

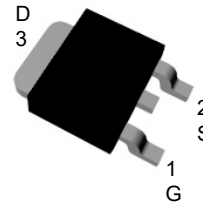
Features

- 30V/140A,
 $R_{DS(ON)} = 2.2m\Omega$ (typ.) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 3m\Omega$ (typ.) @ $V_{GS} = 4.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)

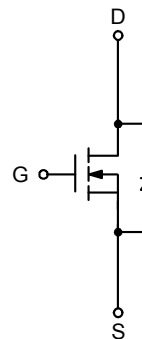
Applications

- Power Management in Desktop Computer or DC/DC Converters.

Pin Description



Top View of TO-252-2



N-Channel MOSFET

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T _A =25°C Unless Otherwise Noted)				
V _{DSS}	Drain-Source Voltage		30	V
V _{GSS}	Gate-Source Voltage		±20	
T _J	Maximum Junction Temperature		150	°C
T _{STG}	Storage Temperature Range		-55 to 150	
I _S	Diode Continuous Forward Current		140	A
I _{DP}	300μs Pulse Drain Current Tested	T _C =25°C	120	
		T _C =100°C	75	
I _D	Continuous Drain Current	T _C =25°C	140	
		T _C =100°C	86	
P _D	Maximum Power Dissipation	T _C =25°C	50	W
		T _C =100°C	20	
R _{θJC}	Thermal Resistance-Junction to Case	Steady State	2.5	°C/W
R _{θJA}	Thermal Resistance-Junction to Ambient	t ≤ 10s	20	
		Steady State	50	
I _{AS} ^a	Avalanche Current, Single pulse (L=0.5mH)		40	A
E _{AS} ^a	Drain-Source Avalanche Energy (L=0.5mH)		400	mJ

Note a : UIS tested and pulse width limited by maximum junction temperature 150°C (initial temperature $T_J=25^{\circ}\text{C}$).

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{\text{GS}}=0\text{V}$, $I_{\text{DS}}=250\mu\text{A}$	30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{\text{DS}}=24\text{V}$, $V_{\text{GS}}=0\text{V}$	-	-	1	μA
		$T_J=85^{\circ}\text{C}$	-	-	30	
$V_{\text{GS(th)}}$	Gate Threshold Voltage	$V_{\text{DS}}=V_{\text{GS}}$, $I_{\text{DS}}=250\mu\text{A}$	1.5	1.8	2.5	V
I_{GSS}	Gate Leakage Current	$V_{\text{GS}}=\pm 20\text{V}$, $V_{\text{DS}}=0\text{V}$	-	-	± 100	nA
$R_{\text{DS(ON)}}^{\text{b}}$	Drain-Source On-state Resistance	$V_{\text{GS}}=10\text{V}$, $I_{\text{DS}}=30\text{A}$	-	2.2	3.5	m Ω
		$T_J=125^{\circ}\text{C}$	-	4.2	-	
		$V_{\text{GS}}=4.5\text{V}$, $I_{\text{DS}}=20\text{A}$	-	3	5.5	
Gfs	Forward Transconductance	$V_{\text{DS}}=5\text{V}$, $I_{\text{DS}}=20\text{A}$	-	36	-	S

