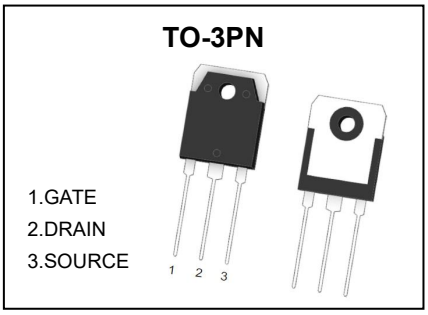
SZCJ

TO-3PN Plastic-Encapsulate MOSFETS

M1 N-Channel Power MOSFET



Key Performance Parameters

$V_{BR(DSS)}$	$R_{DS(on)}$TYP	I_D
1500V	6Ω@10V	3A

DESCRIPTION

The N-channel mode power MOSFET is using advanced technology to provide customers with planar stripe. This technology specializes in allowing a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode. The device is universally applied in high efficiency switch mode power supply.

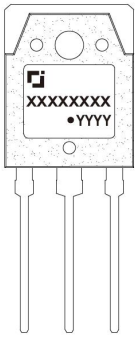
FEATURES

- Excellent package for good heat dissipation
- High switching speed
- 100% avalanche tested

APPLICATIONS

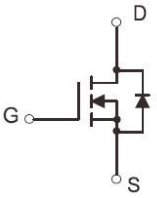
- Power switching application
- DC/DC converters

MARKING



XXXXXX = 03N150M1
Solid dot = Green molding compound device.
YYYY = Code.

EQUIVALENT CIRCUIT



ABSOLUTE MAXIMUM RATINGS (T_J=25℃ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	1500	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current	I_D	3	A
Pulsed Drain Current	I_{DM}①②	12	A
Avalanche Current	I_{AS}③	5.5	A
Single Pulsed Avalanche Energy	E_{AS}③	7.5	mJ
Power Dissipation	P_D①	298	W
Operating Junction and Storage Temperature Range	T_J,T_{stg}	-55~+150	℃

Thermal Characteristics

Parameter	Symbol	Value		Unit
		Typ	Max	
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.28	0.42	℃/W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$⑥	30	45	℃/W

Typical Characteristics

ELECTRICAL CHARACTERISTICS (T_J=25℃ unless otherwise specified)

Static Characteristics

Parameter	Symbol	Test Condition		Value			Unit
				Min	Typ	Max	
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA		1500	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=1500V, V_{GS}=0V	T_J=25℃	-	-	1.0	μA
			T_J=125℃	-	-	100	
Gate-body leakage current	I_{GSS}	V_{GS}=±30V, V_{DS}=0V		-	-	±100	nA
Gate-threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA		3.0	4.3	5.0	V
Static drain-source on-sate resistance	$R_{DS(on)}$④	V_{GS}=10V, I_D=1.3A	T_J=25℃	-	6	9	Ω
			T_J=125℃	-	13.3	20	

Dynamic Characteristics⑤

Input capacitance	C_{iss}	V_{GS}=0V, V_{DS}=750V, f=1MHz	-	1027	-	pF
Output capacitance	C_{oss}		-	19	-	
Reverse transfer capacitance	C_{rss}		-	3	-	
Gate resistance	R_g	f=1MHz	-	2.5	-	Ω
Total gate charge	Q_g	V_{GS}=10V, V_{DS}=750V, I_D=1.3A	-	38.7	-	nC
Gate charge at threshold	$Q_{G(th)}$		-	4.6	-	
Gate-source charge	Q_{gs}		-	5.6	-	
Gate-drain charge	Q_{gd}		-	23.5	-	
Turn-on delay time	$t_{d(on)}$	V_{DD}=750V, V_{GS}=10V, I_D=1.3A, R_g=3Ω	-	10.3	-	ns
Turn-on rise time	t_r		-	9.3	-	
Turn-off delay time	$t_{d(off)}$		-	31	-	
Turn-off fall time	t_f		-	57	-	

Reverse Diode Characteristics

Drain-source diode forward voltage	V_{SD}④	V_{GS}=0V, I_S=2.5A	-	-	1.6	V
Continuous drain-source diode forward current	I_S①		-	-	3	A
Pulsed drain-source diode forward current	I_{SM}①②		-	-	12	A
Reverse recovery time	t_{rr}	V_{DD}=50V, I_S=1.3A, di/dt=100A/μs	-	693	-	ns
Reverse recovery charge	Q_{rr}		-	2243	-	nC

Notes:

①.T_C=25℃ Limited only by maximum temperature allowed.

