

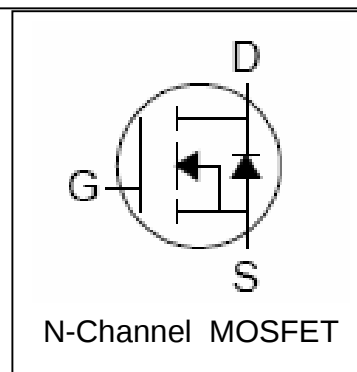
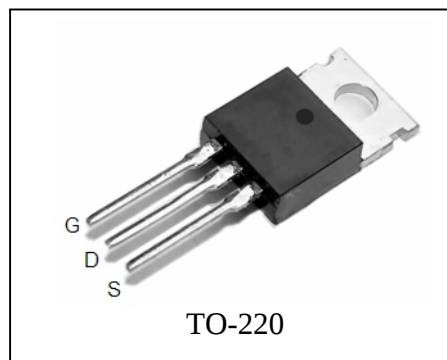
Features

- 55V/110A,
 $R_{DS(ON)} = 5m\Omega(\text{tpy.}) @ V_{GS} = 10V$
 $R_{DS(ON)} = 7m\Omega(\text{tpy.}) @ V_{GS} = 4.5V$
- Super High Dense Cell Design
- Ultra Low On-Resistance
- 100% avalanche tested
- Lead Free and Green Devices Available
 (RoHS Compliant)

Applications

- DC-DC Converters and Off-line UPS

Pin Description



Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _C =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		55	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		175	°C
T _{STG}	Storage Temperature Range		-55 to 175	°C
I _S	Diode Continuous Forward Current	T _C =25°C	110 ^①	A
Mounted on Large Heat Sink				
I _{DP}	300μs Pulse Drain Current Tested	T _C =25°C	420 ^②	A
I _D	Continuous Drain Current(V _{GS} =10V)	T _C =25°C	110 ^①	A
		T _C =100°C	88 ^①	
P _D	Maximum Power Dissipation	T _C =25°C	176	W
		T _C =100°C	88	W
R _{θJC}	Thermal Resistance-Junction to Case		0.85	°C/W
Drain-Source Avalanche Ratings				
E _{AS} ^③	Avalanche Energy, Single Pulsed		506	mJ

Electrical Characteristics (T_C=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RU55111R			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =250μA	55			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 55V, V _{GS} =0V			1	μA
		T _J =85°C			30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250μA	1	-	2.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
R _{DS(ON)} ④	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =55A		5	6.5	mΩ
		V _{GS} =4.5V, I _{DS} =35A		7	10	mΩ
Diode Characteristics						
V _{SD} ④	Diode Forward Voltage	I _{SD} =55A, V _{GS} =0V			1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =55A, dI _{SD} /dt=100A/μs		36		ns
Q _{rr}	Reverse Recovery Charge			62		nC
Dynamic Characteristics ⑤						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		1.6		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =30V, Frequency=1.0MHz		3670		pF
C _{oss}	Output Capacitance			380		
C _{rss}	Reverse Transfer Capacitance			185		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =30V, R _L =0.6Ω, I _{DS} =55A, V _{GEN} =10V, R _G =4.7Ω		33		ns
t _r	Turn-on Rise Time			24		
t _{d(OFF)}	Turn-off Delay Time			85		
t _f	Turn-off Fall Time			60		
Gate Charge Characteristics ⑤						
Q _g	Total Gate Charge	V _{DS} =44V, V _{GS} =10V, I _{DS} =55A		73		nC
Q _{gs}	Gate-Source Charge			19		
Q _{gd}	Gate-Drain Charge			25		

Notes: ① Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 75A.