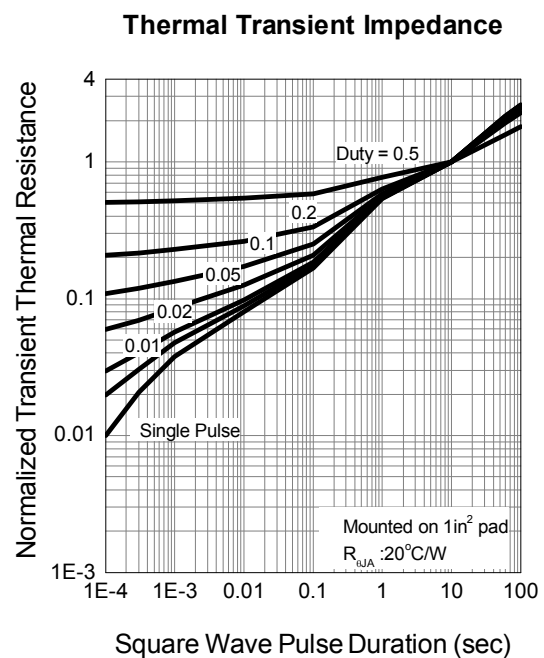
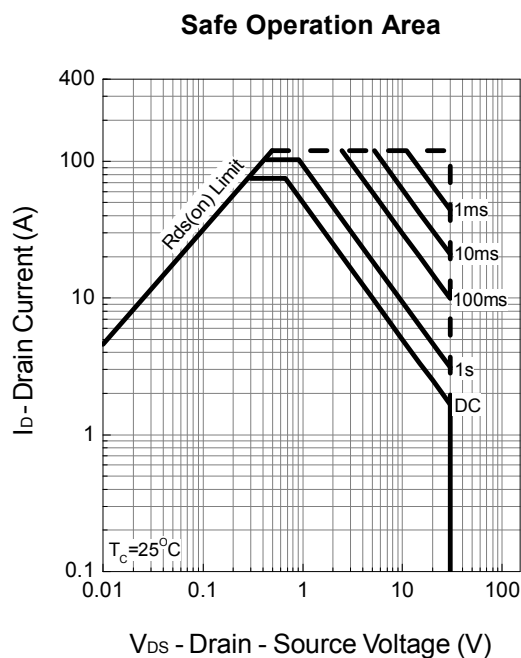
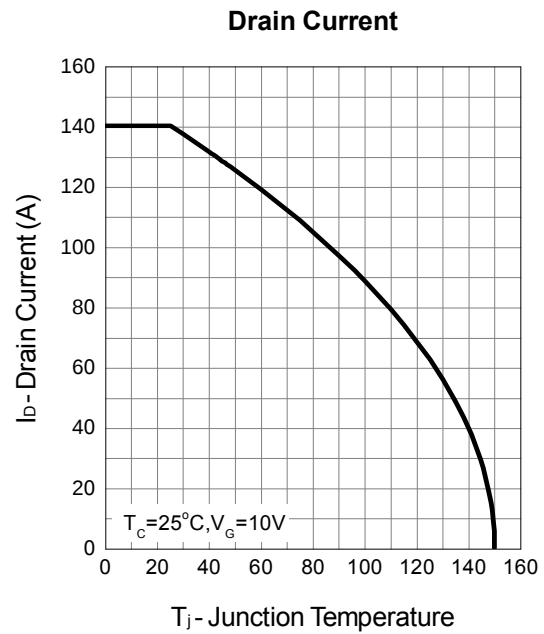
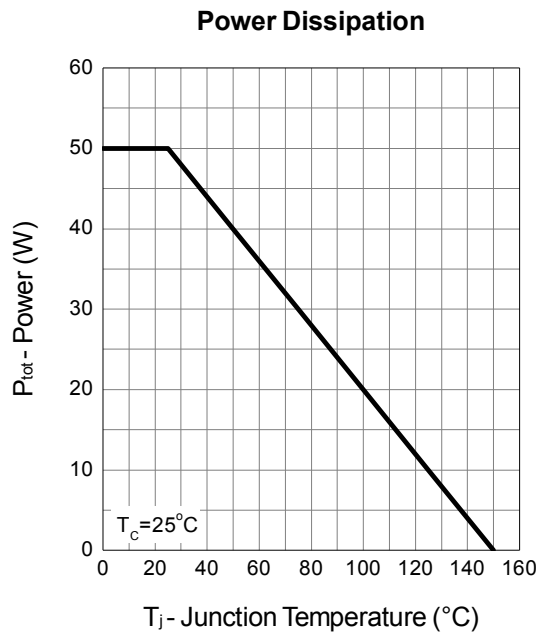
Electrical Characteristics (Cont.) (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Diode Characteristics						
V _{SD} ^b	Diode Forward Voltage	I _{SD} =20A, V _{GS} =0V	-	0.8	1.1	V
t _{rr}	Reverse Recovery Time	I _{DS} =30A, dI _{SD} /dt=100A/μs	-	19.5	-	ns
t _a	Charge Time		-	11	-	
t _b	Discharge Time		-	8.5	-	
Q _{rr}	Reverse Recovery Charge		-	11	-	nC
Dynamic Characteristics ^c						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz	0.5	0.9	1.5	Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, Frequency=1.0MHz	-	2695	-	pF
C _{oss}	Output Capacitance		-	649	-	
C _{rss}	Reverse Transfer Capacitance		-	269	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =15V, R _L =15Ω, I _{DS} =1A, V _{GEN} =10V, R _G =6Ω	-	17	32	ns
t _r	Turn-on Rise Time		-	10	19	
t _{d(OFF)}	Turn-off Delay Time		-	44	80	
t _f	Turn-off Fall Time		-	16	30	
Gate Charge Characteristics ^c						
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =4.5V, I _{DS} =30A	-	17.5	24.5	nC
Q _g	Total Gate Charge	V _{DS} =15V, V _{GS} =10V, I _{DS} =30A	-	37	52	
Q _{gth}	Threshold Gate Charge		-	4.8	6.7	
Q _{gs}	Gate-Source Charge		-	5	7	
Q _{gd}	Gate-Drain Charge		-	8.5	12	