②.P_W ≤10μs, Duty cycle ≤1%.

③.EAS condition: V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_g=25Ω Starting T_J=25℃.

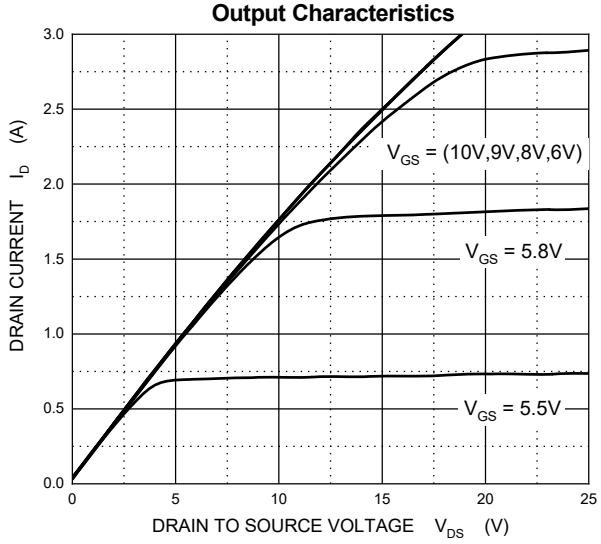
④.Pulse Test : Pulse Width ≤380μs, duty cycle ≤2%.

⑤.Guaranteed by design, not subject to production.

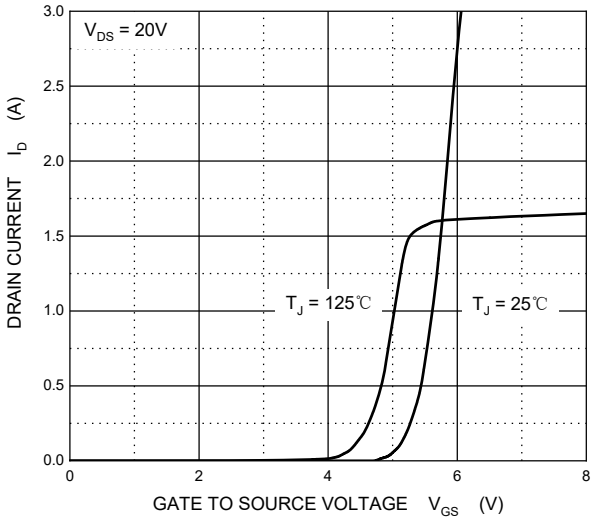
⑥.Device mounted in a still air environment with T_A=25℃.