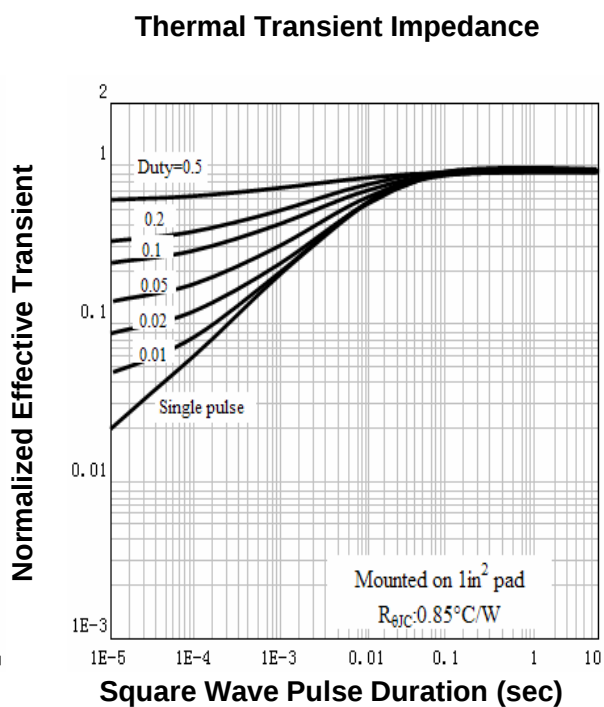
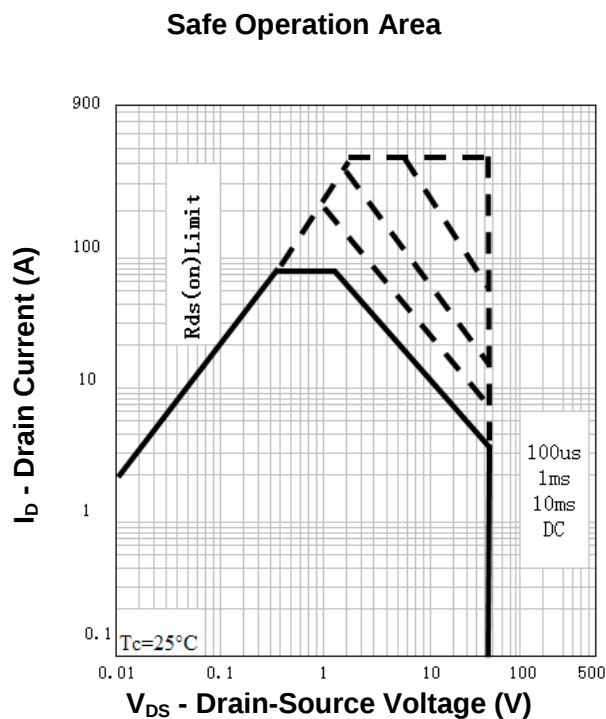
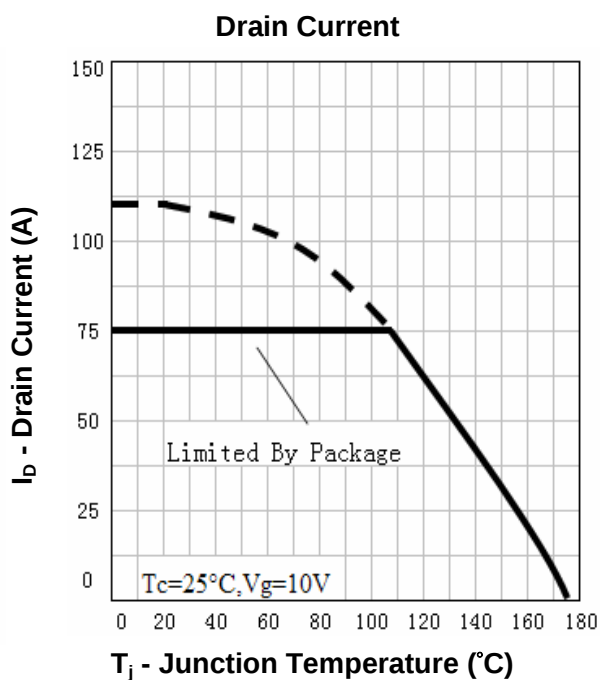
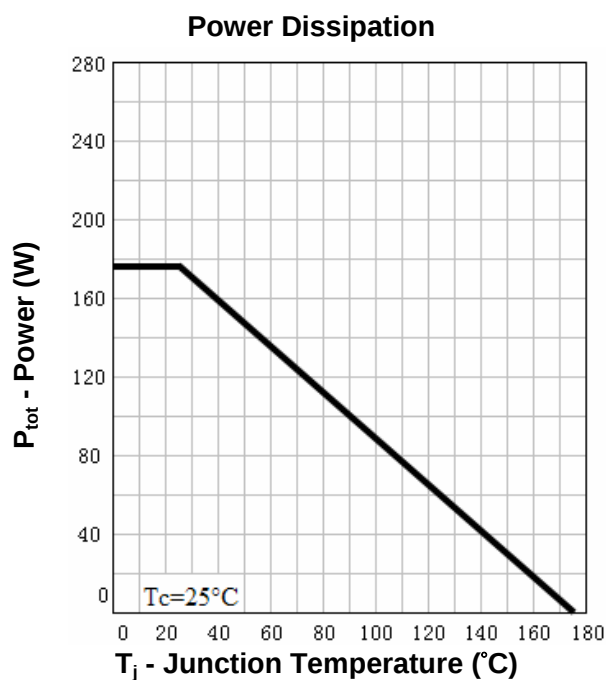
② Pulse width limited by safe operating area.