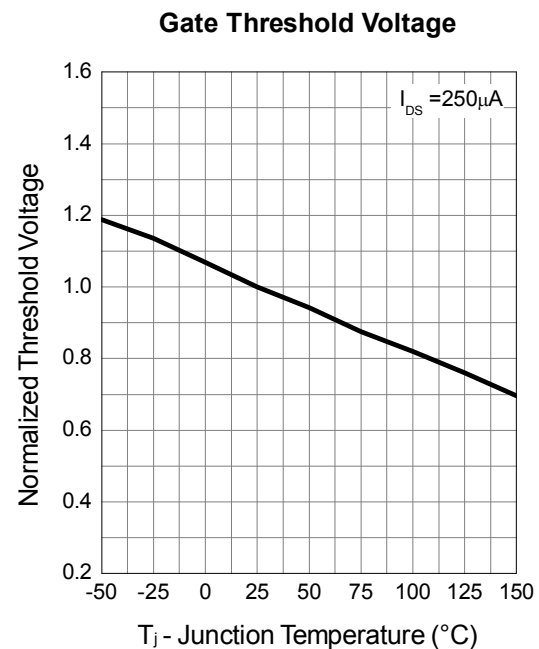
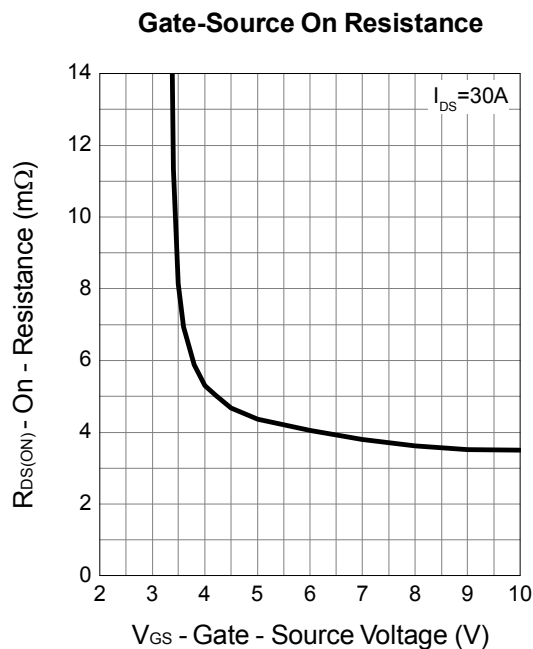
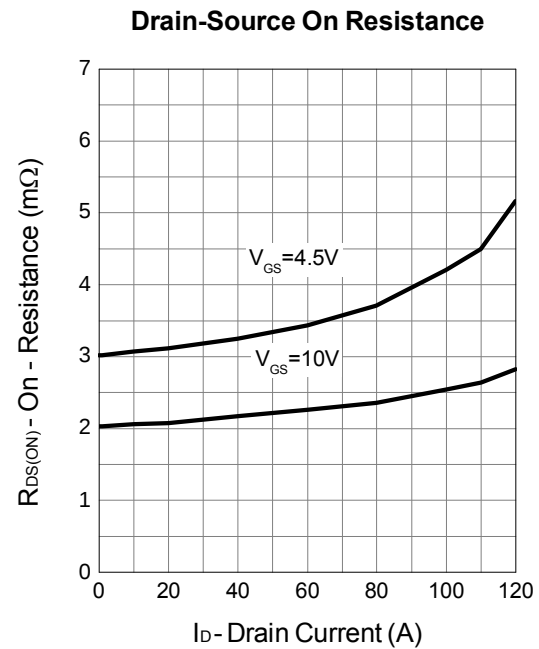
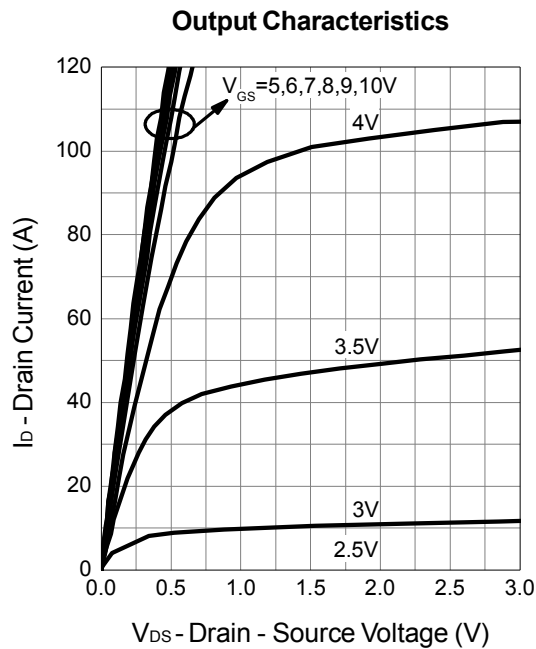
Note b : Pulse test ; pulse width≤300μs, duty cycle≤2%.