Typical Characteristics

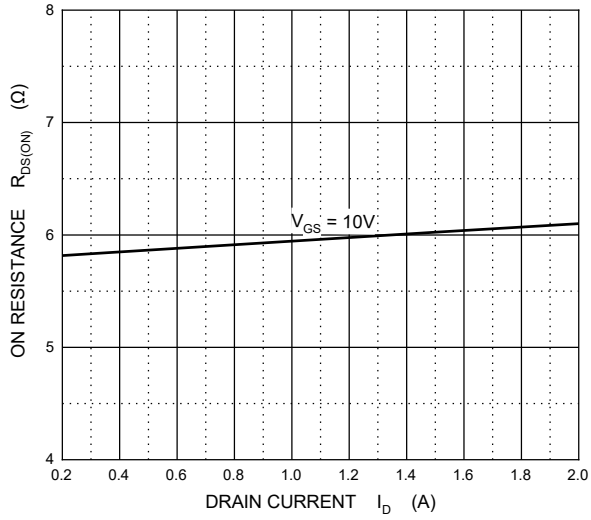
Output Characteristics



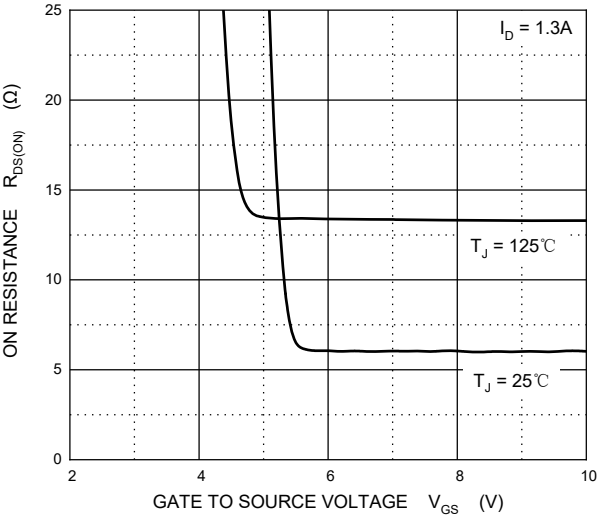
Transfer Characteristics



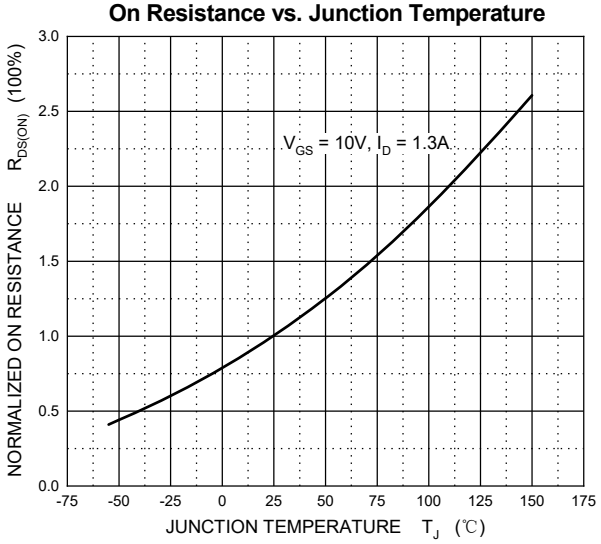
On Resistance vs. Drain Current