③ Limited by T_{Jmax}, I_{AS} =45A, V_{DD} = 48V, R_G = 50Ω, Starting T_J = 25°C.

④ Pulse test; Pulse width≤300μs, duty cycle≤2%.

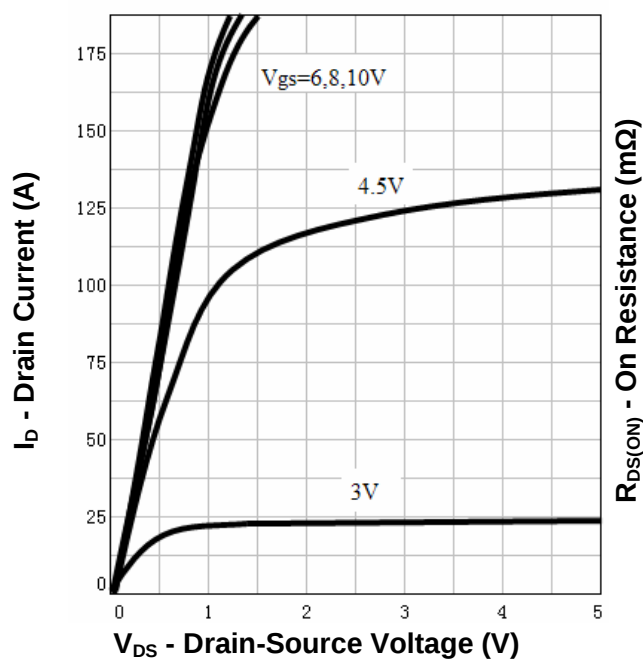
⑤ Guaranteed by design, not subject to production testing.

