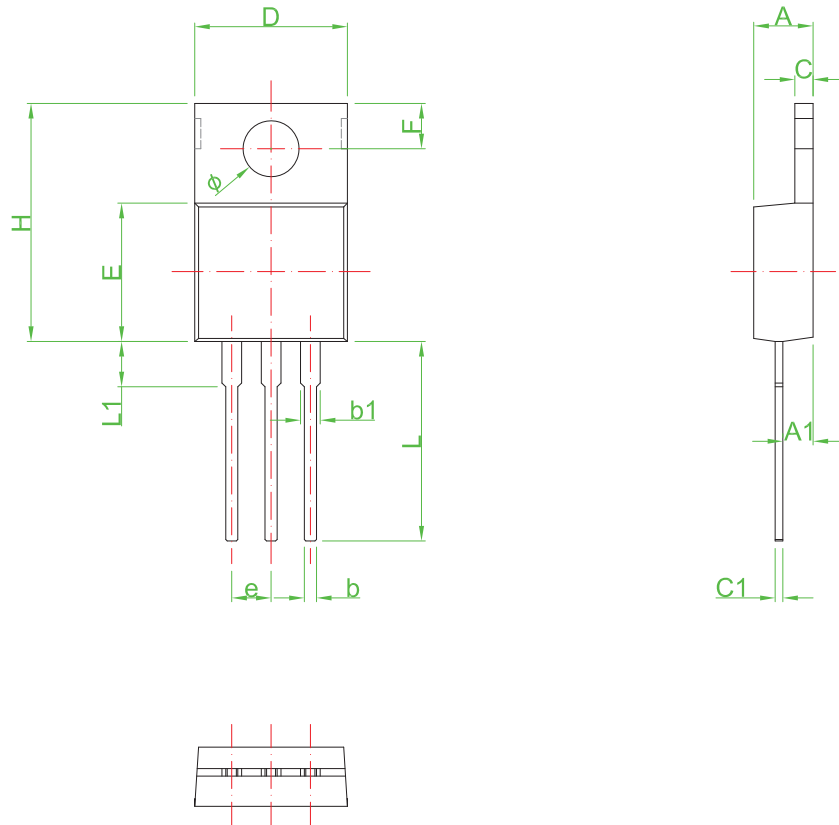
ASDM100R090NP

100V N-CHANNEL MOSFET

Ordering and Marking Information

Ordering Device No.	Marking	Package	Packing	Quantity
ASDM100R090NP-T	100R090N	TO-220	TUBE	50

PACKAGE	MARKING
TO-220	 <p>AS □□□ → Lot Number 100R090N □□□□ → Date Code</p>



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.00	4.80	0.157	0.189
A1	1.80	2.80	0.071	0.110
b	0.60	1.00	0.024	0.039
b1	1.14	1.78	0.045	0.070
C	1.00	1.40	0.039	0.055
C1	0.36	0.61	0.014	0.024
D	9.90	10.50	0.390	0.413
E	8.38	9.20	0.330	0.362
e	2.54 TYP		0.100 TYP	
F	2.54	3.20	0.100	0.126
ϕ	3.50	3.90	0.138	0.154
H	14.48	15.87	0.570	0.625
L	13.00	13.80	0.512	0.543
L1	---	4.10	---	0.161

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