Note c : Guaranteed by design, not subject to production testing.

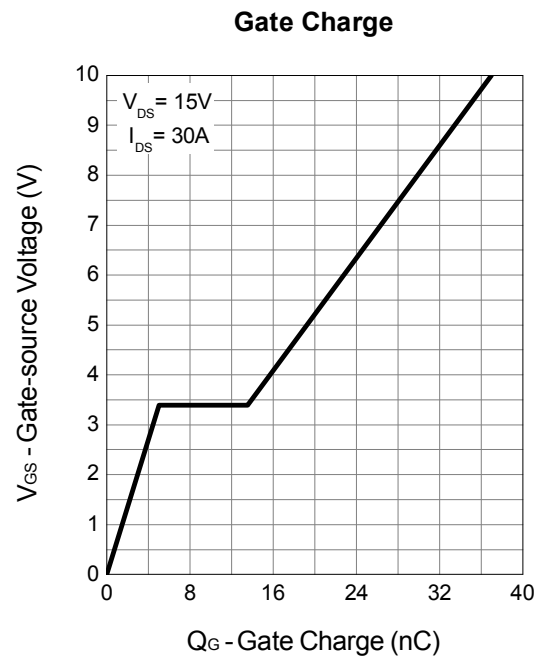
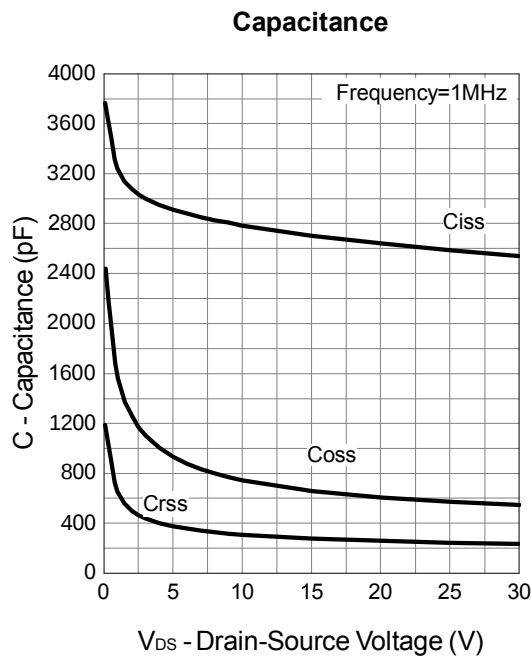
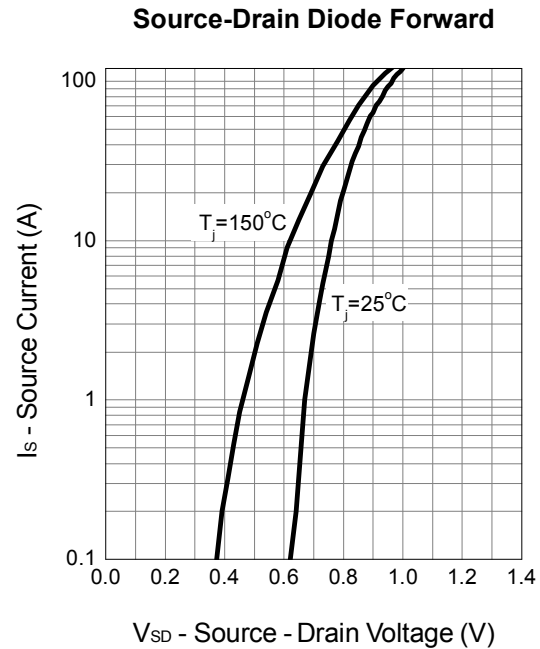
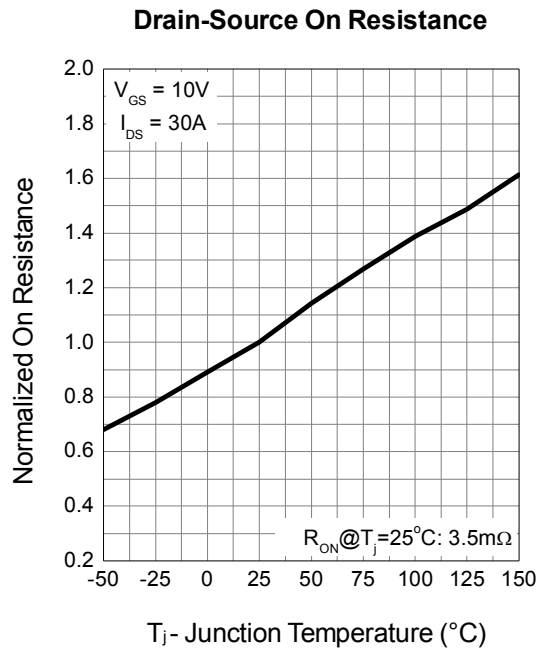
Typical Operating Characteristics



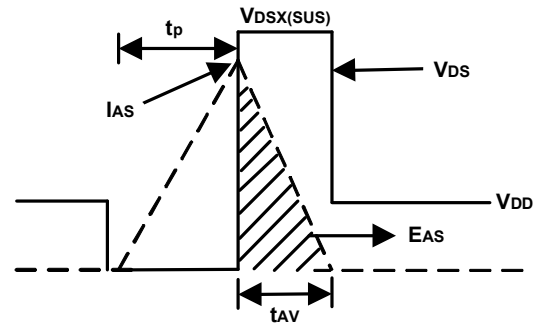
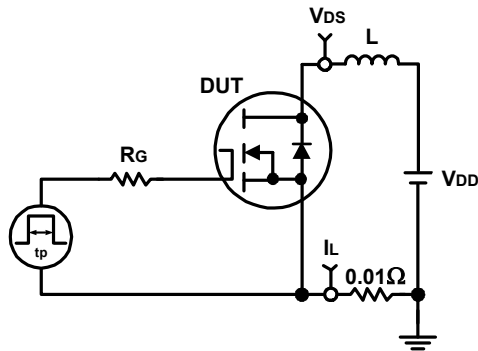
Typical Operating Characteristics (Cont.)