Typical Characteristics

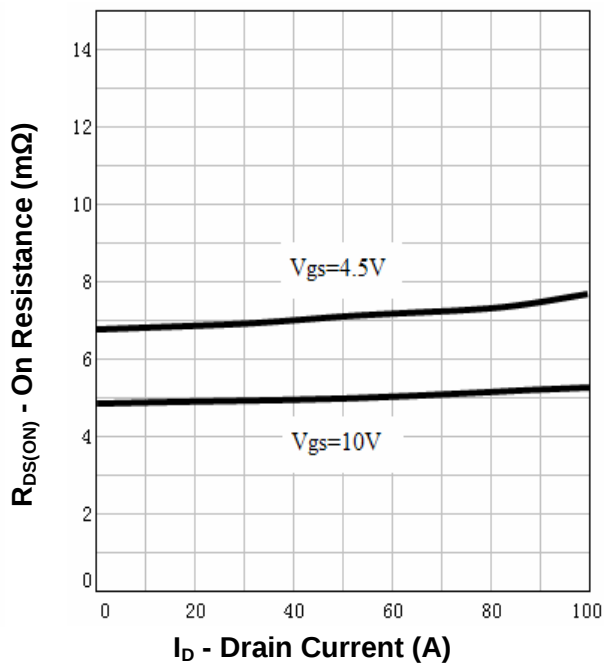


Typical Characteristics

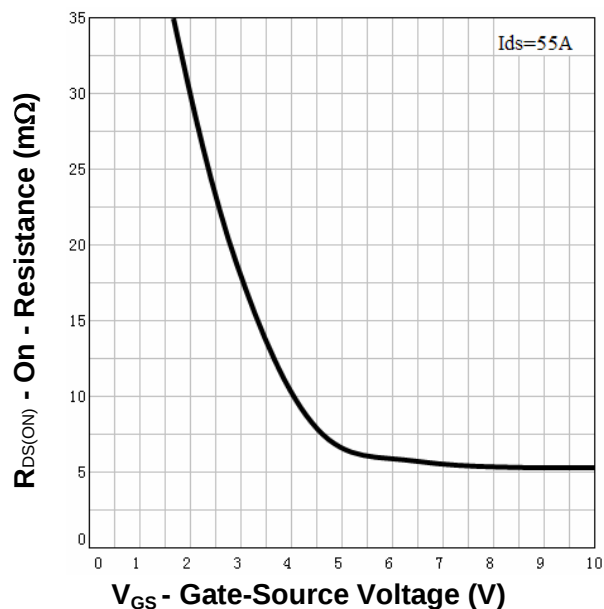
Output Characteristics



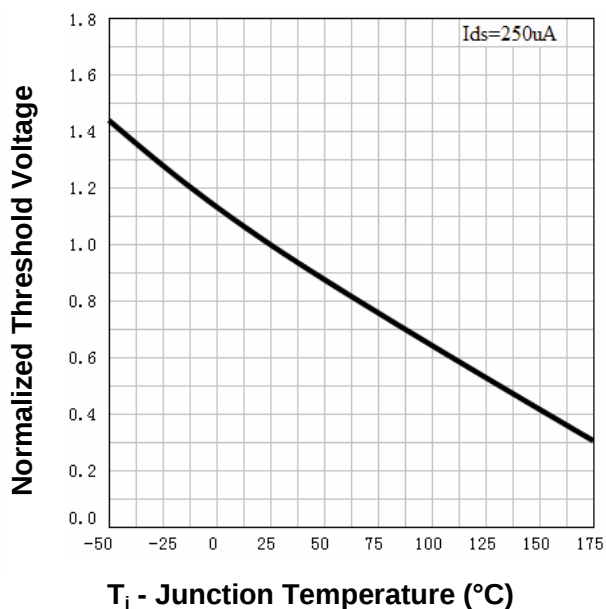
Drain-Source On Resistance