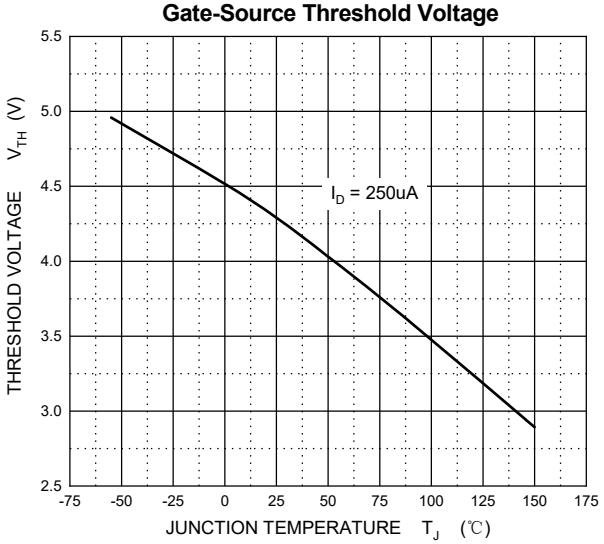
On Resistance vs. Gate-Source Bias



On Resistance vs. Junction Temperature

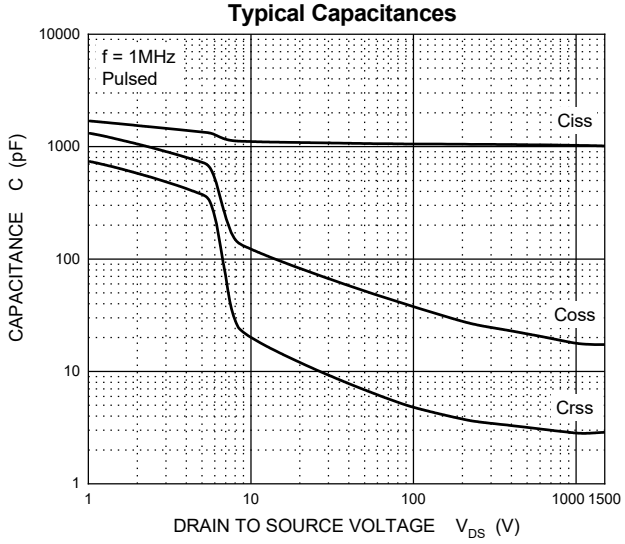


Gate-Source Threshold Voltage

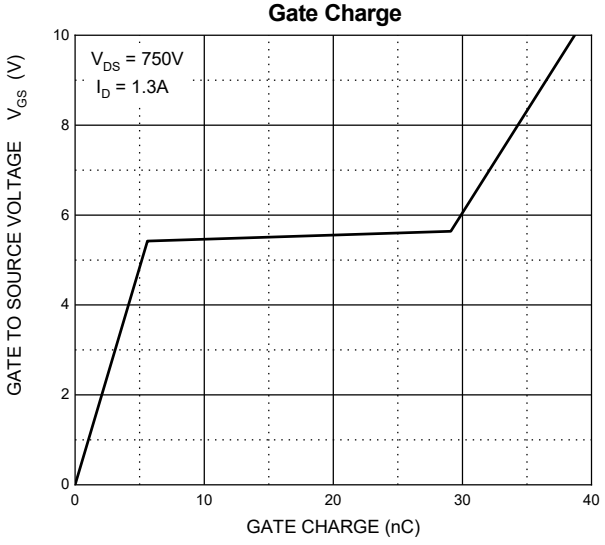