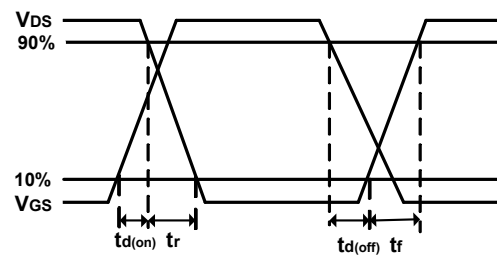
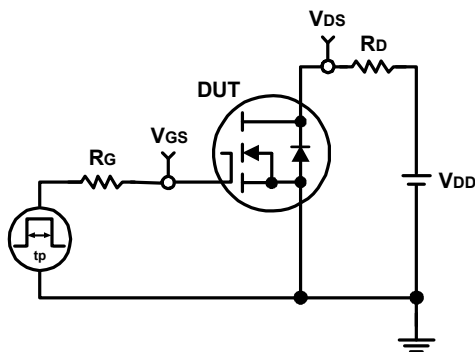
Typical Operating Characteristics (Cont.)



Avalanche Test Circuit and Waveforms

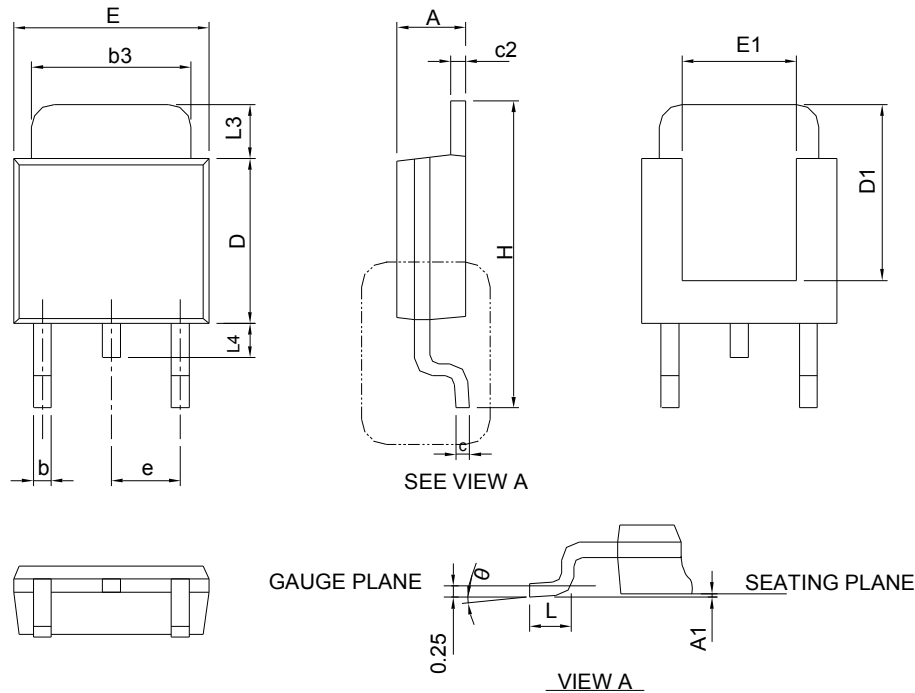


Switching Time Test Circuit and Waveforms



Package Information

TO-252-2



SYMBOL	TO-252-2			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.39	0.086	0.094
A1	-	0.13	-	0.005
b	0.50	0.89	0.020	0.035
b3	4.95	5.46	0.195	0.215
c	0.46	0.61	0.018	0.024
c2	0.46	0.89	0.018	0.035
D	5.33	6.22	0.210	0.245
D1	4.57	6.00	0.180	0.236
E	6.35	6.73	0.250	0.265
E1	3.81	6.00	0.150	0.236
e	2.29 BSC		0.090 BSC	
H	9.40	10.41	0.370	0.410
L	0.90	1.78	0.035	0.070
L3	0.89	2.03	0.035	0.080
L4	-	1.02	-	0.040
θ	0°	8°	0°	8°

Note : Follow JEDEC TO-252 .

RECOMMENDED LAND PATTERN