Drain-Source On Resistance

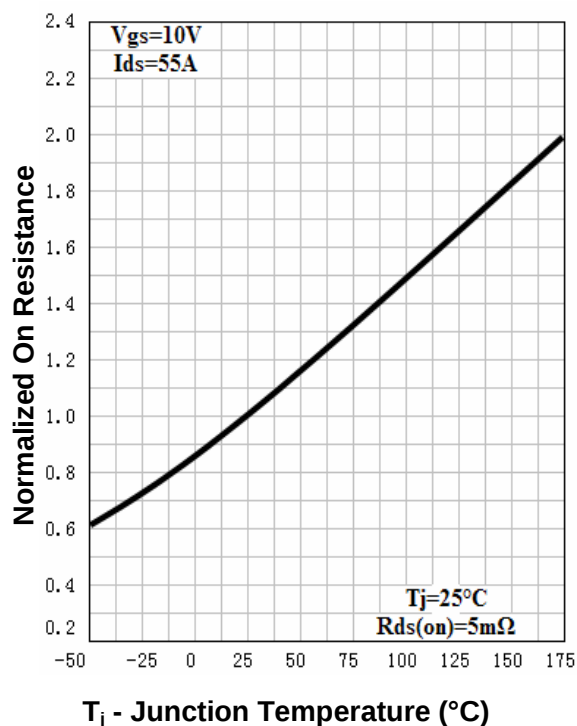


Gate Threshold Voltage

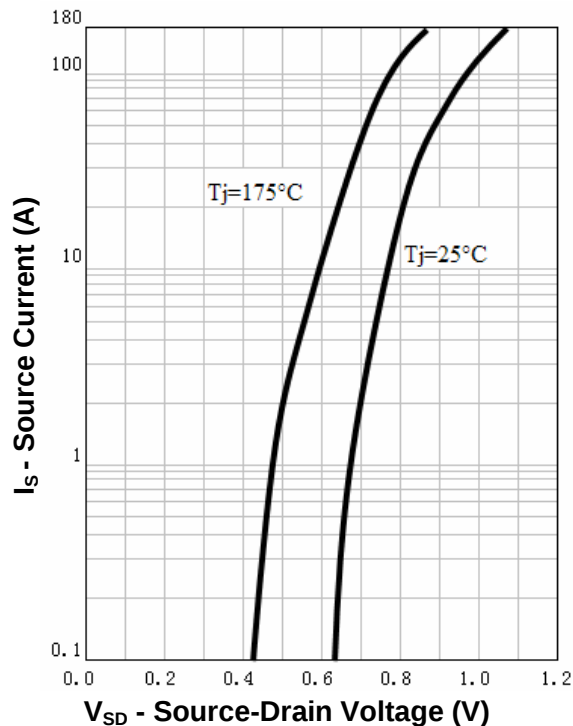


Typical Characteristics

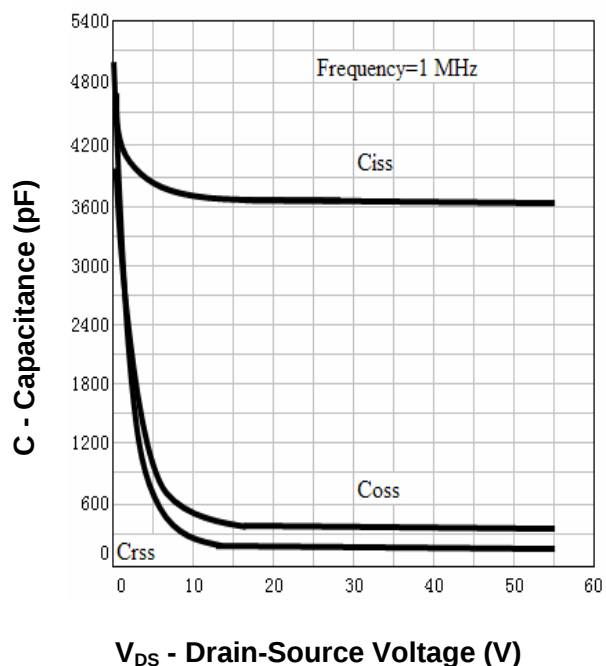
Drain-Source On Resistance



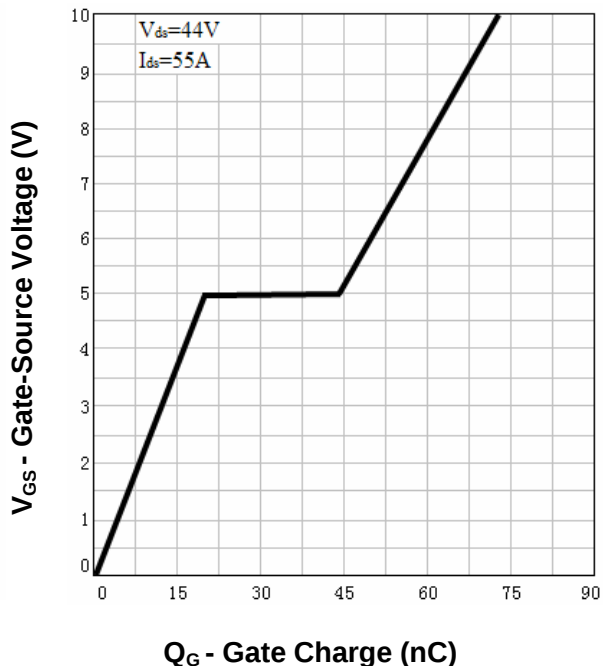