Typical Characteristics

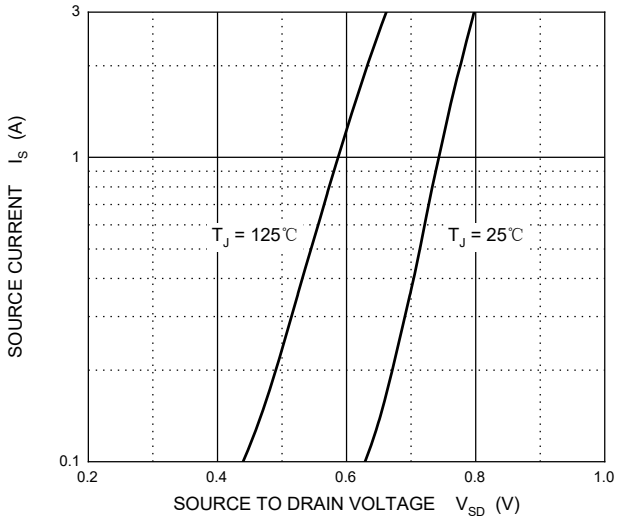
Typical Capacitances



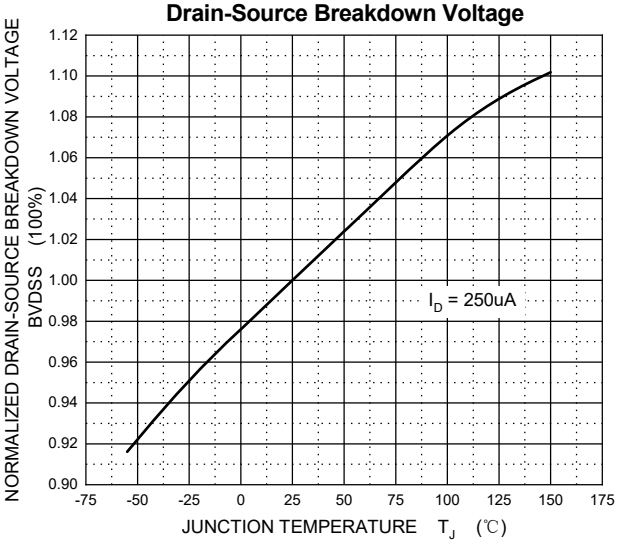
Gate Charge



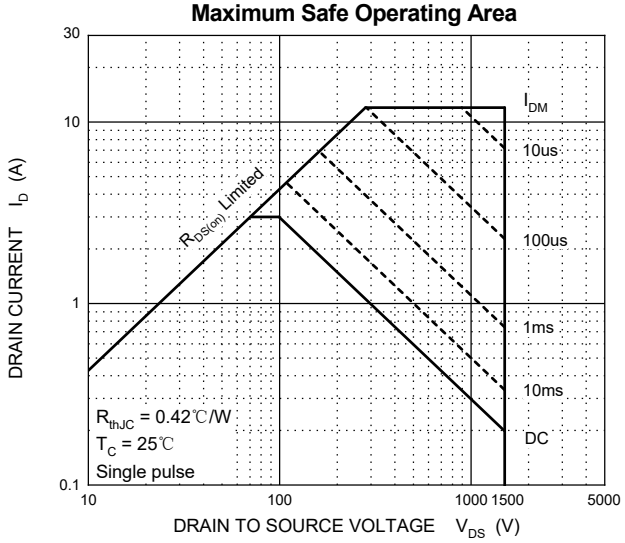
Source-Drain Diode Forward Characteristics