Source-Drain Diode Forward



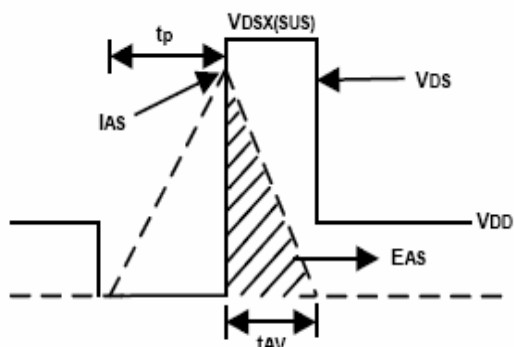
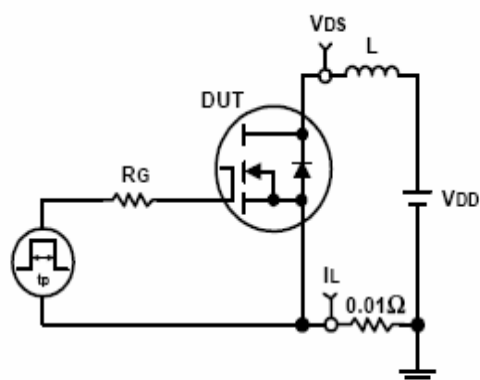
Capacitance



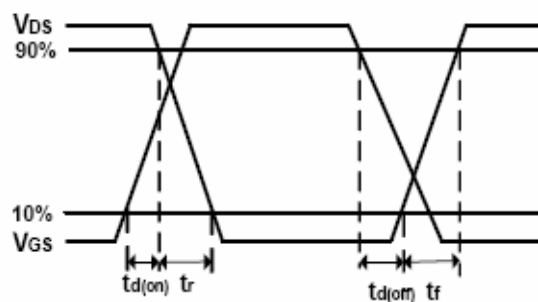
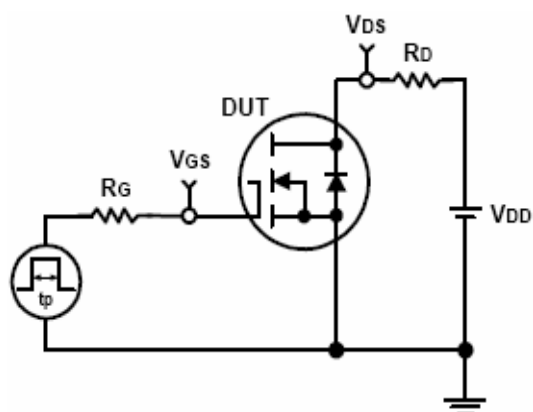
Gate Charge