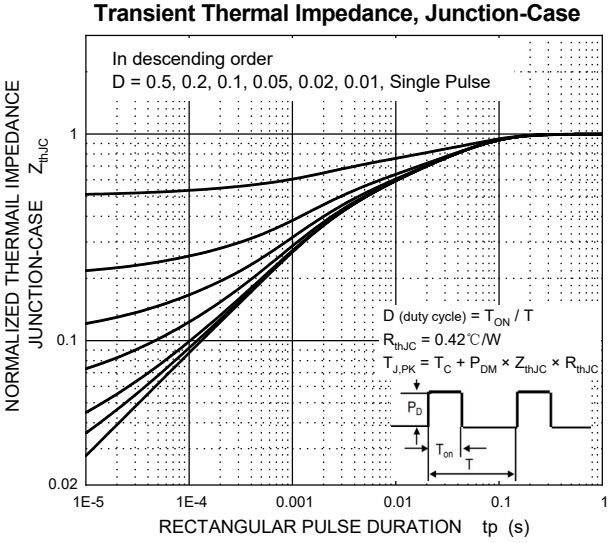
Drain-Source Breakdown Voltage



Maximum Safe Operating Area

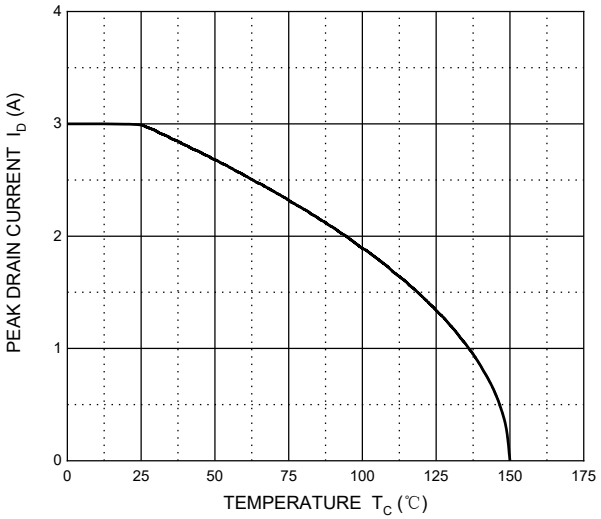


Transient Thermal Impedance, Junction-Case

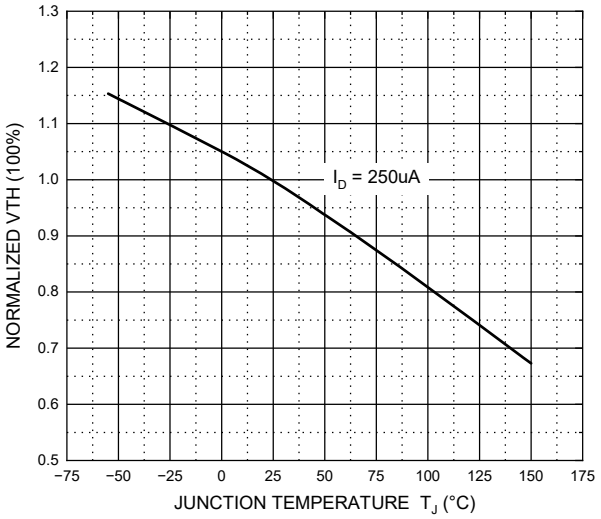


Typical Characteristics

ID vs. TC

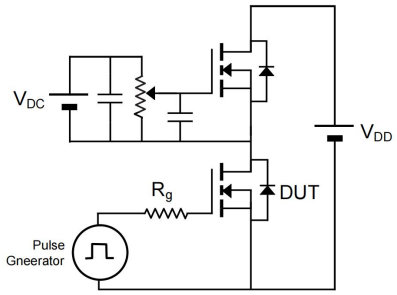


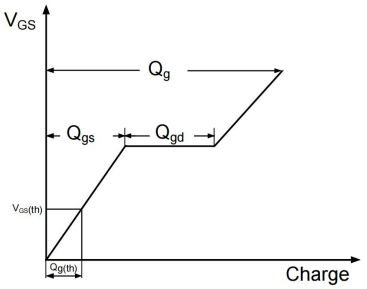
Normalized Threshold Voltage vs. Junction Temperature