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

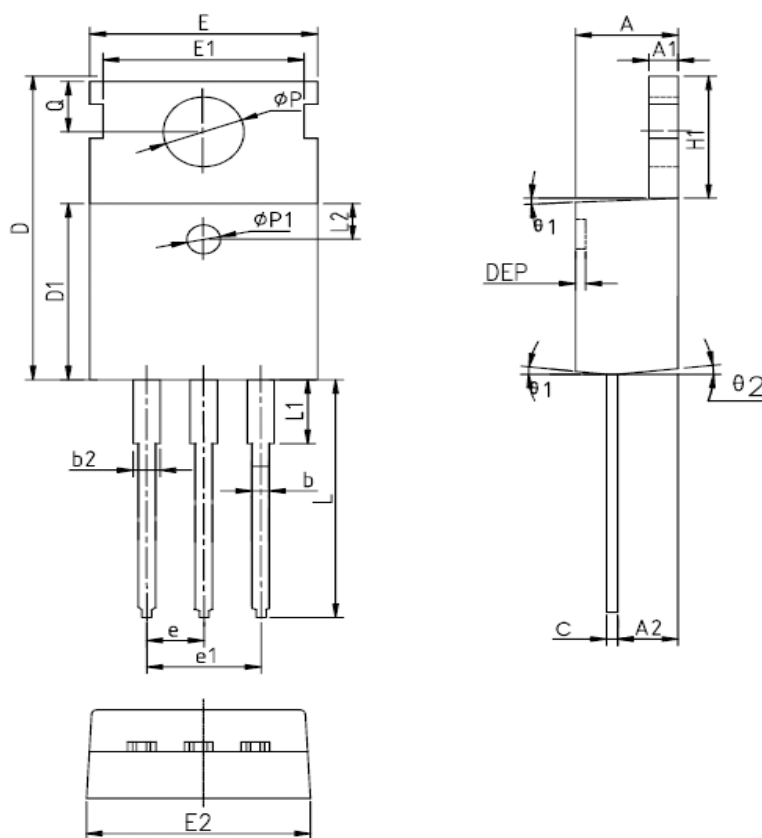


Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RU55111R	RU55111R	TO-220	Tube	50	-	-

Package Information

TO-220FB-3L



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.40	4.57	4.70	0.173	0.180	0.185	$\phi p1$	1.40	1.50	1.60	0.055	0.059	0.063
A1	1.27	1.30	1.33	0.050	0.051	0.052	e	2.54BSC			0.1BSC		
A2	2.35	2.40	2.50	0.093	0.094	0.098	e1	5.08BSC			0.2BSC		
b	0.77	-	0.90	0.030	-	0.035	H1	6.40	6.50	6.60	0.252	0.256	0.260
b2	1.23	-	1.36	0.048	-	0.054	L	12.75	-	13.17	0.502	-	0.519
C	0.48	0.50	0.52	0.019	0.020	0.021	L1	-	-	3.95	-	-	0.156
D	15.40	15.60	15.80	0.606	0.614	0.622	L2	2.50REF.			0.098REF.		
D1	9.00	9.10	9.20	0.354	0.358	0.362	ϕp	3.57	3.60	3.63	0.141	0.142	0.143
DEP	0.05	0.10	0.20	0.002	0.004	0.008	Q	2.73	2.80	2.87	0.107	0.110	0.113
E	9.70	9.90	10.10	0.382	0.389	0.398	$\theta 1$	5°	7°	9°	5°	7°	9°
E1	-	8.70	-	-	0.343	-	$\theta 2$	1°	3°	5°	1°	3°	5°
E2	9.80	10.00	10.20	0.386	0.394	0.401							

ALL DIMENSIONS REFER TO JEDEC STANDARD
DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS

Customer Service

Worldwide Sales and Service:

Sales@ruichips.com

Technical Support:

Technical@ruichips.com

Investor Relations Contacts:

Investor@ruichips.com

Marcom Contact:

Marcom@ruichips.com

Editorial Contact:

Editorial@ruichips.com

HR Contact:

HR@ruichips.com

Legal Contact:

Legal@ruichips.com

Shen Zhen RUICHIPS Semiconductor CO., LTD

Room 501, the 5floor An Tong Industrial Building,
NO.207 Mei Hua Road Fu Tian Area Shen Zhen City, CHINA

TEL: (86-755) 8311-5334

FAX: (86-755) 8311-4278

E-mail: Sales-SZ@ruichips.com