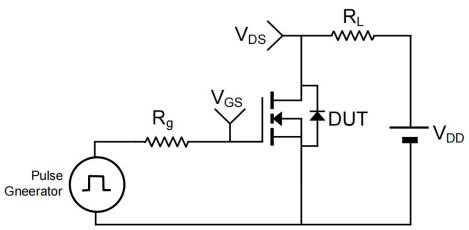
Test Circuit And Waveforms

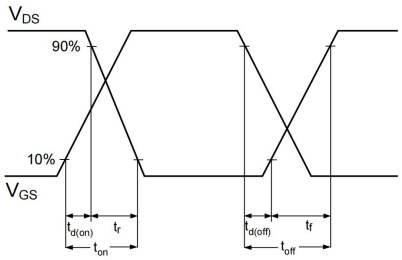
Gate Charge



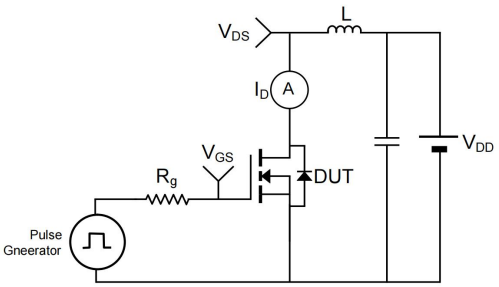


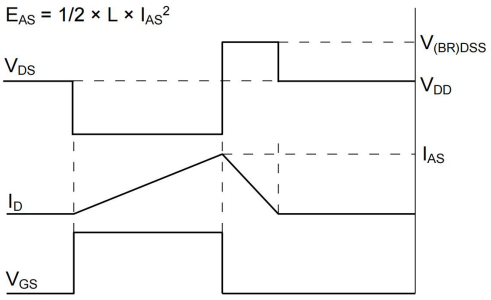
Resistive Load Switching Time



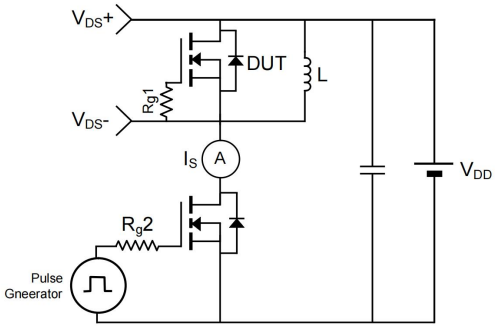


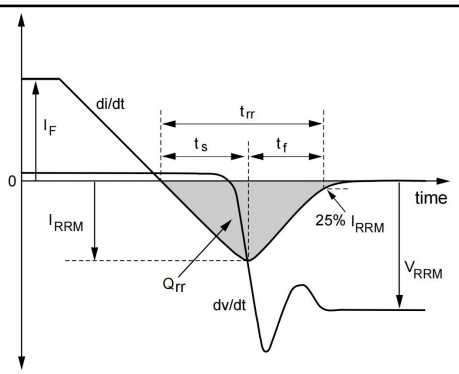
Un-clamped Inductive Load Switching



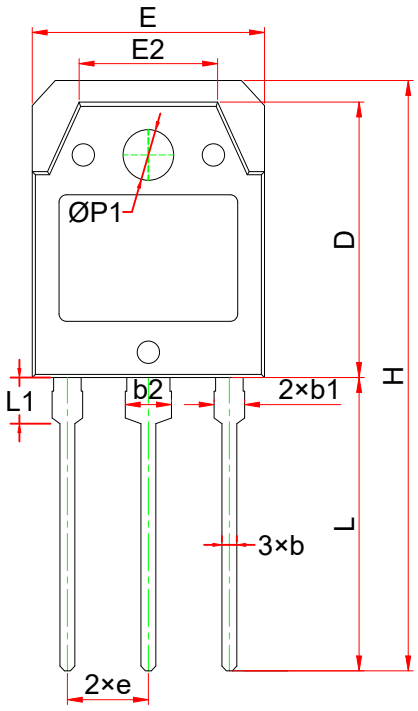


Drain-Source Body Diode Reverse Recovery

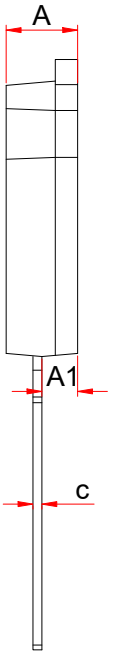




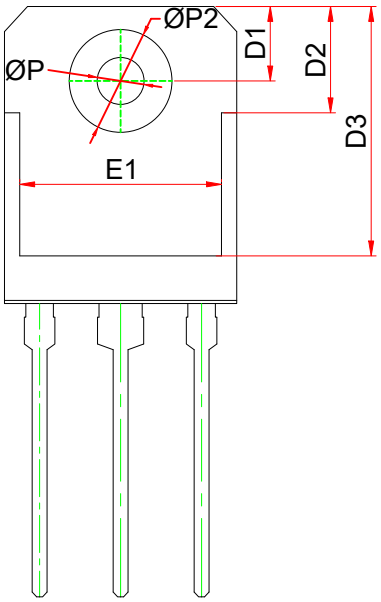
TO-3PN PACKAGE OUTLINE DIMENSIONS



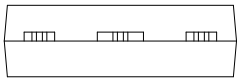
Top View
[顶视图]



Side View
[侧视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	4.65	4.95	0.183	0.195
A1	2.20	2.60	0.087	0.102
b	0.85	1.15	0.033	0.045
b1	1.90	2.20	0.075	0.087
b2	2.90	3.30	0.114	0.130
c	0.50	0.70	0.020	0.028
D	18.30	18.70	0.720	0.736
D1	4.80	5.20	0.189	0.205
D2	7.14 REF.		0.281 REF.	
D3	16.75 REF.		0.659 REF.	
E	15.40	15.80	0.606	0.622
E1	13.55 REF.		0.533 REF.	
E2	9.10	9.50	0.358	0.374
e	5.44 BSC.		0.214 BSC.	
H	39.35	39.95	1.549	1.573
L	19.40	20.00	0.764	0.787
L1	2.90	3.25	0.114	0.128
ΦP	3.00	3.30	0.118	0.130
ΦP1	3.25	3.55	0.128	0.140
ΦP2	6.70	7.10	0.264	0.280

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